



EW

ELEVATOR WORLD

May 2023

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Focus on Suspension Means and Materials

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3D printing in elevator manufacturing

Preserving the Past, Elevating the Future

A look inside The Elevator Museum

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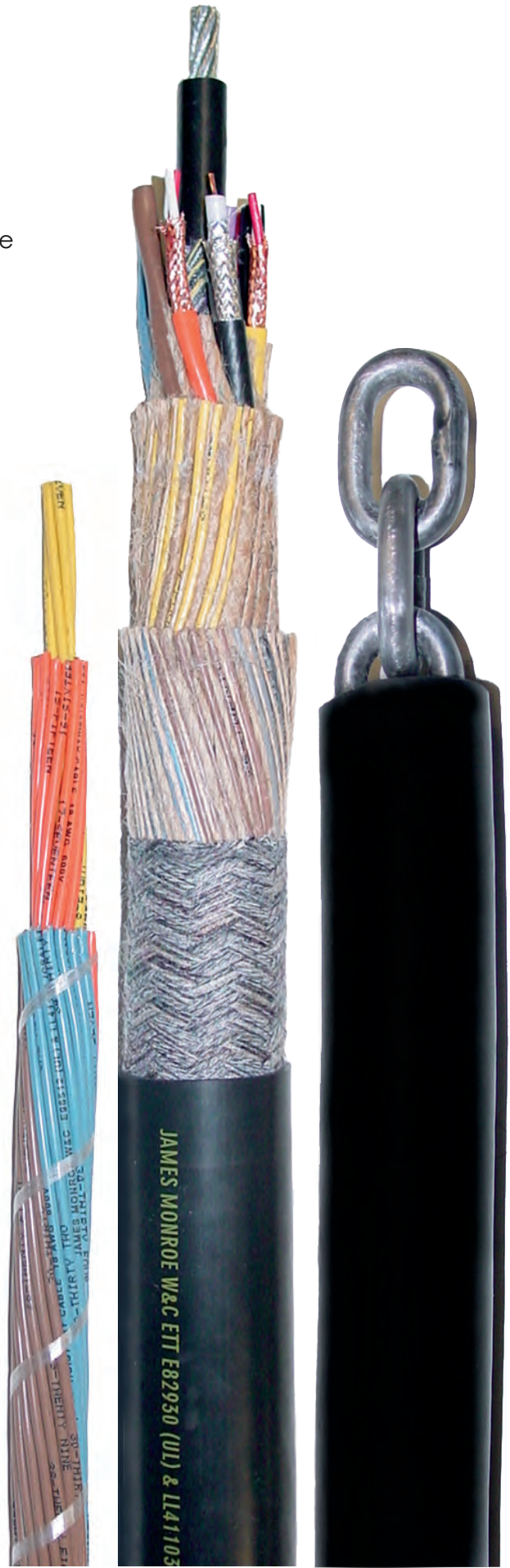
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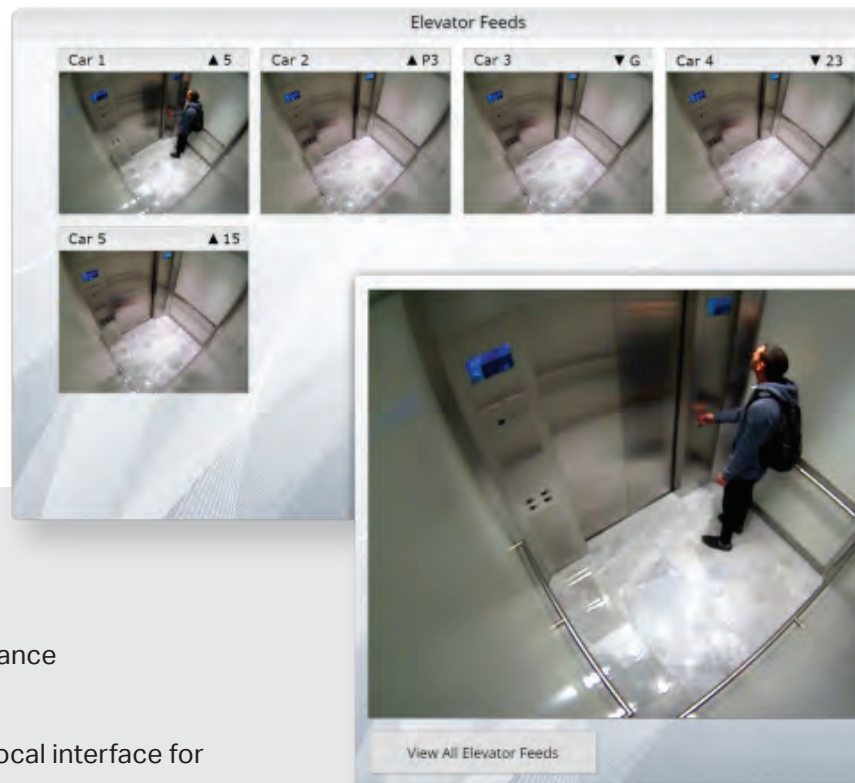
If a rider presses the emergency call button in an elevator but is unable to verbally respond, most monitoring stations simply hang up.

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How It Works

- ▶ MosaicONE monitors the phone/help button through a second contact
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- ▶ On-site security location can interact via a dedicated computer



Learn More About **MosaicONE VMS**

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The intelligent collection, management and distribution of information for the benefit of the industry, while providing a global marketing platform that expands the reach of the industry to all corners of the world.

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- www.elevatorjobsitesafety.com: Complete Safety Handbook PDF, plus current revisions, quizzes, safety products, toolbox meetings and links.
- www.elevatordirectory.com: A powerful online business directory, events calendar, classifieds section and more.

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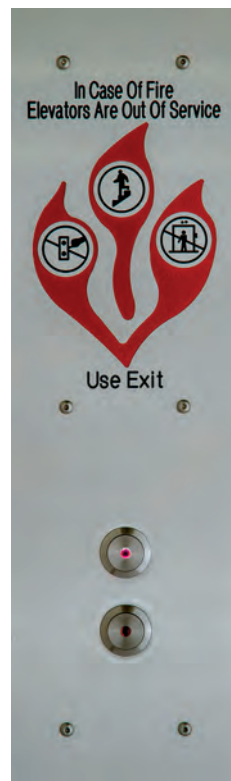
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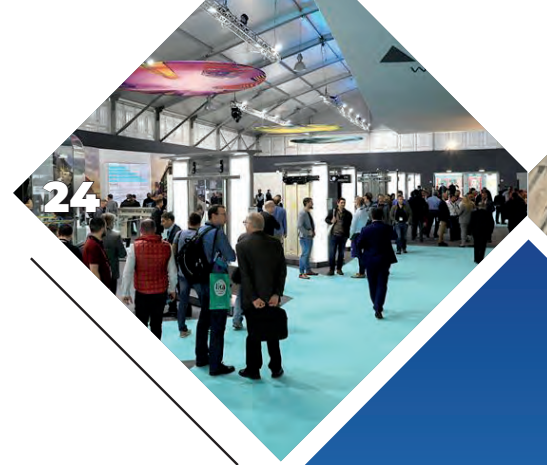
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Mostly Ups

by Ricia Sturgeon-Hendrick

A

s I write this column, the economy seems to be looking mostly upward. Cities that lost population during the pandemic are gaining it back, according to the Census Bureau. Many workers who could telecommute left the big cities for suburban or rural areas when COVID struck, causing businesses and builders to wonder whether it was a permanent shift. *The Washington Post* writes that, according to an analysis by Brookings Institution, 11 of the 15 largest U.S. metro areas gained residents compared with the previous year, including the Washington, D.C., metro area, NYC, the San Francisco Bay Area and Seattle.

In more good news, construction employment increased in 45 states in the first quarter of 2023 compared with a year ago, according to Associated General Contractors of America. Texas saw the largest number of jobs added, increasing by 37,900, or 5%, from 2022 to 2023. Commercial planning in February was bolstered by almost 20% growth in office planning activity, as data centers continued to steadily enter the planning queue. Institutional planning was driven higher by growth in education and healthcare projects.

There are a few “downs” – the price of gas is rising; inflation is stubborn; and some builders are dragging their feet. Rising interest rates are not just hurting banks; five to 10 office towers a month join the list of properties at risk of defaulting because of low occupancy, expiring leases or maturing debt that would have to be refinanced at a higher rate. Despite continued rumblings of recession, of surveyed civil contractors, 26% expect a significant increase in revenue, and 14% expect a significant increase in profit margins within the next 12 months, according to the Dodge report.

This month our focus is on **Suspension Means and Materials**, and we have two articles, plus a Continuing Education (CE) offering.

- ◆ **PU-Coated Ropes as Elevator Suspension Means** by Nicola Imbimbo. Small diameter polyurethane-coated (PU) ropes can make a great difference as they allow for reduced traction sheave diameter and machine size.



- ◆ **Vertical Transportation Space Era: From Science-Fiction to Viable Engineering Solution and an Emerging Market** by Yuval Valiano-Rips and Maya Glickman-Pariente. A fascinating article that is a call to action for vertical-transportation (VT) engineers who will see future demand for VT in extraterrestrial places, i.e., the moon, Mars or space stations.
- ◆ The CE is **A Versatile Solution** by Pat Dreps and Joseph Thompson. The authors detail that PU-coated ropes are a high-performance rope with different traction results – plus, it is a lifetime decision. Four feature articles are in this issue:
- ◆ **WOW** by Olga Quintanilla Marful, EW Correspondent in Spain. TK Elevator provides accessibility to a new WOW Concept Shopping Center, transforming the old Hotel Roma in Madrid, Spain.
- ◆ **“Is There Even More?”** by Undine Stricker-Berghoff, EW Correspondent in Germany. She interviews Oliver Simmonds, principal engineer at Schindler who expounds on how 3D printing will be used in the elevator industry. He asks, “Is it art or manufacturing?”
- ◆ **Preserving The Past, Elevating the Future** by Lindsay Fletcher. It has been a great honor to visit The Elevator Museum Inc. in Amesbury, Massachusetts. Founder Steve Comley is a one-man dynamo who finally accomplished what many before him have tried – saving much of the beautiful, rare equipment in our industry.
- ◆ **Double-Deck Deep Dive** by Kaija Wilkinson, with photos by David Fried. Citycorp Center, known by its address, 601 Lexington Avenue, is celebrating 45 years with some new double-deck elevators, a novelty even in NYC. VDA and Otis, who are doing the mod job, have some stories to tell about the original installation.

It is a packed issue: NEII talks safety, including the *Safety Handbook* revisions; and Dr. Lee Gray talks about the year 1973, when EW wrote about a new government agency, OSHA, and published the first *Safety Handbook*. We have product and project reviews, plus interviews with folks you know. There is just so much more, but I “runneth” out of space and time. Enjoy! 🌍

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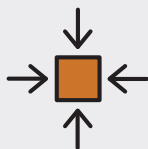


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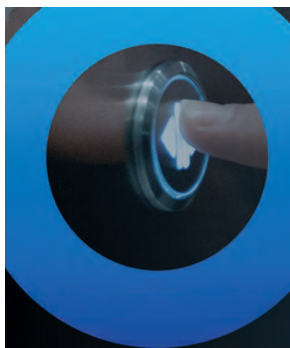
2023

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|---------------------|---|---|
| JUN 13-16 | CECA 2023 Halifax, Nova Scotia, Canada ceca-acea.org |  |
| 20-23 | Elevcon Prague, Czech Republic elevcon.com |  |
| 26-29 | Elevator U Charlotte, North Carolina elevatoru.org |  |
| JUL 5-8 | WEE Expo Shanghai, China elevator-expo.com |  |
| AUG 22-24 | Global Lift & Escalator Expo Africa Johannesburg, South Africa www.gleexpo.com |  |
| SEP 4-7 | Lift City Expo Jeddah Jeddah, Saudi Arabia www.liftcityexpo.com |  |
| 10-13 | NAEC 74th Annual Convention and Exposition Reno, Nevada www.naeconvention.com |  |
| 20-21 | 14th Lift & Escalator Technologies Symposium Northampton, U.K. liftsymposium.org |  |
| 21 | UK Lift Industry Golf Day Bedfordshire, U.K. kapok88.com |  |
| 21-22 | Wisconsin Elevator Symposium Lake Geneva, Wisconsin naesai.org |  |
| 25 | Pop/Joe Golf Outing Old Brookville, New York eesf.org |  |
| OCT 11-12 | Chicago Build 2023 Chicago, Illinois chicagobuildexpo.com |  |

| | | |
|-------------|--|---|
| 16-21 | CTBUH International Conference Marina Bay Sands, Singapore & Kuala Lumpur, Malaysia ctbuh.org |  |
| 17-20 | Interlift 2023 Augsburg, Germany www.interlift.de |  |
| NOV 8-10 | International Lift Expo Korea Seoul, South Korea www.liftexpokorea.com |  |
| 15-17 | Global Elevator Exhibition Milan, Italy www.geemilano.com |  |
| DEC 5-6 | International Elevator & Escalator Symposium Edinburgh, Scotland elevatorsymposium.org |  |
| 7-9 | Vietnam Elevator Expo Ho Chi Minh City, Vietnam elevatorexpo.com.vn |  |



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|---------------------|--|---|
| 2024 MAY 9-11 | Inelex 2024 & Izmir Lift Symposium Izmir, Türkiye www.inelex.com |  |
| SEP 16-18 | The Elevator Show Dubai, U.A.E. elevatorshowdubai.com |  |
| DEC 5-7 | International Sourcing Exposition for Elevators and Escalators Mumbai, India tak-expo.net |  |



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REGIONAL MEETINGS AND EVENTS

Canadian Elevator Contractors Association (CECA)

Central Region

Meetings are held the first Thursday in February, April, October and December. Contact CECA at phone: 905-446-0327, email: office@ceca-acee.org or website: www.ceca-acee.org.

CECA Eastern and Western Regions

Four meetings per year on an as-needed basis. Contact CECA at phone: 905-446-0327, email: office@ceca-acee.org or website: www.ceca-acee.org.

Chicago Elevator Association (CEA)

First Thursday of each month, September-June (no meetings during July and August). Contact Tom Przybyla at phone: 708-876-4002 or fax: 708-867-5467.

Elevator Association of Florida

Meetings are held on the second Tuesday of January, April, July and October. Contact Treasurer Lee Rigby at phone: 850-294-1070, fax: 850-210-0085, email: elevatorlee@aol.com.

Elevator Association of Minnesota (EAM)

September, December, spring and a June golf outing. Contact EAM at phone: 507-245-4269.

Elevator Conference of New York (ECNY) Dates to be announced on the ECNY website. Contact ECNY at email: info@ecny.com or website: www.ecnyweb.com.

International Association of Elevator Consultants – New York (IAEC-New York Region)

Meets quarterly in March, June, September and December on the second Tuesday in NYC. Contact Joe Neto, Jr. at email: jneto@josephneto.com.

Massachusetts Elevator Safety Association (MESA)

Meetings are held on the second Tuesday of each month (except July and August) at Jake n JOES Sports Grille on Route 1 in Norwood, Massachusetts. Contact President Roland Locke at phone: 774-634-7249, email: masselevatorsafetyassoc@gmail.com or website: www.mesassoc.com.

An expanded calendar with associated industry events is available at website: www.elevatordirectory.com/event.

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A Trip Down Memory Lane

I found some ELEVATOR WORLD articles from the 1950s about and by my father, William Lamps Sr. One, from 1953, is about his starting and growing his elevator business, Lamps Elevator Sales & Service Co. in Rockford, Illinois, and the others are about his being elected president of the National Association of Elevator Contractors (NAEC) in 1954 and a report authored by him about the German elevator industry that appeared in the October 1955 issue. (EW founder William C.) Sturgeon was a great guy. I met him at NAEC in Jacksonville, Florida, one year in the 1950s. I made sandwiches for the fellows and helped serve coffee and water and, at the end of the day, my dad was happy with me! Wow!

I was drafted into the U.S. Army in 1967. When I came home, I went to work for Lamps Elevator as a helper on construction and service projects. The office manager, my cousin Rudy Lamps, had also worked for Montgomery Elevator (the Rockford operations of which were acquired by my father in 1942 to launch his business) as an electronic troubleshooter on construction projects. He died of a heart attack in Arizona in 2021. My dad died of a stroke in 1988.

Say hi to everyone at EW. I would be surprised if anyone remembers me. I called there and talked to some of the girls in the office about our subscription, and they were very polite and efficient. Congratulations on EW's 70th anniversary!

*William "Bill" Lamps Jr.
Rockford, Illinois
leebilly@aol.com*

Editor's Note: This message was originally sent to EW President T. Bruce MacKinnon. Further research revealed much more about Bill Lamps Sr. in the early pages of our magazine, including various positions he held at NAEC, a visit from a Filipino colleague that required special authorization from the U.S. State Department, Lamps' tours of Germany and Russia, Montgomery Elevator congratulating him on 50 years in the industry and even a comment from a 1966 issue in which Lamps congratulated EW on going from "only a dream" to the premier international elevator publication.

Seeking Information About 100-Year-Old Haughton Elevator

We have a 100-year-old Haughton elevator and are trying to track down original electric schematics and layout information. We have tried numerous companies and turned up nothing. If any readers could provide any help, feel free to contact me.

*Ryan Kosch
Pontiac, Michigan
r3kosch@gmail.com*



Lamps Elevator Sales and Service on the cover of the EW June 1953 issue



Bill Lamps Sr. inspects a duplex elevator installation in Hamburg, Germany (EW October 1955).



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NY Build Picks Up Steam as Go-To Event

The New York Build Expo (NY Build) picked up steam as the go-to event at the beginning of the calendar year on March 8-9 at the Javits Center in Hell’s Kitchen. Under the theme, “Women in Construction,” more than 20,000 attended the tradeshow, billed as “the leading construction and design show for New York.” Several elevator-related companies, both OEMs and independents, hosted booths. This year’s NY Build featured more than 300 speakers and more than 300 exhibitors. The next NY Build is planned on March 6-7, 2024, again at the Javits Center. — reported by Matthew Jackson



Schindler was among the OEMs to host a booth. (l-r) are Corinne Schmidt and Kristin Collins.



Liberty Elevator team members talk to visitors.

LCD Provides Elevator System for New Upper East Side Tower

Mineola, NY-headquartered LCD Elevator Repair, Inc. provided three elevators for 249 East 62nd Street, a 28-story residential tower on Manhattan’s Upper East Side scheduled for completion later this year. LCD Project Manager David Regiec tells ELEVATOR WORLD the system includes two Hollister-Whitney, overhead traction, inline elevators making up to 28 stops with Hollister-Whitney machines traveling at 500 ft/min. One elevator has 3500-lb capacity and the other, 2000-lb capacity. There is also one MEI holeless hydraulic elevator traveling at 125 ft/min making two stops with 4000-lb capacity. Additional suppliers included:

- ◆ EDI-ECI, entrances and cabs
- ◆ Monitor, fixtures

Continued



In March, the final set of balconies along the northern corner of the tower on 249 East 62nd Street was yet to be built, and will probably have to wait for the construction elevator to be disassembled; photo by Michael Young for New York YIMBY.

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◆ Motion Control Engineering, controllers

In March, *New York YIMBY* reported that installation of 249 East 62nd Street’s light-colored terracotta façade was well underway. The property was designed by INC Architecture & Design with SLCE Architects as executive architect for developer Zeckendorf Development. With CM & Associates serving as general contractor, the tower will provide 66 condominium units, cantilevering balconies and an array of amenities.

TEI VT Package for New Multi-Tower Bronx Property

TEI Group, headquartered in Long Island City, tells EW it provided a 14-unit vertical-transportation (VT) package for Bankside, a three-tower, 25-story residential development designed by Hill West Architects for developer Brookfield at 101 Lincoln Avenue in Mott Haven, the Bronx. The property is served by 14 VT devices: three elevators for the east tower, two elevators for the north tower, four elevators for the west tower and two elevators, two hydraulic auto lifts and one Americans with Disabilities Act-compliant lift for the south tower. In February, *New York YIMBY* reported the affordable housing lottery had launched for Bankside for 145 of its 921 residences. Its amenities include an attended lobby, dog-washing station, business center, children’s playroom, rooftop terrace, pool, fitness center and electric-vehicle charging stations.



Rooftop terrace at Bankside; image courtesy of NYC Housing Connect

Co-Op City Modernization Team Celebrates Completion

Lauren Rios, president of Bethpage, New York-headquartered United Vertical Group (UVG), was among those to announce the completion of a 160-elevator modernization at Co-Op City in the Bronx (EW, March 2020) in March. UVG worked alongside project partners DTM Drafting & Consulting Services, Inc., Champion Elevator Corp. and Triumph Electrical Supply over the past three years on the project, which Rios described as “an incredible journey.” The job was originally awarded to United Cabs, Rios said, but in 2022 United Cabs partnered with UVG for the work. Described as a “city within a city,” Co-Op City is home to approximately 44,000 residents. “This incredible accomplishment would not have been possible without our team’s outstanding leadership, hard work and dedication,” Rios said.



The UVG modernization team celebrates project completion; photo courtesy of UVG.



Detail of a modernized cab interior; photo courtesy of UVG

Metro Elevator Creates “Special Elevator” for New Gucci Store

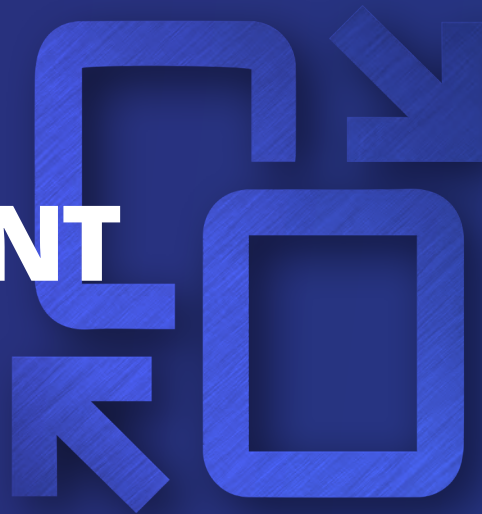
Metro Elevator recently delivered what company President Ryan Kraven described as a “special elevator” to the new Gucci store in the Meatpacking District. “Metro was able to navigate supply-chain and design issues and beat the clock for the opening,” Kraven said. The glass and mirrored interior was provided by CEC Elevator Cab Corp., with Metro’s Winans Largacha, Matt McQuillen and Joseph Abbate overseeing the work. The elevator is a two-stop, hydraulic unit traveling at 100 ft/min with 3500-lb capacity. It has an MEI-Total Elevator Solutions hydraulic package and an EC Pixel controller, which is

Continued



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The new Gucci store at 446 West 14th Street; photo courtesy of Ryan Kraven



Glassed and mirrored interior; photo courtesy of Ryan Kraven

In Memoriam: David Schuyler Herres




David Schuler Herres of Clarksville, New Hampshire, a longtime ELEVATOR WORLD contributor and author, passed away on November 12, 2022, after a long illness. A New Hampshire master electrician with a degree

in literature from Hobart and William Smith Colleges in Geneva, New York, Herres wrote scores of continuing education articles for EW until shortly before his passing. He authored the book, "Elevator Troubleshooting & Repair." A native of Boston, Herres worked as a journalist in NYC after college graduation. He met his late wife, Valerie, at Hobart and William Smith, and the pair shared a son, Albion, and daughter, Ajilla, who both survive them. Herres was known for his intelligence and fascination with science, building, politics and literature. Later in life, he enjoyed traveling and living part time in Florida with his long-term partner, Judy Howcroft, who is also among his survivors. Herres also leaves behind four grandchildren, Allison, Ashton, Kyle and Lily; a brother, Donald; and a sister, Abigail.

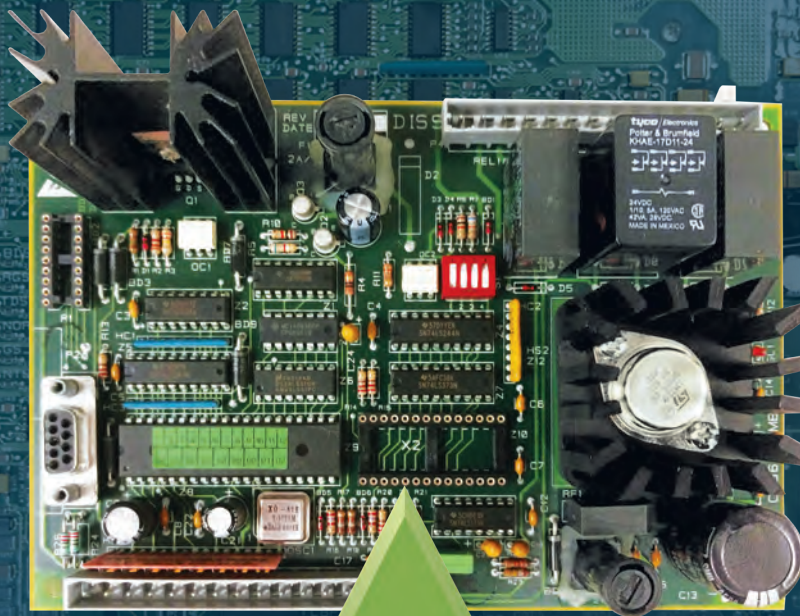
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Business

Transitions and an acquisition



Joyce

Vantage Appoints Two Sales Team Leaders

Vantage Elevation, headquartered in Bronx, NY, recently appointed two key members to its sales team: Jim Joyce as territory sales manager for New England and Mark Guzman as director of sales operations for GAL Manufacturing. Reporting directly to Vantage Northeast Regional Sales Manager Joseph Moloney, Joyce is focused on growing Vantage's footprint in the Northeast by offering complete packaged solutions, parts and services supporting Vantage's new Northeast Regional Service Center in Astoria, Queens, NY (ELEVATOR WORLD, February 2022). Joyce has 10 years' elevator industry experience, starting at TK Elevator as an account manager and working his

way up to key management roles including modernization sales manager. His experience includes a position as an elevator consultant at VTX and, most recently, a district sales manager for 3Phase Elevator Corp. in New England.

Reporting to Vantage Director of Inside Sales Greg Zuckett, Guzman is overseeing GAL's estimating/sales engineering, parts sales and customer service teams. A native New Yorker who lives in Queens, Guzman most recently led a sales and support team at Actigraph, a leading provider of medical-grade wearable technology for the global scientific community. At Actigraph, he was instrumental in creating and implementing well-defined processes for lead management, order processing and fulfillment. He is a graduate of Harvard University.



Holguin

Holguin Promoted to Business Development Manager at Dynasty

Amelia Holguin has been promoted from project executive to business development manager at Dynasty Elevator, headquartered in Midtown Manhattan. Holguin began her career at Dynasty in 2021 as project executive. Previous roles

include project manager at Bronx-based Superior Elevator Technologies Corp. and design and estimates engineer at INSEL, SRL, in Santo Domingo, Dominican Republic. Holguin earned a bachelor's degree in electrical and electronics engineering from Instituto Tecnológico de Santo Domingo, and has completed OSHA construction industry and NYC site safety training

programs. "I couldn't be more excited to start my new role and continue to be a part of such an amazing team," she said in February when her promotion was announced.

VDA Acquires NYC-Based Omega Industries

vda® Elevator & Escalator Consulting, headquartered in East Hanover, New Jersey, with more than 30 branch offices around the country, announced the acquisition of NYC-based Omega Industries Inc. in March. Led by owners Greg DeCola and Dan Hrivnak, "longtime and well-respected industry professionals," Omega has grown tremendously over the past 10 years, VDA observed. Welcoming DeCola and Hrivnak to the VDA team, VDA said:

"This acquisition and partnership continue to show VDA's commitment to providing our clients with a vast array of resources while maintaining quality and professionalism. We look forward to a bigger and better future."

Schindler To Deploy Canoo EVs to U.S. Fleet

In March, Schindler announced plans to deploy 50 electric vehicle (EV) light-duty vans to its U.S. fleet, observing it is the "first in the industry to announce its intent to use [such vehicles] in the U.S." The 2023 Canoo Lifestyle Delivery Vehicle battery-electric vans will be implemented through Schindler's fleet management company. The vans will be customized for use by Schindler technicians, with features including a 200-plus-mi. range, 1532-lb payload, 133 ft³ of usable cargo space, eight airbags and advanced driver assistance systems. The move is part of Schindler's commitment to achieve net zero emissions by 2040. "We understand that companies like ours play a crucial role around climate change," Schindler U.S. CEO Ray Bisson said. "Deploying these vehicles brings us one step closer to a low-carbon future."



A Schindler EV light-duty van; image courtesy of Schindler

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Improvements at Borough Hall Station Include Three ADA Elevators

Upgrades at the NYC Metropolitan Transportation Authority's (MTA) Borough Hall subway station include three Americans with Disabilities Act (ADA)-compliant elevators, *Brooklyn Paper* reported in March. MTA tells ELEVATOR WORLD the elevators are being provided by Modern Elevator Innovations, a firm with locations in Chelsea and Burlington, Canada, which was acquired by ATTA Elevators Corp. last year (EW July 2022). One elevator will travel between street and mezzanine and two between the mezzanine and platforms. Also including reconstructed boarding areas and platforms, work is expected to run through early 2025 and will necessitate temporary partial station closures. Making the 4, 5, 2 and 3 train platforms fully accessible, the new elevators are in line with MTA's goal to provide an accessible subway station every two stops.

29 New Elevators To Be Installed at Subway Stations

As part of the MTA's commitment to make the NYC subway system 95% accessible, the authority is installing 29 new elevators at stations across the five boroughs, *Mass Transit* was among outlets to report recently. Approximately US\$5.2 billion has been set aside in the 2020-2024 Capital Program to make 67 stations accessible, "more than the previous three Capital Programs combined." Including eight stations that are part of MTA's public-private partnership program, contracts for 13 new accessible stations were awarded in 2022. Work is currently going on at at least 34 stations systemwide. MTA Chair and CEO Janno Lieber said the authority is "doing station accessibility projects at four times the pace of previous MTA capital programs" and is working with task force members that include representatives from each county within the Long Island Rail Road service areas, representatives of the NYC Mayor's Office for People With Disabilities, the Connecticut Office of Rail and New Jersey Transit.


Study: MTA VT Maintained by Outside Contractors Less Reliable

A study conducted by the office of NYC Councilman Keith Powers covering January found that MTA vertical-transportation (VT) equipment maintained by outside contractors is less reliable than that maintained by the authority itself, *New York Daily News* reported in February. "At any given time, more than 30 elevators and escalators are out of order," a spokesman for Powers said. The subway system has 284 escalators and 353 elevators, and MTA recently announced a plan to install an additional 29 elevators throughout the system. Third parties –

such as private companies and other transit agencies – manage 50 of the escalators and 56 of the elevators. The study found that broken VT maintained by the MTA is repaired and running within a day and a half, while that maintained by third parties – most often the result of a partnership between MTA and a private developer – takes an average of four-plus days to repair. "Although public-private partnerships are often touted as a route to accessibility, our review demonstrated that equipment maintained by third parties is a mixed bag," the study observed.

Consensus: Lack of Proper PPE for Women Is Dangerous

Ill-fitting personal protective equipment (PPE), such as safety vests, gloves and fall harnesses, is putting women in trades at risk and adversely affecting morale, *Construction Dive* reported in March. The report was based on feedback from The Safety Rack, a social media network that reviews PPE for women founded by Amy Roosa, and the Silver Spring, Maryland-based Center for Construction Research and Training (CPWR). Roosa, who works for Rolling Meadows, Illinois-headquartered insurance and risk consulting firm Gallagher, gave examples of her too-large safety vest getting caught on a door and jerking her backward and removing too-large gloves so she could perform her work. In an informal survey, CPWR found that nearly nine out of 10 women said they experienced difficulty finding well-fitting PPE. Some respondents said they found and purchased PPE on their own, "and thought, therefore, it wouldn't be tough for employers to do so on their behalf."

As the construction industry will need half a million more workers in 2023, demand for labor is high. Roughly 14% of construction workers are women – the highest it's ever been – but there is still room for improvement. A story in this month's issue of ELEVATOR WORLD, "Opportunities for All" by Erika Goldstein and Dot Mynahan on p.74, describes how Otis is addressing the labor shortage through supporting women. Another piece, "Bill's Memo" by Ray Downs on p.112 offers a more general, personal look at how a single decision helped changed an industry for the better. Be sure to check them out. 



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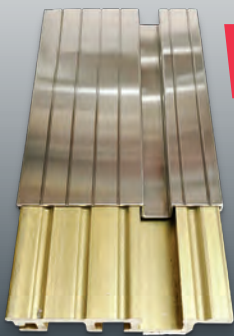
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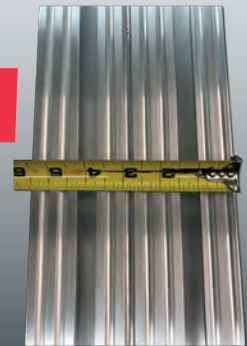
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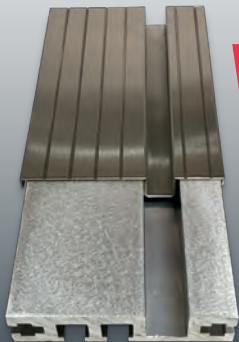
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Napoli

Schindler CEO Cautiously Optimistic About China 2023 Outlook

Silvio Napoli, CEO of Switzerland-headquartered Schindler, said he is cautiously optimistic about the elevator, escalator and moving walk manufacturer's business in China in 2023, *China Daily* was among outlets to report in March. Napoli's

sentiment is based on a predicted recovery of the Chinese economy and a gross domestic product target of approximately 5% for 2023. "I have lived in China long enough to know that the Chinese economy will always surprise everyone," Napoli told the source. Since equipment orders take up to 18 months before they arrive on construction sites, Napoli observed it will take at least until the second half of 2023 to return to growth. Accounting for approximately 17% of Schindler's sales, China is home to the OEM's second-largest R&D facility, for which Napoli oversaw expansion pre-pandemic. In February, Schindler reported that revenue increased by 1% overall to US\$12.24 billion and order intake decreased by 1.7% to nearly US\$12.95 billion. As for China, Napoli said, "We're patient, and not here for the short term only."

Decisions Made at KONE Annual General Meeting

KONE's Annual General Meeting was held in Helsinki, Finland, on February 28. According to the company, the meeting accomplished several items: approving financial statements, dividends and nine Board of Directors members. Members' annual compensation was confirmed, as well as a separate annual compensation to members of board committees. Re-elected as Members of the Board were Matti Alahuhta, Susan Duinhoven, Antti Herlin, Iiris Herlin, Jussi Herlin, Ravi Kant and Krishna Mikkilineni. Marika Fredriksson and Marcela Manubens were elected as new members. Additionally, audit firm Ernst & Young Oy was nominated as auditor for the 2023 term. A change to General Meeting protocol, it was decided the Articles of Association would be amended to allow for future meetings to be held remotely.

Brugg CTP Receives ASME A17 Standards Approval for Use in North America

Brugg CTP® coated ropes recently received American Society of Mechanical Engineers (ASME) approval for use in North America. The approval came about through creation of Part 5, a new section of ASME A17.6 code authored by Pat Dreps of Brugg Lifting North America (BLNA). A member of the Mechanical



Dreps

Design Committee, Dreps' work to create the new section of code took approximately three-and-a-half years. Dreps conducted research, analyzed data and consulted with industry experts to ensure the new regulations are safe, effective and practical. In addition to creating Part 5, Dreps also revised the existing A17.1 code to reflect necessary changes resulting from the new section.

BLNA President and General Manager Joseph Thompson said:

"This required a thorough review of the existing regulations to identify any conflicts or inconsistencies that needed to be addressed, as well as a detailed understanding of the new section to ensure that the two parts of the code were complementary and effective. The novel Part 5 is a testament to Dreps' expertise and dedication to the field, as well as the importance of the ASME elevator code in ensuring the safety and reliability of elevators in North America."

TKE



Gülan

Bora Gülan Named CEO of European and African Business

Bora Gülan has been appointed CEO of TK Elevator's (TKE) elevator and escalator business in Europe and Africa, the company announced in March. In addition to taking end-to-end responsibility for operations and management in these countries, Gülan will join TKE's global senior leadership team and report directly to CEO Uday Yadav. "We are delighted to welcome Gülan to TK Elevator. His passion for industry, dedication to safety, strategic mindset and drive for results make him ideal for the role," said Yadav. Former president of the North and Central European region at Otis, Gülan brings more than 25 years of leadership experience to his new role. He oversaw the merger of his family-owned elevator business in Türkiye with Otis and held several increasingly senior and high-impact leadership positions at Otis and United Technologies Corp. Gülan holds a master's degree in business administration from the Marshall School of Business at the University of Southern California and a bachelor's degree in economics from the Bosphorus University in Istanbul, Türkiye, along with further executive education degrees from Institut Européen d'Administration des Affaires and Oxford University.

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OEM Enters Nepal Market, Participates in Exhibition

TKE recently launched business operations in Nepal, followed by participation in Nepal Buildcon 2023, Regional Vice President (VP) Devender Sharma announced on LinkedIn in March. The eighth annual Nepal Buildcon took place in Kathmandu, Nepal, on February 23-26. The tradeshow is the country’s leading exhibition of its kind, with a mission to build up the construction sector. TKE India CEO Manish Mehan and VP Sales Mayank Desai were present to inaugurate the TKE-branded stall with channel partner Rycon Group. “Overall, it was a magnificent show, and we are hopeful for an extremely bright future for TKE in the days to come in Nepal,” said Sharma.



The TKE stall at Nepal Buildcon 2023; photo courtesy of Devender Sharma via LinkedIn.



Chenna

Berlin-Based Software Company Announces Seed Funding

Mainteny, a Berlin-based provider of software for elevator maintenance companies, in March announced what it describes as a large round of seed funding from Cusp Capital, an Essen, Germany-based venture capital firm focused on European software and technology. Mainteny was founded in 2020 by a team of former ThyssenKrupp employees including CEO Tom Chenna, who said:

“Many small and medium-sized [enterprises] (SMEs) constitute the backbone of the entire technical infrastructure, but are drastically underserved in terms of their specific software needs. Our software is intuitive to use and offers maintenance organizations huge potential for additional improvements in terms of time, financial and resource efficiency.”

Chenna observed that Mainteny enables elevator SMEs to digitize their business “along the entire value chain,” managing administration, customers, orders, spare parts and IoT integration without major implementation effort and cost.



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TKE Escalator Jobs

Another 35 Units for Brussels Metro

Heavy-duty victoria escalators from TK Elevator (TKE) are already in service in stations across the Brussels Metro in the Belgian capital, and the company announced it recently delivered another 35 units. Describing the Brussels Metro as “a prominent and longstanding customer,” TKE said on LinkedIn the escalators will help passengers “reach the next metro line in the heart of Europe quickly and efficiently.” victoria escalators, TKE observes, feature quality engineering, reliability and safety. The model boasts a maximum travel height of 50 m and more than 50 safety features and options.



TKE victoria escalator in the Brussels Metro; photo courtesy of TKE

Six Units for Largest Church in Canada

TKE Canada is installing six heavy-duty victoria escalators at historic Saint Joseph’s Oratory of Mount Royal in Montreal, according to a press release from the company in March. Founded in 1904, the Oratory is the largest church in Canada and the highest building in Montreal. The current shrine is 68 ft above street level, making the new escalators a critical part of the Oratory’s CAD160 million (US\$116.6 million) renovation, led by architecture firm Lemay. TKE America’s CEO Jeremy Rainwater said:

“Saint Joseph’s Oratory is one of Canada’s most inspirational spiritual symbols. To be entrusted to deliver this project is incredibly meaningful to our team at TKE, and we are looking forward to enhancing the visitor experience with our leading escalator systems.”

Traveling at a speed of 100 ft/min, the escalators will be located adjacent to the stairwell. Installation began in September 2022 and will be completed by spring 2023.



Saint Joseph Oratory; photo courtesy of Adobe

Otis Digitally Connected Gen3 Launches in South Korea

In March, Otis Elevator Korea Vice President and Managing Director IS Cho announced the Gen3™ digitally connected elevator is available in South Korea. Otis ONE technology is built into Gen3, allowing 24/7 real-time monitoring of equipment health and performance. Powered by IoT technology, the insights that come out of this process are accessible to both customers and service teams immediately via portals and apps, in turn enhancing equipment reliability and uptime. Otis observes Gen3 makes advanced passenger experiences possible through solutions such as the Otis eView™ in-car infotainment display, which can connect to the 24/7 OTISLINE® customer support center via video chat in case of an emergency. Through Gen3, customers can also access options such as the Otis eCALL™ Plus mobile app that enables passengers to call an elevator before they arrive. Gen3 boasts touchless operation, antibacterial features and the ability to link with automated robots. In terms of design, Ambiance for Gen3 reinterprets nature, architecture and artwork from Eastern and Western cultures under the theme “Voyage to Other Worlds.”

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Gen3 includes the eView display to stream infotainment to passengers; image courtesy of Otis.

Hyundai Elevator Competes To Win Contracts for Indonesia's New Smart City

Hyundai Elevator joined "One Team Korea" to bid on orders for smart city projects, *The Korea Times* reported in March. Due to overcrowding and ground subsidence issues, Indonesia is working to relocate its capital from Jakarta to Nusantara on Kalimantan Island. According to Hyundai, the country's government will invest 40 trillion won (US\$30.7 billion) in a five-stage development plan for the capital relocation project through 2045. Hyundai Elevator CEO Cho Jae-cheon said:

"As a member of One Team Korea, led by Land, Infrastructure and Transport Minister Won Hee-ryong, and a representative elevator company in Korea, Hyundai Elevator will actively cooperate in bidding on overseas contracts. Based on this, we will also do our best to explore and expand overseas markets in Indonesia and Saudi Arabia."



A robot greets passengers on Hyundai Elevator's mock-up elevator at Korea International Elevator Expo; courtesy of Hyundai Elevator.

The company currently provides robot linkage and open API services for its products to Korean IT giant Naver's headquarters in Seongnam, Gyeonggi Province. This technology enables features such as calling an elevator with a smartphone or providing customized information for screens in elevators by analyzing passenger data.



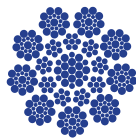
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Parallel Lay (PWRC)
9 Strands

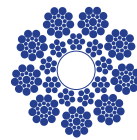


For applications demanding high MBF, minimum elongation and heavy usage.

| Elastic elongation | Permanent elongation | Lifting height* |
|--------------------|----------------------|----------------------|
| 0,070% | 0,090% | ≤ 425 m ≤ 1400 ft |

DP9

Mixed Core Rope
Parallel Lay (PWRC)
9 Strands



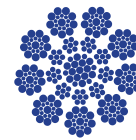
For applications demanding high MBF, minimum elongation and heavy usage.

Recommended for difficult installation conditions.

| Elastic elongation | Permanent elongation | Lifting height* |
|--------------------|----------------------|---------------------|
| 0,091% | 0,200% | ≤ 250 m ≤ 800 ft |

SCX9

Full Steel Core Rope
Separate Lay (IWRC)
9 Strands

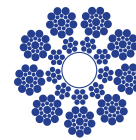


For applications demanding high MBF, minimum elongation and heavy usage.

| Elastic elongation | Permanent elongation | Lifting height* |
|--------------------|----------------------|----------------------|
| 0,083% | 0,100% | ≤ 325 m ≤ 1000 ft |

MCX9

Mixed Core Rope
Separate Lay (IWRC)
9 Strands



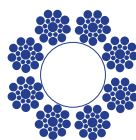
For applications demanding high MBF, minimum elongation and heavy usage.

Recommended for difficult installation conditions.

| Elastic elongation | Permanent elongation | Lifting height* |
|--------------------|----------------------|---------------------|
| 0,093% | 0,200% | ≤ 200 m ≤ 650 ft |

8X19

Fiber Core Rope
NFC (Sisal)
8 Strands

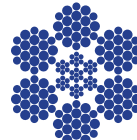


Recommended for standard low rise installation conditions.

| Elastic elongation | Permanent elongation | Lifting height* |
|--------------------|----------------------|--------------------|
| 0,101% | 0,290% | ≤ 75 m ≤ 250 ft |

TSR

Full Steel Core Rope
Separate Lay (IWRC)
6 Strands. Zinc-Plated



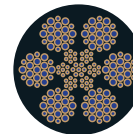
For high demands on small traction sheaves.

Suitable for conical grooves of $\geq 45^\circ$. Recommended for conical grooves and undercut round grooves.

| Elastic elongation | Permanent elongation | Lifting height* |
|--------------------|----------------------|--------------------|
| 0,102% | 0,120% | ≤ 75 m ≤ 250 ft |

CTP®

Full Steel Core Rope with TPU Coating
Separate Lay (IWRC)
6 strands

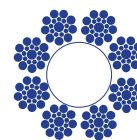


For highest demands on elongation, riding comfort and service life.

| Elastic elongation | Permanent elongation | Lifting height* |
|--------------------|----------------------|--------------------|
| 0,129% | 0,150% | ≤ 75 m ≤ 250 ft |

8X19

Wire Rope with Polypropylene Core
8 Strands
Seale



For high demands on elongation and corrosion protection with special rope lubrication.

| Elastic elongation | Permanent elongation |
|--------------------|----------------------|
| 0,142% | 0,22% |

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Interlift 2023 Shaping Up To Return to 2019 Levels

Trade fair organizer AFAG Messen und Ausstellungen GmbH said in March that interlift 2023, planned on October 17-20 at Augsburg Trade Fair Centre in Augsburg, Germany, is shaping up to return to 2019 levels, with greater international participation than ever before. By March, more than 350 registrations had been received, and AFAG expects around 500 exhibitors to attend, filling all available halls. With international exhibitors from Italy, China and India, “there is a strong possibility that the high foreign share of 70% [in 2019] will be surpassed” this year. In March, Italy led participation at 16%, followed by Türkiye (14%), Spain (10%) and Switzerland and Austria (3% each). AFAG expected the order to shift soon, including a large joint participation of 40 Chinese companies. In terms of what will be new, there will be changed block divisions and walks in some halls. Wittur is also planning to “surprise” visitors with a new, 600-m² stand in Hall 2 “with a special focus on modernization and a new family of digital products.”



The Wittur CUBE from interlift 2019 saw record attendance; photo courtesy of Wittur.

INTERNATIONAL INDUSTRY NEWS

Send to the editor: P.O. Box 6507, Mobile, AL 36660
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PHONE INTERFACE

The No Touch app is freely available in the Apple and Android stores to easily generate and manage QR codes. The app moves the elevator interface to each individual's personal phone which eliminates the need to touch common surfaces. Frequent destinations can be added as favorites for fast and convenient use.



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The No Touch® system from C.E. Electronics, Inc. gives elevator passengers an option to place hall and car calls without touching the physical buttons – thereby reducing the transfer risk of germs or other contaminants. The No Touch QR readers require a minimal footprint in the COP or hall station and can be added to existing elevators or designed into new construction. Convenient interfaces are available for many controllers as well as a discreet option. The No Touch scanners are designed to read QR codes printed on paper, stickers, ID badges, or generated via the No Touch smartphone app.



C.E. Electronics Inc.
ask for the extraordinary

India

OEMs showcase offerings and mark milestones in world's second-largest elevator market.

KONE

OEM Presents Innovations at IETF

KONE Elevators India Managing Director Amit Gossain joined esteemed customers Sushil Malik and Rishi Kapoor of Sudivha Developers to inaugurate the KONE booth at the 25th International Engineering and Technology Fair (IETF) at the Pragati Maidan exhibition center in New Delhi on February 16. KONE Elevators India showcased its latest innovations including KONE DX Class elevators, the world's first digitally connected elevators; KONE UltraRope*; proactive maintenance solutions; destination control systems; robots synchronized with elevators; and much more. IETF was held through February 18. Gossain observed:

"Elevators have evolved beyond just being vertical-transportation equipment. KONE DX Class elevators bring in a lot more cheerful sound and light while you move across floors. Meanwhile, we at KONE continue to disrupt the industry through value-added innovation and ensuring more success to our customers."



Gossain and colleagues check out a service robot at the KONE booth at IETF; photo courtesy of KONE Elevators India.

Company Named to Top Manufacturing Workplace List

KONE Elevators India announced that it has been recognized by Great Place To Work® India among India's Best Workplaces™ in Manufacturing 2023. Globally, KONE has 10 manufacturing units in seven countries that manufacture equipment and services that meet applicable codes and standards and may include additional safety features that exceed the applicable regulatory requirements. In India, KONE has an elevator manufacturing factory in Sriperumbudur near Chennai. Gossain said:

"We have been proudly making-in-India for 39 years, and our factory is equipped with the latest technology in production, reinforcing KONE's customer-focused strategy to provide the most competitive, highest-quality products with short delivery time."

Based on a rigorous evaluation methodology, the top 25 organizations among India's Best Workplaces in Manufacturing 2023 excel both in people practices that they have crafted for their employees and in proactively acting on feedback. Great Place To Work has been studying employee experience and people practices across organizations for more than three decades.

Johnson Lifts & Escalators Celebrates Safety Week in March

All 80 branches of Chennai-headquartered Johnson Lifts & Escalators celebrated Safety Week on March 4-10, with all employees pledging to follow safety rules and regulations. Included in the celebration were a safety slogan contest and a safety quiz contest that both saw enthusiastic participation. Winners were recognized and awarded prizes for their exceptional contributions. The week served as an opportunity for our staff to revisit their safety training and reinforce their commitment to maintaining the highest safety standards in all aspects of life. — *courtesy of Johnson Lifts & Escalators*

Continued



Scenes from the Johnson Lifts & Escalators Safety Week celebration; photos courtesy of Johnson Lifts

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Elevator ride quality is a first indicator of the quality of design, installation and service. The EVA-625 has become the **International Standard** for the absolute measure and analysis of ride quality and vibration & sound. The EVA system includes powerful analytical software tools to fully analyze all aspects of the elevator mechanical and control system.

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EVA-625

Elevators

Ride Quality (re: ISO18738)

- 3 Axis Vibration, Sound Level
- Maximum/A95/Jerk Zone
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- Jerk (Maximum)

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- Guide Rollers
- Sheave(s)/Ropes/Counter Weight
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- Ride Quality Report
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- Year to Year Comparison

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Ground Broken on Greece's First Residential Skyscraper

Lamda Development broke ground on The Riviera Tower, which will become Greece's tallest building when completed, *2LUXURY2* reported in February. Part of The Ellinikon, a 6.2-million-m² master-planned smart city on the grounds of Athens' old international airport, The Riviera Tower will offer one-to-five-bedroom residences overlooking the sea and park. Foster + Partners designed the 200-m-tall sustainable tower, which will become Greece's first residential skyscraper. The Riviera Tower is LEED pre-certified at the Gold level.

Other elements of The Ellinikon urban regeneration project include: The Ellinikon Park, the largest coastal park in Europe; The Riviera Galleria, a premium shopping destination; a commercial hub, the largest and most contemporary commercial complex in Greece; and a 310-berth marina, the first of its kind to offer large-scale mooring capacity for mega-yachts. Phase 1 completion, which includes The Riviera Tower, is expected in 2026.



The Riviera Tower; image courtesy of Lamda Development



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Elite Elevators Launches New Logo

Elite Elevators, a home elevator company headquartered in Chennai, unveiled a new brand logo to encapsulate its growth over the past decade. An authorized global partner of TK Access Solutions since 2022, Elite Elevators provides premium home mobility solutions. In November 2022, the company was named the "Most Luxurious Home Elevator Brand" by Business Mint market research company in New Delhi. This February, Elite Elevators launched its exclusive home elevator range, the E Series. A spokesperson for Elite Elevators said:

"Our new logo is a reflection of the myriad ways Elite Elevators has grown and risen as a company. We believe that this new logo and brand embodies the spirit of innovation, excellence and partnership that has always been at the heart of Elite Elevators. Now more than ever, we are steadily achieving our vision and mission and felt that it was the right time to refresh our look – literally – before we take on the world."

Elite Elevators offers German-engineered and Italian-designed products in India, Australia, Malaysia and the U.A.E. 



The new logo is part of a larger rebrand; image courtesy of Elite Elevators.

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Double-Deck Deep Dive

Forty-five years after opening, an icon of the Manhattan skyline is getting a completely modernized version of an elevator system that is one of only a few of its kind in the city.

by Kaija Wilkinson

photos by David Fried

Studio 54 was getting into full swing, NYC was feeling the fallout from a citywide electricity blackout and the reign of terror inflicted by serial killer Son of Sam had recently come to an end with his arrest the year the skyscraper then known as Citicorp Center opened, in mid-October 1977. The 59-story, 915-ft-tall Midtown Manhattan office building was designed by architect Hugh Stubbins of Emery Roth & Sons as headquarters for Citibank that included 1.29 million ft² of rentable office space. More than nine years elapsed between groundbreaking and the tower's grand opening, with land acquisition – including demolition of 31 buildings, mostly brownstone houses – commencing in 1968.

Featuring a sharply angled roof, four massive stilts to lift the tower over an existing structure and stories supported by stacked, load-bearing braces in the form of inverted chevrons, the tower has become an icon of the Manhattan skyline. It was officially recognized as such in 2016 when it was designated a historic building by the Landmarks Preservation Commission – the youngest NYC building to receive this

The sharply angled roof of 601 Lexington Avenue makes a statement on the Manhattan skyline.



Project Spotlight

designation. Another distinguishing feature of Citicorp Center, now known by its address, 601 Lexington Avenue, is an Otis vertical-transportation (VT) system that includes some of the first double-deck elevators in NYC.

An Engineering Crisis

The drama was not over — at least for Citicorp Center — as 1977 transitioned into 1978. That year, a significant structural flaw that could lead to the tower's collapse was discovered by a young Princeton University engineering student named Diane Hartley.^[2] She found that, due to a change order during construction that called for the chevron braces to use bolted — rather than welded — joints, certain winds could increase the load on the joints to the point of structural failure. According to Wikipedia:

“Worried that a high wind could cause the building to collapse, reinforcements were made stealthily at night while the offices were open for regular operation during the day. Estimates at the time suggested that the building could be toppled by a 70-mph (110 km/h) wind, with possibly many people killed as a result. The crisis was kept secret until 1995, and Hartley had no knowledge of the significance of her work until after that time.”^[2]

The situation was only publicly revealed in 1995 in a New Yorker article.^[2] “Imagine that,” says National Elevator Cab and Door (NECD) Design + Project Management Vice President Randy Lott, who is working alongside a team that includes David Fried and John Frondi at vda® Elevator & Escalator Consulting, Otis Elevator Co., Boston Properties and Gensler on a modernization of the tower's 20 double-deck elevator system. Lott says that, in structures class at Cornell University, from

which she earned a bachelor's degree in architecture, students were taught about the issue at Citicorp Center and the cloak-and-dagger way in which it was handled.

Double-Decks in NYC

Fried tells ELEVATOR WORLD the building is served by one of only a handful of double-deck elevator installations in NYC (another two are at 388 Greenwich and 120 Park Avenue). Fried observes the recently opened supertall 50 Hudson Yards on the far West Side also includes a bank of nine double-deck shuttle elevators to floors 20 and 21. The Cities Services Building at 70 Pine Street in Lower Manhattan, completed in 1932, was the first in NYC to have double-deck elevators, but they were converted to single-deck units in the 1980s, Fried adds. That's about 65 elevators out of the approximately 60,000 elevators in NYC — roughly 1/10th of 1%.

At 601 Lexington Avenue, the 20 double-deck elevators consist of three rises of main passenger elevators, all with 3000-lb capacity per cab for a total of 6000 lb for one double-deck unit. Otis originally constructed the elevator system for approximately US\$7 million.^[1] Using double-deck units cost about 25% more than a standard elevator system, but reduced floorspace occupied by elevators by 24%. A traditional system would have required 26 elevator hoistways.^[1]

All elevators and stairs serving the office stories are clustered in a central core. Although the upper and lower decks serve odd or even floors, people can travel between odd and even floors using escalators between main lobbies.^[1]

The elevator system consists of:

- ◆ Eight low-rise elevators traveling at 700 ft/min serving the lobby and floors 14-30

Bank of elevators at 601 Lexington Avenue





Lexington Avenue plaza lower entrance



Close-up of an existing cab

- ◆ Six mid-rise elevators traveling at 1,200 ft/min serving the lobby and floors 31-45
- ◆ Six high-rise elevators traveling at 1,400 ft/min serving the lobby and floors 45-59

There are also two all-floor service elevators and two below-grade loading-dock elevators to be modernized. Also notable is that 601 Lexington Avenue was the first building in NYC to feature a tuned mass damper, which is designed to counteract sway due to wind, reducing movement due to wind by 50%.

Cabs

A key aspect of elevator modernization is the design and installation of the elevator cabs. It is what the riding public sees during every trip. NECD was selected for this important part of the job, with Lott as project manager. After spending 15 years in architecture as head of a design team at MdeAS Architects, Lott joined NECD in September 2015. She says:

“With a background where I did a lot of material R&D, I am able to navigate the nuances between architects and contractors. It’s important to understand the complexities of any number of trades and construction methodologies and, in particular, elevators, which are very niche with their own set of government codes and requirements. Weight issues are very important. On high-end, complex jobs like this one, I work very closely with the design team and foster

An early challenge that presented itself was the weight of the passenger cabs.

relationships. As an architect, I am able to see ways to achieve what's shown in a rendering or tell people why something is not feasible."

The Mod

All 20 double-deck passenger elevators will receive the latest destination-dispatch technology. As is often the case, the building will be fully occupied during the modernization. An early challenge that presented itself was the weight of the passenger cabs. Existing cab shells are being replaced with the new, aluminum shells that reduce the weight by more than 300 lb per cab in some cases. In addition, code compliance-related electrical work will be performed under the aegis of major NYC construction manager Structure Tone.

In response to being asked what is most challenging about this project, Fried says there is no lack of challenges in a project of this scope, but that's going to be a question best answered once the project is complete. Frondi adds that this project is both elaborate and complex, consisting of a multitude of moving parts warranting constant communication, project oversight and coordination among all project team elements to ensure, at the end of the day, success is realized. The passenger elevators are due for completion in late 2026 and the service cabs, in late 2027. An initial set of four elevators – two upper and two lower decks – were delivered by NECD in late February. EW plans to follow up on this interesting project as it progresses.

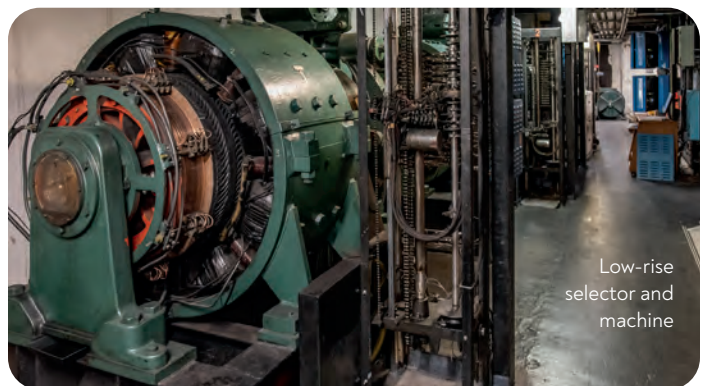
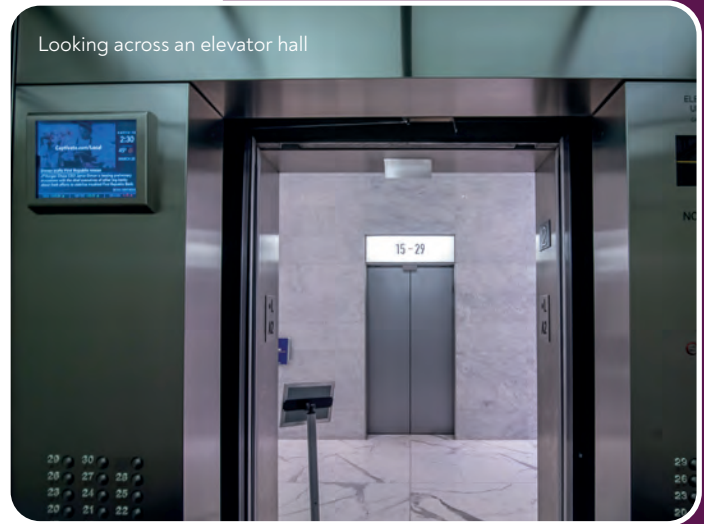
References

- [1] en.wikipedia.org/wiki/Citigroup_Center
- [2] en.wikipedia.org/wiki/Citicorp_Center_engineering_crisis
- [3] "Boston Properties Completes Acquisition of Citigroup Center," Boston Properties press release, April 25, 2001.

David Fried is vice president of sales at VDA.

601 Lexington: Ownership Through the Years^[3]

When it was completed, Citicorp Center was owned by three separate entities: St. Peters Evangelical Lutheran Church (the only remaining previous occupant of the property for which a new church, designed by Stubbins, was built), Citicorp and Dai-Ichi Mutual Life Insurance Co. Citicorp sold its stake to Dai-Ichi in 1987. Real Estate Investment Trust Boston Properties bought the property from Dai-Ichi in 2001. It has since undergone numerous renovations, including to its shopping concourse, lobby and, most recently, to the majority of its 270,000-ft² office annex. A new food hall called "The Hugh," named for architect Hugh Stubbins, opened in late 2020 and features some 17 restaurants, bars and food retailers, representing what has been described as "a U.N. of food."



Editor's Note: All photos were taken prior to modernization.

Make Way for Modular

Modular Elevators Manufacturing, Inc. offers solutions to meet increasing demand for modular elevators.

by Kathleen Farrell

California-based TL Shield & Associates, Inc., a full-service vertical-transportation company owned by Tom Shield, began distributing modular elevators soon after their invention in the 1990s. The team noticed some design flaws, and when their call for revisions was unheeded by the product's manufacturer, TL

Shield decided to use its experience to create a new company and improved line of modular units: Modular Elevator Manufacturing, Inc. (MEM) and the MEM elevator system.

Since 2004, MEM has provided conventional, commercial-quality elevators, delivered in an unconventional way, for

low- and mid-rise applications. Marketing Director Russ Ward says the two greatest benefits of modular elevators are reduced time and investment. The MEM Elevator System arrives at the jobsite fully assembled and ready to be placed in the hoistway, allowing faster project completion. According to Ward, MEM enjoys a 98% first inspection pass rate for its units. Costs are lowered by shorter construction timelines and standardization across similar projects. The product can be fully operational two days after delivery, and Ward said one project supervisor estimated the MEM Elevator System saved approximately US\$40,000 in construction costs per entry.

Ward has spent the last decade of his 30-year marketing career in the modular elevator industry. Over the years, he has seen major changes in demand, saying:

"When I first started, you had just two companies producing around 15 to 20 units annually. Now, there are three manufacturers in the U.S., and the MEM Elevator System has tripled [production numbers across] the entire industry annually. We have had true exponential growth, and it will continue."

When MEM began production, their largest market segment was schools looking to quickly meet Americans with Disabilities Act of 1990 (ADA) requirements. Today, MEM has customers across multiple industries, providing solutions for affordable housing, commercial projects, the healthcare sector and more.



MEM wants customers to know that modular does not equal cookie cutter; photo courtesy of MEM.



Multi-level parking structure at San Jose State University's south campus; photo courtesy of Jason O'Rear for Watry Design, Inc.



A bright green modular elevator at Educare Los Angeles at Long Beach; photo courtesy of MEM

MEM reports an 80% return customer rate, and Ward notes that many of those who did not return simply had one-off projects. With approximately 40 employees, the MEM team's core values are innovation, consistency, quality and simplicity. "We understand the need for quality and do our utmost to produce it day in and day out," said Ward. "As a result, the MEM system is the gold standard when it comes to modular elevators, as we revolutionize the entire elevator industry."

Ward anticipates MEM will once again double production, but in half the time, as modular elevator product acceptance is now mostly nationwide across all building sectors. He feels the elevator industry is overdue for a change, and going modular is the solution. MEM is a company that likes to show its work and welcomes anyone with questions to take an in-person or live virtual tour of its San Fernando, California, manufacturing facility. 

“The MEM system is the gold standard when it comes to modular elevators, as we revolutionize the entire elevator industry.”

— MEM Marketing Director Russ Ward

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10 Questions (Plus a Bonus) With “Your Elevator Pal” Ed Rivera

LinkedIn personality takes some time to answer your author’s questions.

by Matthew Jackson, EW Correspondent

I believe one of the hardest parts about writing this column is determining the next interesting person to answer my 10 questions. There are so many interesting people in our industry, and never a shortage of characters. A little while ago, one such character jumped out at me from the pages of LinkedIn: Ed Rivera, “Your Elevator Pal.” I know Ed from our mutual connections in the NYC elevator industry. He is now a regional trainer for modernization with TK Elevator (TKE), and very much believes the mantra, “Build elevators, build escalators, but, above all, build each other.” Is Rivera building a brand? I don’t know. But he believes that he is sharing education. Rivera is very serious about passing on his thoughts and wisdom to benefit the greater elevator industry and his 2,375 (and growing) LinkedIn followers. He is a person who is beyond passionate about not only his work but his home life, as well. To say I appreciate having Rivera sit down for a “10 Questions” would be a great understatement. We met up at one of his project sites in NYC, and I had a great time catching up and hearing his excellent answers.

MJ: Tell us how it all began.

ER: If you follow me on social media, you probably know me as “Your Elevator Pal.” What you probably don’t know is I was

born and raised in a small, one-bedroom apartment in Brooklyn, NY, and that I knew since kindergarten that I would one day work with my hands for a living. I mean, the writing was on the wall. “Building blocks” was, without question, my favorite school subject, lol. This love is what led me to attend a vocational school – [William E. Grady Career and Technical Education High School in Brighton Beach, Brooklyn] to be exact. It was there I studied electrical. In fact, I later learned some of NYC’s most talented elevator mechanics also attended William E. Grady. Upon graduation, I was preparing to join either Con Edison, the Metropolitan Transportation Authority or the International Brotherhood of Electrical Workers Local 3 [in Flushing, NY]. All three organizations were frequent employers of William E. Grady electrical graduates. I had no clue such a thing as an elevator industry existed.

MJ: Tell me about your elevator career, from the beginning until now.

ER: While I was waiting to take exams and eventually hear back from those three organizations, I interviewed with what I thought was a company that built and worked on elevators. Lo and behold it was a vertical-transportation (VT) consultancy, and the job offered was that of a file clerk – not exactly what I had in mind, but I made the best of the opportunity. While working there, I made it my business to learn about the business. With that approach, growth, opportunities and relationships blossomed. One of those relationships was with the president of an elevator company who I later found out was also a Grady graduate. For me, the appeal and beauty of the aforementioned company was the fact it was founded, built and led by elevator mechanics. That resonated with me. It also didn’t hurt that it employed the industry’s most talented workforce – the International Union of Elevator Constructors (IUEC) Local One, a union of which I am still a proud member.

MJ: Even though you are a member of IUEC Local One, you’ve worked for both big and small companies and even had a short stint in the VT consultant world. Tell us what it is like

Continued



(l-r) Your author and Ed Rivera crack up over being recognized on the streets of Manhattan.

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— Ed Rivera

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“*At the end of the day, LinkedIn is a free, social media platform that, when utilized properly, can bring significant value to both our professional and social lives.*”

— Rivera

working at each, their differences and how each affected your work life and habits.

ER: As I mentioned, I made it my business to learn this industry. In doing so, I took on and experienced a variety of growth opportunities and roles. To sum those up, I went from a file clerk to a junior project manager to a mechanic to a foreman to a general superintendent to a consultant to a foreman to my current role as a regional trainer at TKE. Honestly, I could probably write a book if I were to go into detail about all those experiences. What I can say, in short, is that each place of employment entrusted me with tremendous responsibilities and provided me the opportunity to grow.

MJ: You’ve upped your game by becoming a LinkedIn poster. You post almost every day. How do you fit it in?

ER: Although it may appear that way, posting daily isn’t a priority for me. There are some weeks when I put out content daily, and there are others when I don’t. When I *do* post, the posts come naturally, since a lot of my content is inspired by real-life conversations and experiences. I would say, at most, I spend 10 min creating a post.

MJ: Any backlash to your postings?

ER: No backlash, per se. I think what I post is honest and from the heart. Now, that doesn’t mean my messages are always received as such. That, however, is not something I can control, as we all view life through our own lens.

MJ: I’ve heard you referred to as the “Tony Robbins” of the elevator industry – nothing but positive vibes. Do you think of yourself that way?

ER: That is hilarious. I can’t say that I do. I think of myself as an elevator guy on LinkedIn who is simply sharing his passion about the profession. If it resonates with others, great. If not, oh well.

MJ: I’ve seen that you’ve included your daughter and wife in some of your posts. Any second thoughts about choosing to do so?

ER: No second thoughts. Work and family tend to be a large part of our lives, with family being the most important part and the part that is relatable across all professions. So, my occasional relatable post that includes family members seems appropriate.

MJ: You’re big on mentoring in our industry. Who have been your mentors over the years?

ER: Mentoring is the single most important thing a seasoned professional can do. It’s how we, as a whole, can continue to elevate our industry. In no particular order, the following individuals have had the biggest impact on my professional

Continued

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by John W. Koshak



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development and will always hold a special place in my heart: Dan Nichuals, past owner and co-founder of BOCA Group; Joe Brown, lead construction superintendent at TEI Group; Wayne Locker, vice president, technical support and education, TEI group; John Fichera, former owner and executive vice president (EVP), modernization, TEI Group; Mark Gregorio, current owner and president, TEI Group with Mike Staub, EVP, operations; and Robert Monforte, president, operations, Champion Elevator.

MJ: You have more than 2,000 LinkedIn followers and so many more responding. What's the end game? Where is Ed Rivera heading?

ER: Metrics are interesting, but they don't drive me to create content. At the end of the day, LinkedIn is a free, social media platform that, when utilized properly, can bring significant value to both our professional and social lives.

MJ: Name three dinner guests you would want to sit down and have a conversation with.

ER: Elisha Otis, for obvious reasons. Andrew Carnegie. He embodied the American dream – the immigrant who went from rags to riches. William Edward Deming. He is widely acknowledged as the leading management thinker in the field of quality.

MJ: These answers are fantastic, so I'd like to add a bonus question. Your dinner guests – one is the originator of the elevator, one is a successful businessman and the last, a management quality guru. This leads me to ask where you think our industry is headed in relation to labor, safety, company expansion and elevator equipment.

ER: That's a great question. I think it is business as usual for our industry. When you think about it, our industry isn't overly complex. We're basically providing and maintaining the "moving boxes" and "moving stairs" for our customers. Innovative technologies will continue to emerge, providing customers with unique solutions to their "people moving" problems. In addition, the industry will continue to provide the labor force with technological innovations to help streamline new installations. Safety will remain at the forefront of what we do.

Let's talk about company expansions. It's venture capital city in our industry right now. For better or worse, venture capitalists have taken a liking to our industry and have been investing heavily in the past five years or so. How these will all shake out is going to depend on the vision each investment group has. So, depending on where you sit, we can expect both great and not-so-great things to come out of these investments.

Regarding labor, the IUEC and National Elevator Industry Educational Program will remain the platinum standard for qualified VT mechanics. But other VT mechanic training programs are emerging. It will be interesting to see how all of these programs evolve.

To sum it all up, the beauty of our industry is our people: the weirdos like myself who are passionate about people, these "moving boxes" and "moving stairs," continuous movement, developing the next and future generations, and who understand that, to be truly successful in the long game, we have to continue investing in and developing our people. 🌍



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Industry and University Unity in Iran

12th International Seminar on Elevators and Escalators

by Mohammad Masoud Majidifar

The 12th International Seminar on Elevators and Escalators was held with the cooperation of the University of Applied Science and Technology and Iran's union of elevator, escalator and affiliated services with the presence of academic staff and industrialists at the Koosha International Center of Applied Science and Technology in Iran on February 23.

The seminar was held with the presence of Dr. Pishbin, the manager of the University of Applied Science and Technology (Tehran Branch); Eng. Abbas Abrishami, the manager of Iran's union of elevator, escalator and affiliated services, experts, professors, industrialists; and a foreign guest.

After reading passages from the Quran and the national anthem, Dr. Sajadi, the educational deputy of Koosha College, thanked outstanding industrialists, professors, foreign guests and sponsors for their presence and declared that, for the 12th time, "We utilized elevator industry knowledge in order to achieve our goals, and, in tough economic circumstances, we respect our industrialists and professors."

Sajadi expressed that countries don't progress unless they increase wealth in their communities, and gaining wealth is due to the strong relationship between industry and university. She added the seminar secretariat had received 22 articles and also the experts' panel on "the investigation of the quality record of domestically manufactured parts in competition with imported parts and future strategies" is being held for the second time in Iran.

During the opening ceremony, Pishbin mentioned the weakness of university-industry relations, expanding on the university-industry role in country development. He mentioned



Sajadi spoke first and thanked the attendees, guests and sponsors for their presence.

that holding these symposiums and seminars helps improve this relationship, and we should pay more attention to our technicians and technology for advancement.

Then, Abrishami gave a talk on the elevator industry and the necessity of precise planning for accomplishments. He emphasized the support of training

centers to develop education in this area. Finally, he analyzed the union strategy toward empowerment and skill growth in the industry and high safety in elevators nowadays.

Afterwards, Eng. Mahalei, director general of the engineering services office, declared technical training and guarantees in the elevator industry are crucial because of the importance of safety in this area.

After that, Dr. Hosseinahad presented his article on evaluating the performance and measuring the efficiency of the elevator to increase effectiveness. He investigated the failure rate and analyzed the matter by data envelopment analysis (DEA) method.

Then, Eng. Mozafarpour gave a speech on elevators resistant to earthquakes. He mentioned how earthquakes occur and the important factors of the design and manufacture of elevators resistant to earthquakes.

Next, Dr. Eskafi presented his article on designing and manufacturing smart buffers. He explained buffer application in various industries and effective factors on their function. Also, he declared the usage of non-Newtonian fluids in these kinds of buffers.

After the break, Eng. Ebadi gave a presentation on his article on public elevator requirements. He investigated EN-81 standards and elevator protection from vandalism.



Eskafi was chosen as the best article presenter.



Pishbin spoke during the seminar opening.



EW, represented by Bülent Yılmaz, receives a plaque for being a media partner of and attending the event.

Next, Eng. Hasandoost gave a talk on her article about the usage of nylon in the elevator industry. She mentioned the usage of nylon in pulleys and its advantages for the environment, energy consumption decreases and lower costs.

Eng. Esmaili followed and gave a talk on challenges in escalator use in public transportation. He expressed that choosing the escalator according to user type and technical details is really important, as well as its bill of materials (BOM).

Next, the expert panel on the “investigation of the quality record of domestically manufactured parts in competition with imported parts and future strategies” was held for the second time in Iran. Eng. Ememirad was the chairman of the panel, and the engineers and experts discussed the topic. Also, representatives of different sectors, such as interior production, importation, standards and human resource management, were present for the panel. Its goal was to compare elevator parts production in Iran and elevator parts importation, as well as to analyze the business plan and economic feasibility.

According to the experts, Iran is strong in elevator parts production, scoring more than 80 out of 100 in this area. Also, domestically manufactured products are able to compete with European products since manufacturers have a high ability and capacity for production.

Afterward, Eng. Mardomi spoke about the elevator and escalator union activities and function and its achievements.



Attendees listen to presentations.

At the seminar, qualified articles were presented in the convention hall with the instructors present. Twenty-two articles were sent to the seminar secretariat, and 10 articles were accepted according to the scientific committee’s judgment. Out of the 10 articles, six were presented by the authors at the convention hall.

At the end, commendation letters were bestowed to the foreign guest, elevator companies at the seminar, elevator and escalator industry experts and the presenter of the best article. Eskafi, head of the department of elevator and escalator

Continued



Industry leaders gathered for the 12th time.

engineering at Koosha College, was chosen as the best article presenter.

In this seminar, 13 elevator corporations participated as sponsors:

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- ◆ Diara

Also, one significant international guest from Türkiye took part at the seminar: Mr. Bülent Yılmaz, managing director of ELEVATOR WORLD Türkiye and Middle East publications.

In conclusion, all participants are invited to the 13th International Seminar on Elevators and Escalators in February 2024. 🌐



Attendees gather for a group photo.

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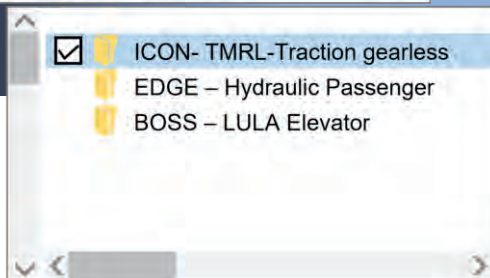
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A Versatile Solution

PU-coated ropes: It's a lifetime decision

by Pat Dreps and Joseph Thompson

Polyurethane (PU)-coated ropes are a type of high-performance rope used in elevator applications. These ropes are made of a high-tensile steel wire rope that is coated with a special type of polyurethane material. The combination of the steel wire rope and the PU coating results in a rope that is lightweight, durable and offers superior performance compared to other types of ropes. Figure 1 below shows a cross section of a typical PU-coated rope.



Figure 1

Learning Objectives

After reading this article, you should have learned about:

- ◆ The relationship between wire tensile grade and hardness of the wire
- ◆ The type of drive sheave groove required to use polyurethane coated ropes
- ◆ The difference in traction capability of conventional wire ropes on steel sheaves to polyurethane-coated wire ropes on steel sheaves
- ◆ The difference in the minimum drive sheave diameter allowed on a conventional wire rope to a polyurethane-coated wire rope
- ◆ The lifetime expectation differences between a polyurethane-coated rope and a conventional wire rope

In this article, we will explore the properties of PU, as well as the applications of PU-coated ropes in elevators. Advantages and disadvantages compared to other types of ropes will also be discussed.

First, PU is a highly versatile and durable polymer used in a wide range of applications. PU is created by reacting a polyol (an alcohol with multiple hydroxyl groups) with a diisocyanate (an organic compound with two isocyanate groups) in the presence of a catalyst and other additives. The reaction produces a flexible, or rigid, material with a range of properties that include hardness, elasticity, abrasion resistance and chemical resistance. PU can be molded into a wide range of shapes, extruded into long continuous lengths (which is the case on a wire rope) or sprayed onto surfaces as a coating. It is used in the manufacture of furniture, footwear, automotive components, coatings, adhesives and insulation, among many other products. PU is prized for its durability, resistance to wear and tear and its ability to be customized to meet specific needs. This customizability is key to its use on wire ropes. This is especially beneficial when it comes to having the proper traction between the coated rope and the sheave. The PU coating is of particular benefit when it comes to protecting the sheave from damage caused by the wires in a wire rope wearing on the sheave. Most people who have spent even a minimal amount of time in an elevator machine room have seen the effects of a wire rope wearing on a sheave groove. This is typically due to unequal tensioning of the ropes in the system, causing one or two ropes to carry a disproportional amount of load. A PU-coated rope does not solve the unequal tension issue, but may prevent damage from occurring to the sheave. Figure 2 below shows typical PU pellets in their raw state.

Continued



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Figure 2

Secondly, the relationship between wire tensile strength and hardness is such that stronger wires are typically harder than the typical wires used in conventional wire ropes. It would not be possible to use such high tensile, and thus harder, wires without the use of a PU coating, as they would cause damage to the sheave. PU provides a protective layer that prevents wire rope from being damaged by the sheave by reducing friction between the wire rope and the sheave, which helps to extend the life of the wire rope. If we look at the wires in the PU-coated rope, they are much higher tensile grade than that of conventional steel wire ropes. Most are familiar with the terms “Traction Grade” or “EHS” (Extra High Strength) that are used with conventional wire ropes. “Traction Grade” refers to the grade of the outer wire used in the rope (see Figure 3), so for “Traction Grade” the outer wire would typically be 1,180 or 1,370 N/mm². That is to say, that in a typical 8 X 19 Seale design wire rope, where the construction is eight strands consisting of 19 individual wires per strand, the nine outer wires would be 1,180 or 1,370 N/mm².

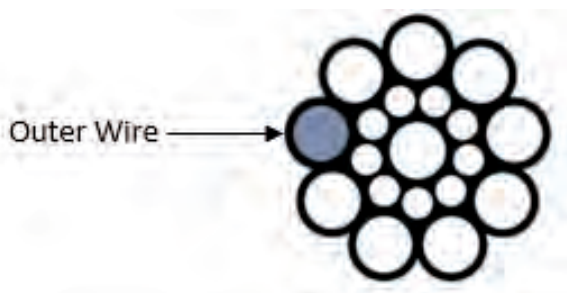


Figure 3

Depending on the user, some consider EHS to be 1,570 N/mm², 1,680 N/mm² or 1,770 N/mm². The wires in a PU-coated rope can have a tensile grade as high as 3,500 N/mm². This allows for a rope of a much smaller diameter to have a much greater strength than that of a conventional wire rope of the same diameter. One can see that, since there is a direct correlation between the hardness of the wire and the tensile strength of the wire, that using such a high tensile wire with an uncoated rope would cause extensive damage to the sheave. This is not a concern with PU-coated rope, as the wires never

come in contact with the sheave, allowing for the use of such high tensile (and thus harder wires) without causing damage.

PU-coated wire ropes are particularly useful for high-performance applications where their highly customizable properties can be tightly controlled to achieve the needed performance of the system. Their unique properties, including high wear resistance, flexibility and chemical resistance, make them an ideal material for use in wire rope coatings. Additionally, the extrusion process used to apply PU around the wire rope allows for precise control over the coating thickness, resulting in a consistent and uniform protective layer.

As mentioned above, an extrusion process is used to apply the PU to the wire ropes. This process of extruding the PU coatings involves the use of specialized machinery to heat and melt the polymer before it is forced through a die to form a specific shape or profile (see Figure 4). In the case of wire ropes, the extrusion process involves feeding the wire rope through a die that is heated to a specific temperature, then extruding the PU coating around the wire rope as it passes through the die. This creates a smooth and consistent coating that conforms tightly to the shape of the wire rope, providing excellent protection and improved handling. PU coatings can be customized to meet specific application requirements, including variations in hardness, color and chemical resistance, making it a versatile solution for a wide range of wire rope applications. In addition, the high extrusion pressure used in the process helps force the PU coating inside the wire rope, filling any gaps or voids between the individual wires. This results in a complete and uniform coating that provides excellent protection against abrasion, corrosion and other forms of wear and tear. The ability of PU to conform to the shape of the wire rope and penetrate its internal structure is a key advantage of this coating, as it helps extend the service life of the rope and improve its overall performance. The extrusion process also allows for precise control over the thickness and consistency of the coating, ensuring it meets the exact requirements of the application.

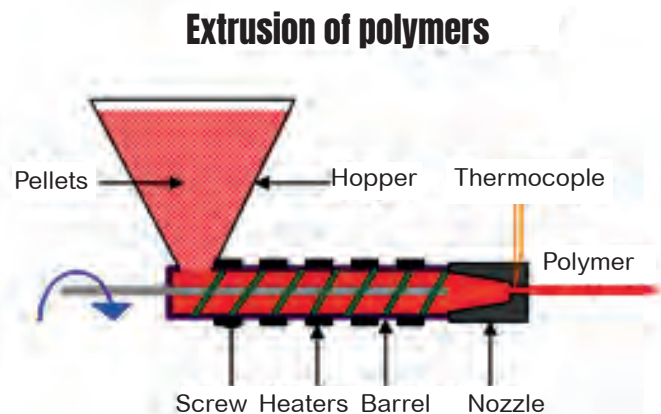


Figure 4

Since PU-coated ropes use high tensile wire, these ropes typically have a much higher E-Modulus, or said another way, less stretch or lower elongation than of that of comparable conventional ropes of the same diameter. With this low elongation, or stretch value, there tends to be fewer issues with sill alignments at floor levels. This property is particularly important when it comes to excessive re-leveling. We are all aware of the re-leveling that can occur as people enter and exit the car. This re-leveling is minimized with a rope with a high E-Modulus or low amount of elongation. The low elongation property also contributes to smooth and vibration-free elevator rides.

Another benefit of polyurethane coating on PU-coated rope is it provides excellent abrasion resistance while protecting both the steel rope and the drive sheave from damage due to friction and wear. As mentioned above, the wires never contact the sheave. Only the PU does, and thus, has a couple of advantages over conventional wire ropes. With the PU on steel having a traction coefficient of typically three times that of conventional wire rope on steel, there is no need to use aggressive grooves such as undercut U-grooves or V-grooves that severely shorten rope life to generate the needed traction. It is important to understand that the surface roughness of the drive sheave in conjunction with the surface roughness of the PU-coated rope determines the amount of traction that can be achieved. Unlike with conventional wire ropes where there is steel on steel and the coefficient of friction is fixed and well known, a PU-coated rope's surface roughness can be altered or customized to achieve a desired coefficient of friction on a given sheave roughness. This customization is achieved by various controls in the aforementioned extrusion process and is one of the key benefits of PU-coated ropes over the conventional wire ropes.

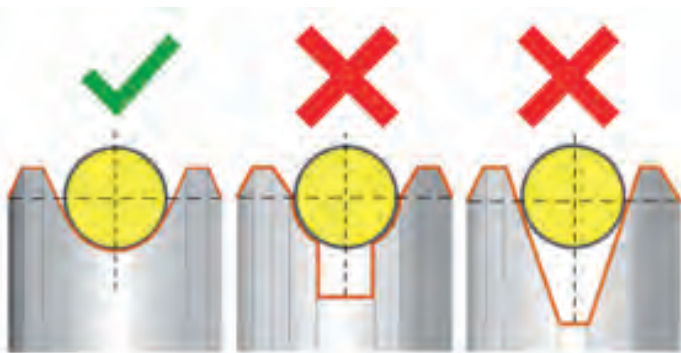



Figure 5


Lifetime of suspension means is always a topic when discussing elevator design. With today's elevators, there is a common discussion that takes place around today's suspension not lasting as long as it used to. PU-coated ropes will always have longer lifetimes compared to conventional steel wire ropes because the wire rope is naturally protected by the coating and the sheave is also naturally protected from wear by the coating. Per A17.1, an elevator suspension means member must be retired when it falls below 60% of its original breaking strength. Some PU-coated ropes have been subjected to a

Continued





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90-million-cycle bending fatigue test that ran 24 h a day, seven days per week for multiple years. When the ropes were removed from the test machines, they broke with residual strengths above 90%.

Let us consider a typical PU-coated rope 2:1 installation (which is very similar to PU-coated steel flat belt elevators) where there are three simple bends in the most-used rope section in every trip. For this discussion, the meaning of “trip” is every change in direction of the drive sheave as the elevator travels up and down. For example, you start in the lobby and stop at floors 4, 6, 9 and 12 while traveling to the 15th floor, then go back down to the sixth floor with no stops on the way. There were multiple starts on the way up to the 15th floor, but there was only one trip (when the elevator reversed direction) in this example. A standard usage elevator endures 150,000 trips per year on average. During each trip, the PU-coated ropes mentioned in this paragraph experience three simple bends in the most-used rope section during every trip. So, this elevator’s most-used rope section experiences 150,000 x 3 simple bends equals 450,000 simple bends per year. If the desire is to have suspension means last 15 years using this example, the PU-coated ropes would cycle through 450,000 simple bends per year X 15 years for a total of 6.75 million simple bends.


A further advantage of PU-coated ropes in elevator applications is their ability to dampen noise. Traditional steel wire ropes can generate a significant amount of noise due to vibrations caused by the movement of the elevator car. The PU coating on the coated ropes acts as a noise dampener, reducing

the amount of noise generated during elevator operation. This is particularly important in buildings where noise levels need to be kept to a minimum, such as hospitals, hotels and residential buildings. The noise-dampening property of PU-coated ropes can help create a more comfortable and peaceful environment for elevator users and those in the surrounding areas.

The combination of the steel wire rope and the PU coating results in a rope that is much lighter than other types of ropes with comparable strength. This lightweight property is particularly important in elevator applications where the rope weight directly affects the energy efficiency and performance of the elevator. Not only is the rope itself lighter, but the above-mentioned higher traction coefficient allows for a much lighter car to be used, reducing the initial cost of producing the elevator. By using a lightweight, PU-coated rope in conjunction with the lighter car, elevator manufacturers can reduce the energy consumption of their products and lower operating costs for building owners without sacrificing the capacity of the car. Another advantage of PU-coated ropes is their ability to operate with smaller sheave diameter to rope diameter (D:d) ratios. Traditional ropes require larger D:d (40 to 1 is the minimum allowed) to prevent excessive damage to the wires. PU-coated ropes, on the other hand, can operate with smaller sheave diameters – D:d of 25 to 1 – due to the protective PU coating and high tensile wires. This means elevator systems using PU-coated ropes can have smaller sheave diameters, which reduces the torque requirement of the drive motor, thus


Continued

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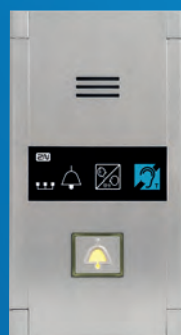
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reducing the size of the motor required. This, in turn, reduces the overall size of the elevator system, allowing for more efficient use of space.

PU-coated ropes require little maintenance compared to other types of ropes. The polyurethane coating encapsulates the wires inside and provides some protection against the wires themselves wearing on each other and producing rouge, which is common in conventional ropes when there is lack of lubrication. This PU coating eliminates the need for external lubrication. In fact, lubrication is not allowed, as it would adversely affect the traction.

Some wonder if PU-coated ropes require special wedge shackles or special load tension equalization devices. The answer is, “No.” PU-coated ropes use the same wedge shackles conventional steel wire ropes use. PU-coated ropes also use the same load equalization devices conventional steel wire ropes use.

In addition to the properties mentioned above, PU-coated ropes have a number of specific benefits that make them an attractive choice for elevator applications. When PU-coated wire ropes are cut, the polyurethane coating prevents the wires from unraveling, eliminating the need for seizing the rope ends. This is a significant advantage over conventional ropes, which require the ends to be seized prior to cutting the rope to prevent the strands from moving out of position. Figure 6 is a photo of what is known as a “Scattered I-Line.” This is a clear indication of strands that have moved out of their original position. Strand movement is one result of inadequate seizing. This feature makes PU-coated ropes easier to manage and install, saving time and reducing the risk of injury during installation while seizing and cutting to final length once the ropes are pulled in.

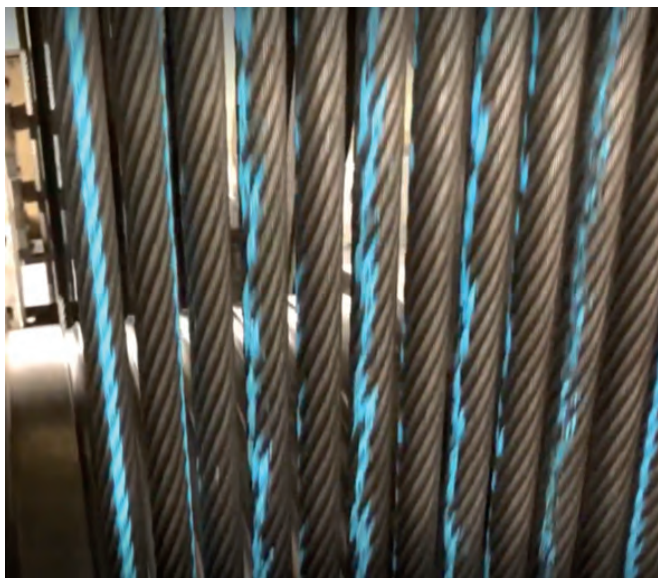


Figure 6

Learning-Reinforcement Questions

Use the below learning-reinforcement questions to study for the Continuing Education Assessment Exam available online at www.elevatorbooks.com or on p. 121 of this issue.

- ◆ Can wires in coated ropes be much higher strength than wires in conventional steel wire ropes?
- ◆ What geometry drive sheaves are used in a coated rope installation compared to geometry of drive sheaves used in a conventional steel wire rope installation?
- ◆ How is traction generated when using coated ropes and is this different compared to when conventional steel wire ropes are used?
- ◆ Can the D:d ratio be smaller than 40:1 when using coated ropes?
- ◆ Why do coated ropes allow the designer to specify lighter empty car weights when compared to when using conventional steel wire ropes?

The cost of PU-coated ropes compared to conventional ropes can vary depending on a variety of factors such as the type of rope, length required and specific application. PU-coated ropes typically have a higher upfront cost than conventional ropes due to the specialized manufacturing process and the use of high-performance materials. However, the improved durability, minimal maintenance requirements and extended service life of PU-coated ropes can result in significant cost savings over time. Additionally, the use of PU-coated ropes in high-performance applications such as elevators can improve safety and reliability, reducing the potential costs associated with downtime, maintenance and repairs.

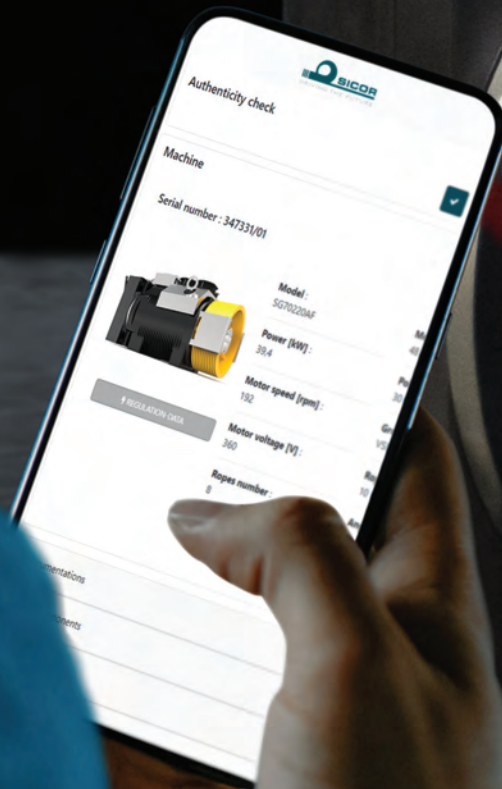
In summary, the use of PU-coated ropes in elevator applications offers many advantages, including high tensile strength, low elongation, excellent abrasion resistance, weight reduction and minimal maintenance requirements. The combination of these properties results in an elevator system that is more energy-efficient, has a longer lifespan and requires less maintenance compared to one with traditional ropes. The ability of PU-coated ropes to operate with smaller sheave diameter to rope diameter ratios and the elimination of the need to seize the rope ends when cut further add to their appeal for elevator applications.

Pat Dreps is vice president of quality and engineering at Brugg Lifting North America (BLNA).

Joseph Thompson is president and general manager of BLNA.

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PU-Coated Ropes as Elevator Suspension Means

This Technology article looks at the European experience.

by Nicola Imbimbo

Introduction

Elevator suspension means have mostly remained unchanged for more than 165 years. In 1834, a steel wire rope was first conceived for a mining elevator in central Germany. Since then, the product has been subjected to technological evolution, but basically remained in the form of wire rope until the beginning of the 21st century.

Coated steel belts were introduced as a suspension means, and only a few years after, the so-called “small diameter” alternative appeared on the market. It completely changed the landscape of modern elevator design. Well, let’s not forget that just after the latter, polyurethane (PU)-coated ropes had started to appear, as well, joining together the benefit of the elastomeric-coated suspension means and small diameter ropes.

At this point, we must pose to ourselves a driving question: Why do we have to complicate our lives as elevator designers by introducing alternative suspension means into our projects? The objective of this short article is to properly address the answers to this question. Follow along as we delve deeper and explore this matter.

The European Experience

For this exercise, we are in European territory where the average elevator is suited for an application in a building defined as low rise, low speed (maximum 10-15 floors, with a speed of up to 1.6 m/s), and in which the space available holds historical significance.

The average European elevator has a capacity of 630 kg (eight person payload), and based on the EN 81-20/50 technical rule, the minimum wire rope diameter shall be ≥ 8 mm with a minimum bending ratio over the sheaves of 40:1, bringing the traction sheave diameter to ≥ 320 mm.

With these minimum values in mind, we proceed into the elevator design phase understanding that, with such narrow spaces available, the only way to increase cabin dimensions is

to reduce the size of the motor, and to accomplish that, there is only one way: lean toward small-diameter suspension means (to be compliant with Lift Directive 2014/33/UE, small-diameter suspension means can only be applied on elevators if accompanied by an Examination Conformity Certificate issued by a Notified Body).

Understand motor torque, and consequently motor dimensions, are directly proportional to the traction sheave diameter. The larger the sheave, the higher the torque requested and the larger the motor size (motor size will be directly proportional to torque requirements). Inversely, the smaller the sheave, the lower the ampere requested by the motor, requiring a smaller inverter. It is comparable to the domino effect.

“The Bucket Challenge” exercise helps simulate this topic and the physical relationships discussed (Figure 1). Imagine holding two buckets full of water with your arms positioned flat

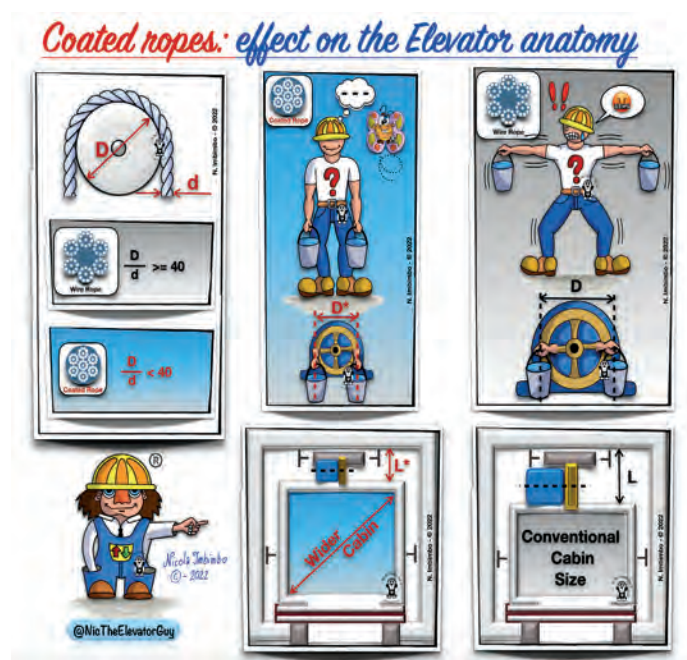


Figure 1: The Bucket Challenge

at your sides; you'd be able to stand in this position for quite a long time. Now, raise your arms upward into a horizontal position. You won't be able to stay in this position for too long. Correct, but why? Your shoulders have just experienced "torque," and, similarly, this is experienced by the motor with the traction sheave diameter (Figure 1).

As shown, it is evident that small-diameter suspension means can accomplish this task. Not only is it a space-driven advantage, but cost-driven as well, considering that motors and inverters are among the most important cost-heavy items in low-rise, low-speed elevators.

In conclusion, at the same cabin travel speed, if the traction sheave diameter is reduced, the motor shall rotate at a higher speed (RPM). This will bring the motor itself to operate in a range in which energy efficiency is increased (Figure 2).

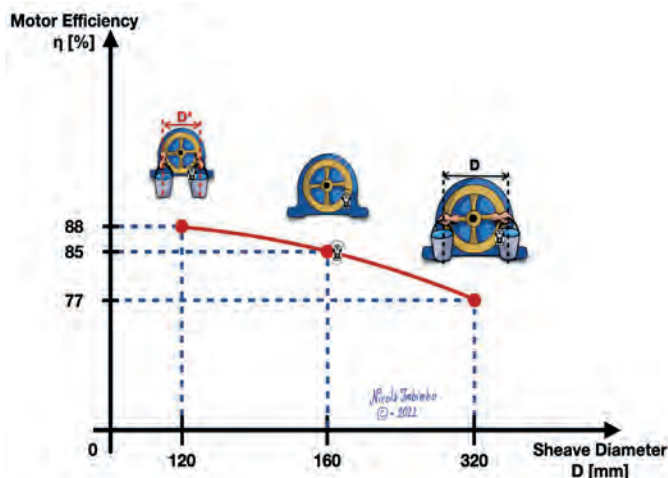


Figure 2: Variations of motor efficiency, at the same cabin travel speed, changing the traction sheave diameter (purely indicative values, based on motor manufacturer's literature).

Example: A bank of elevators suited for a 10-15 floor building, in which you would nominally require four elevators (630 kg, eight person payload) to fulfill traffic handling during peak hours. All of this is based on a conventional elevator design with a rope d. 8 mm and a traction sheave diameter of 320 mm – minimum.

Switching to small-diameter suspension means and reducing the traction sheave diameter to 120 mm with the aid of PU-coated ropes in the same shaft dimension, you can theoretically install an elevator with a payload of at least 750 kg (10 person payload), leading you to install three elevators instead of four.

Not only would this configuration save the cost of an elevator installation, but it also benefits building designers and owners by providing additional apartment or office space.

It is worth noting that this is intended as a purely theoretical exercise, which does not consider many boundary conditions. It is an experiment that could give us guidance in understanding

the philosophy of using coated suspension means and small diameter ropes.

Coated Vs. Uncoated

Why would it be necessary to move into elastomeric-coated wire ropes instead of conventional wire ropes?

If you are an elevator designer, you are most certainly familiar with the concept of minimum number of ropes required, the effect of specific pressure and how they affect wire rope service lifetime.

Consider when reducing the traction sheave diameter with small-diameter wire ropes (not coated) for suitable traction, V-hardened traction sheaves must be used. These grooves are quite aggressive toward reducing the wire ropes' lifetime, and although not required by code, it is recommended to perform a specific pressure verification and adjust for reasonable service lifetime.

Remember, codes are safety rules, and do not describe lifetime requirements. Further considerations must always be made.

For comparison purposes, refer to the previous example of a 630 kg elevator (eight person payload) with a reeving arrangement 2:1, and a reduced dimension traction sheave (120 mm), in which we are going to apply two different suspension means: 1) d. 6.5 mm 8x19W+IWRC, and 2) d. 6.5 mm PU-coated ropes.

In the first case with V-hardened grooves, we would need to use eight to 10 ropes to gain a suitable lifetime. While in the second case, with PU-coated ropes and U-plain groove, the same elevator can use three to four ropes. The greatest difference between both scenarios is that the lifetime of the coated ropes will far exceed that of the ropes that are not coated.

By this comparison, it is quite clear the PU-coated ropes bring many design advantages. Lastly, the PU-coated ropes have no patent limitations and can be used in any elevator configuration.

Application Recommendations

Having clarified the advantages of PU-coated ropes, it is important to read and understand the user manual supplied by the manufacturer. This will provide all the design elements that should be considered during the development of the elevator project.

As for conventional steel wire ropes, the amount of historical data and reference material compiled for elevator applications exceeds 180 years, which is lacking for PU-coated ropes. Every combination of coated suspension means and traction sheave is to be tested to ensure verification of the actual f factor.

Please be aware of the difference between μ and f : μ is the friction coefficient between the materials, while f is the apparent friction factor obtained by laboratory experiment that

Continued

By this comparison, it is quite clear PU-coated ropes bring many design advantages. Lastly, PU-coated ropes have no patent limitations and can be used in any elevator configuration.

takes into consideration the groove geometry, the surface finishing and any other element that will affect traction.

These initial values are obtained in a lab setting, then tested with the prototype elevator, as f factor results could vary depending on the configuration, shaft efficiency and materials used. For this reason, it is recommended that a prototype elevator is built to perform all the necessary experiments before introducing the final elevator into the market. Environmental conditions must be considered, as well. It is not the intent of this article to cover every aspect. Please refer to the manufacturer's user manual for more detailed information.

Please remember, PU-coated ropes require a different mindset compared to conventional wire ropes. To get the best benefit of their characteristics, you must manage them properly, starting with handling and care: PU materials are very sensitive to environmental conditions and to the cleanliness of contact points. Handle them with clean gloves, and do not

make contact with any source of lubricant or grease. Once contaminated, it will be very difficult to clean properly. This will degrade the PU-coated rope and cause slippage (Figure 3).

PU-coated ropes need to remain clean, and if necessary, a periodic cleaning should be performed with a specific product recommended in the user manual of the manufacturer. Following the above recommendations will allow you to get the most from your PU-coated ropes.

Conclusion

The elevator industry is continuously evolving while integration of new sustainable materials brings cost and energy savings to new and exciting innovative solutions. In this respect, the benefit of the PU-coated ropes can support this trend, providing the ability to implement designs that were not previously possible.

As with all new technology, the different characteristics of PU-coated ropes should be taken into consideration during the project development and design stage. It is equally important to maintain strong communication and a good working relationship with suppliers, who will be able to provide guidance in the proper application of their product.



Nicola Imbimbo is the Global Applications manager for Prysmian Group's Elevator & Escalator Business Unit. He began his career in the vertical-transportation (VT) industry as an apprentice for his family business, Imbimbo Ascensori, which was a FIAM elevator dealer at that time. He earned a degree in mechanical engineering from Polytechnic of Turin in 2001 with an experimental thesis dedicated to non-destructive monitoring of wire ropes. Upon graduation, Imbimbo served as a design engineer with an international manufacturer of specialty elevators. Prior to joining the Prysmian Group in 2011, Imbimbo worked as a technical application engineer with a few leading international companies involved in the production of wire ropes for lifting and transporting people.

Imbimbo is an active member of international working groups for the technical standardization of the elevator sector and has published numerous articles and delivered speeches at forums dedicated to VT. He is the co-author of a few books dedicated to elevator design and technical training and has trained operators, technicians and inspectors throughout Europe on rope-based systems designed for lifting and transporting loads and people.

In his spare time, he teaches training courses for the elevator industry as an independent consultant and is active on social network platforms where he publishes content related to the elevator and escalator sectors. Imbimbo is also the creator of the character "Nic The Elevator Guy®".

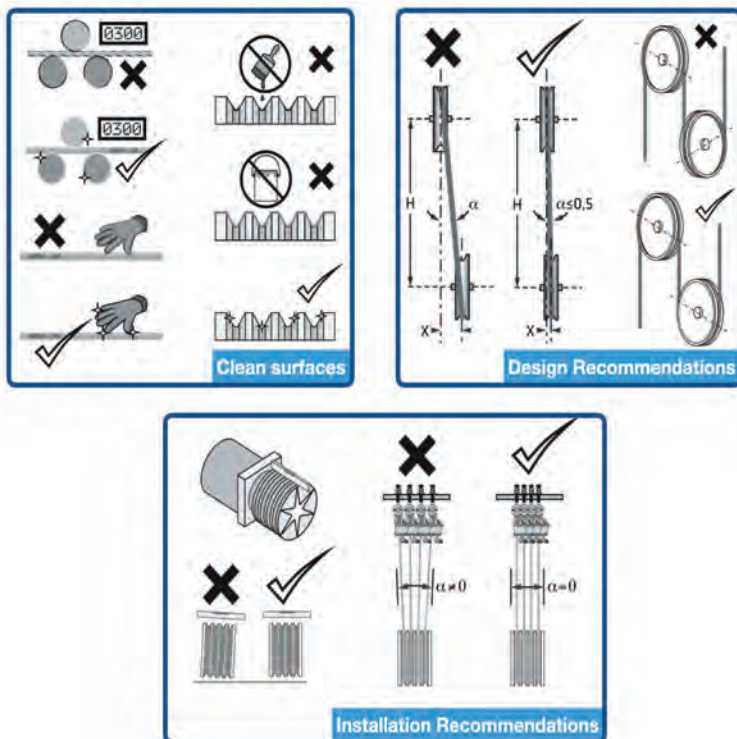


Figure 3: Recommendations from DRAKA EHC PU-coated ropes user manual



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Focus on Suspension
Means and Materials

Vertical Transportation Space Era: From Science-Fiction to Viable Engineering Solution and an Emerging Market



by Yuval Valiano-Rips and Maya Glickman-Pariente



This paper was presented at the 2022 International Elevator & Escalator Symposium in Barcelona, Spain.

1. Abstract

The Space Elevator is a well-known concept for a cable-based vertical transportation (VT) vehicle from the ground up to the geostationary orbit. For the past century, science fiction authors and scientists have discussed this challenge that has yet to be achieved.

Though the possible market for a Space Elevator is huge, the materials needed for the construction are still to be commercialized and the technology needs to mature.

In parallel, a new market for VT will emerge in the early 2030s with missions to the Moon and Mars, in which elevator companies must take a leading role.

Few space programs have already been initiated and funded to build human settlements on the Moon, Mars and beyond. The major program is the “Artemis” international mission, led by NASA, which includes building habited base camps on the surface of the Moon by 2025, and Mars by 2035.

These new settlements will need different types of VT solutions – both for people and for cargo.

Dealing with challenges, such as taking huge amounts of equipment down (and up) from vertically landing spaceships to the surface, vertically transporting materials needed to support the camp from underground mines or just traveling from the

surface to the safety of the underground habitat, require us to reimagine elevators: different gravity force, different atmosphere density and composition, stronger radiation and other challenges our industry should start addressing.

These new VT use cases are joined by new space-era hotels already being planned by several companies. Space stations built for fancy vacations in Low Earth Orbits (LEO) around earth would also need solutions to transport people around.

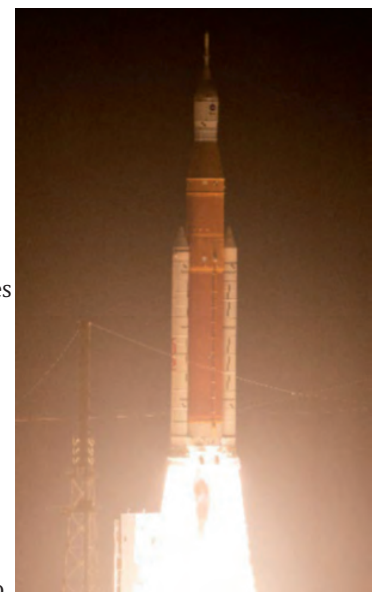
Space-related industries, train or car industries or other technology companies could solve these problems. But we believe the VT industry must be ready to encounter these next decades’ needs before any other industry takes the lead.

In our paper, we have researched the challenges for this new market (space environment, market opportunities, current architectures, etc.) and propose different solutions with a roadmap for elevator companies that want to launch their business to space.

The elevators’ role in the new space era is currently tackled only by space-related companies that understand space, but not elevators.

The paper’s main conclusion is that now is the best time for elevator companies to start R&D of the relationship between elevators and the space environment to achieve space-proven elevator modules ready for installation.

This paper is a call to action for our industry.



NASA's SLS rocket in the first Artemis program launch to put man back on the Moon; image taken on November 16, 2022, by NASA



(Left): SpaceX “Starship” 120-m height booster and vertical lander; (Right): A rendering of “Starship” landing on the Moon, as a part of NASA’s Artemis program



Artist's impression of SpaceX's plan for a Mars colony; image by SpaceX

2. Paper Motivation – Elevators and the New Space

For the past 20 years, there has been a constant human presence in space. In the upcoming decades, we will enter the era when humans begin their first steps as a multi-planetary species. Human habitats on the Moon and Mars are already being planned. These facilities will need VT solutions for unloading equipment, supplies and people from the landers into craters, lava tubes and caves under the surface, and for operating undersurface activities, where we will harvest the Moon and Mars ground for underground ice and construction materials. Larger and larger spaceships and space stations – some are planned as massive “space hotels” – will also need to transport people for long distances both vertically and horizontally.

2.1 Our Holistic View

In the upcoming years, we are going to see increasing demand for VT solutions used in extraterrestrial environments: the Moon, Mars and space hotels. Thus, we believe that now is the time to build the concepts, find the materials and create the designs that will fit all requirements of those elevators.

A commercial environment for space-proven elevator materials and components will start to evolve in this decade, and the elevator industry worldwide must be a part of this important effort. If we will not take the lead, a different industry will take the role of planning and building these transportation solutions: space industries, train companies or other tech or transportation industries.



Space Elevator illustration

Furthermore, creating and testing elevator-related materials and products for the space industry will boomerang (spin-in) back to the “regular” elevators here on earth by introducing stronger, lighter and more efficient elevator materials, components and processes here on the ground.

2.2 What Is Already Under Construction?

Each space company or organization that plans to land humans or cargo on another celestial body builds its VT solution according to the requirements they define to fit its vehicles and missions. Some of the current space-based architecture that will need some sort of extraterrestrial elevator is SpaceX (plans to land humans on the Moon by 2025 and on Mars by 2035 using its “Starship” fleet), NASA (plans to land humans on the Moon in 2024) and more to come.

Other visionary plans include space hotels that will need some sort of vertical and horizontal transport solutions. In the future, they will most definitely employ artificial gravity using centripetal forces, and then VT solutions will be crucial.

3. The Challenge

When people think about space and elevators, the concept of a Space Elevator (or the Moon Elevator) always comes to mind. But there is a much more urgent transportation solution that will be implemented in this decade: VT solutions for landers on the Moon and Mars. These landers, which land vertically, stand 30-50 m high and can have many levels of storage, will need VT solutions to load and unload equipment and people on the surface of the Moon and Mars.

In the following decade, we plan to see larger and larger space bases and even colonies on the Moon and Mars, probably partly underground or in large caves and lava tubes. These human habitats will need elevators suitable to the harsh environments and needs. These colonies will mine and harvest as many materials as they can from the local ground since delivery of goods from Earth is very expensive. These working fields and quarries will also require VT solutions.

Further in the future, by the end of this decade, we could expect larger space structures being built, even for recreation, with or without artificial gravity. They, too, shall need elevators and moving walks.

4. Space Environment Challenges

Space is one of the most extreme environments imaginable. Outside the protective atmosphere of the Earth, objects are subjected to extremes of temperature, both hot and cold, fast temperature gradients and a significantly increased threat of radiation effects. The vacuum in space is also a great challenge for humans and materials due to a phenomenon called “outgassing.”

The first extreme condition a spacecraft must deal with is that of the launch. All spacecraft and humans are launched to space by rockets. The rockets and spacecrafts need to carry tons of propellants to give them enough energy to escape Earth's gravitational pull. Because of the pull of Earth's gravity, the larger and heavier the objects you want to get to space, the bigger and heavier the rockets and propellant will be. The rocket that places the spacecraft and/or satellite into orbit will

Continued

also generate mechanical shocks and vibrations and batter it with extremely loud sound waves.

Temperatures in space, or on the Moon, can range from extremely cold, nearing absolute zero, to many hundreds of degrees above when in direct sunlight. On top of that, the temperature gradients are extreme, reaching around 200°C/min.

Radiation from our own Sun, and from other stars in the universe, can be extremely dangerous to electronic equipment due to energetically charged particles such as electrons, protons, alpha particles and gamma rays, and also can cause atom displacement or long-lasting total ionizing dose effects.

4.1 Materials in Space

Space's (or the Moon and Mars) environmental effects on materials are very severe and complex because of the synergistic interaction of orbital environments such as high-energy radiation particles, atomic oxygen, micrometeoroids, orbital debris and ultraviolet irradiation interacting synergistically, along with thermal exposure. In addition, surface degradation associated with contamination can negatively impact optics performance. In an elevator case, the suspension cables, the car and other components will all be affected by the harsh space environment. Thus, elevator designers must have a deep understanding of the specific environment in which the elevator will operate, enabling the appropriate selection of materials to maximize safety and engineering performance, increase mission lifetimes and reduce risk.

Space missions require materials that can preserve functional integrity under extreme heat, thermal gradients, impacts and radiation. Some of the materials used in space are aluminum, nickel, titanium and their alloys, steel and filler materials; Kevlar, silica and silica-based materials, polymers based on acrylic and methacrylic polymers, polycarbonate and some polystyrene grades.

5. Call for Action

During the writing of this paper, we have met with some of the most dominant people in extraterrestrial elevator-related organizations. They all agreed that this is the time for the significant elevator companies to step in and take an essential role in designing these new, groundbreaking VT solutions and lead the way for building the ecosystem of space-proven elevator components and materials to support the future of VT in the New Space era.

6. The Space Elevator – History and Science Status

6.1 What Is a Space Elevator?

We can't write this paper without being reminded of the Space Elevator concept that has excited the minds of researchers and sci-fi authors for decades and up to the point of writing this paper, was the sole connection of elevators and space fields.

The Space Elevator is a 100-year-old concept for a cable-based (tethered) VT vehicle, anchored to the ground and

stretched up to the geostationary orbit, which is about 35,800 km above Earth's equator. At this altitude, an object in orbit will appear stationary, which means it will stay almost above the same point on earth's surface.

Thus, a light and strong enough cable (tether) lowered from an object at the geostationary orbit and anchored to the surface of the earth will remain under constant tension, and the object will rotate right above the anchor.

In the past, the Space Elevator was considered as nothing more than a science fiction idea, but due to much research done in the last decade and technology improvements, we are closer now to the moment when this idea can become a reality.

6.2 Why Can't Humanity Keep Using Rockets Forever?

Currently, humankind's only alternative to elevate payloads into orbit is to use rockets, which is risky, extremely polluting and expensive.

Table 1 shows an assumption of humanity's space delivery requirements in metric tons per year for some estimated major projects that should reach maturity in those years.

| Demand in Metric Tons | 2031 | 2035 | 2040 | 2045 |
|-----------------------------------|---------------|----------------|----------------|----------------|
| Space Solar Power | 40,000 | 70,000 | 100,000 | 130,000 |
| Nuclear Materials Disposal | 12,000 | 18,000 | 24,000 | 30,000 |
| Asteroid Mining | 1,000 | 2,000 | 3,000 | 5,000 |
| Interplanetary Flights | 100 | 200 | 300 | 350 |
| Innovative Missions to GEO | 347 | 365 | 389 | 400 |
| Colonization of Solar System | 50 | 200 | 1,000 | 5,000 |
| Marketing & Advertising | 15 | 30 | 50 | 100 |
| Sun Shades at L-1 | 5,000 | 10,000 | 5,000 | 3,000 |
| Current GEO satellites + LEOs | 347 | 365 | 389 | 400 |
| Total Metric Tons per Year | 58,859 | 101,160 | 134,128 | 174,250 |

Table 1: Source: August 28, 2020, presentation by Michael (Fitzer) Fitzgerald – chief architect for International Space Elevator Consortium (ISEC) (This table is lacking Starlink satellites, which already placed more than 750 T of payload in space.)

Even though rockets get more and more efficient, they all must comply to the Tsiolkovsky rocket equation:

$$\Delta v = v_e \cdot \ln \frac{m_0}{m_f} = I_{sp} \cdot g_0 \cdot \ln \frac{m_0}{m_f}$$

Where:
 Δv is the maximum change of velocity of the vehicle (with no external forces acting)
 m_0 is the initial total mass, including propellant, "wet mass".
 m_f is the final total mass without propellant, a.k.a. dry mass.
 v_e is the effective exhaust velocity, where:
 I_{sp} is the specific impulse in the time dimension.
 g_0 is standard gravity.
 \ln is the natural logarithm function.

Thus, all rockets still require a large amount of fuel to get a fraction of the rocket's mass to space. We can look on the next example for a moon landing rocket:

Total rocket mass at liftoff = 100%, out of that:

- ◆ The booster stages + fuel to reach LEO is about 95%
- ◆ The mass of the fuel and engine to get to GEO (Geostationary Earth Orbit) is about 1.6%
- ◆ The mass of fuel for insertion to the Moon's orbit is about 1.5%
- ◆ The mass for deorbiting and landing on the Moon is about 1.4%

Continued

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Final mass on the Moon is only 0.5% from the rocket's initial mass!

Moreover, rockets contribute to global warming due to CO₂ emission in the atmosphere.

Much research has been done on the subject in previous years by many space-related agencies, companies, universities and other organizations – such as International Space Elevator Consortium (ISEC), which is a leader in the field today, LiftPort Group that leads moon-anchored Space Elevator concept and research, NSS (National Space Society), NASA, European Space Agency, Japan Aerospace Exploration Agency (JAXA) and many more – that have joined the engineering effort for a Space Elevator.

In 2018, JAXA, together with Shizuoka University in Japan, sent a cube-satellite based Space Elevator experiment to space that included driving a miniature elevator car between two satellites using a cable.

In the past 15 years, there have been many competitions for developing Space Elevator components, led by X prize, JSEA (Japan Space Elevator Association), BASPEC (Bavarian Space Elevator Challenge) and many more.

mass of the cable is very hard to estimate accurately since it's dependent on the final architecture of the entire system. Under reasonable assumptions of the architecture, the acceptable strength needed for the cable is about 50 GPa (that is 50,000 MPa, which is more than 490 atmospheres), so steel cables or any cables used for elevators on Earth today are not strong enough.

Another newly researched material that might be the answer is single crystal graphene. As with carbon nanotubes, single crystal graphene is one of the now-researched materials that can withstand the extreme tension requirements, mainly because it's a 2D material that is about a molecule thick (sometimes referred to as "a macro scale molecule"). Thus, its weight is almost neglectable even for many kilometers of length. These sheets of material have been successfully researched to be highly durable, strong and fatigue-resistant and are now tested in longer and longer lengths and manufacturing rates – currently tested for tensile strength of 130 GPa.

6.4 Autonomous Maintenance

Since the Space Elevator is going to be exposed to the harsh space environment, including radiation and small space debris impacts (i.e., anything from small meteoroids to manmade space junk that is in orbit around the Earth), it is crucial to have smart, fast and autonomous maintenance mechanisms and other protections for the entire structure, including the cable (tether) of course, but also for the cars (the climbers), the anchors and the power supply.

As we all unfortunately know, elevators can have crucial safety incidents occurring during their lifetime. Emergency safety operations are a major challenge when the cable is more than 35,800 km long and the elevator's car is moving at extremely fast speeds needed to make this long journey in a reasonable time frame of a day or two. To minimize risks, effective, fast and autonomous maintenance solutions that incorporate elaborated predictive maintenance must be developed.

7. The Bottom Line

All these challenges and more need to be addressed by the elevator industry, which has decades of experience in safely and vertically transporting people, supplies and equipment and must take a major part of the New Space Era of humankind. If we wait, we might miss the elevator!

We combined our skills to launch elevators outside of Earth's atmosphere, to the new space era and welcome all elevator and space companies that want to join the initiative.

Continued

6.3 Space Elevator Architectures

Since the Space Elevator was originally suggested, many different architectures have been researched and published. Almost all of them include the same basic four components:

1. The base station – an anchor to the surface
2. The counterweight – an orbital space station.
3. The tether (the main cable)
4. The climber (the elevator car)

One of the main challenges was finding a cable material that could hold the extreme tension forces but also withstand the harsh space environment. Until the last

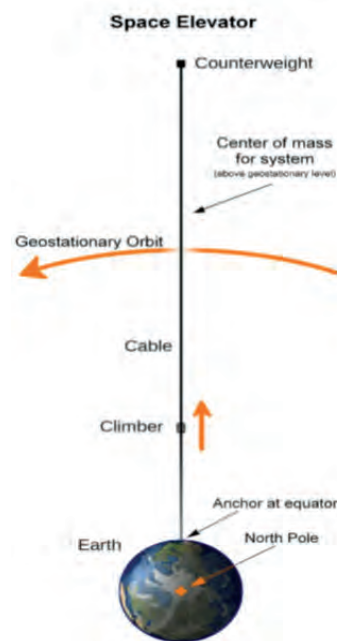
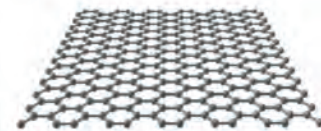


Image of Space Elevator architecture: Wikipedia (image not to scale)

few years, the main target material was carbon nanotubes. These nanometer tube-like strands, if they are pure and without any defects, could comply with the tension requirements. But, even after decades of R&D in many research labs around the globe, there is still no one who knows how to manufacture a pure enough material for more than a few dozen centimeters long, not to say thousands of kilometers. Still, carbon nanotubes are being researched and manufacturing methods are improving over the years.

Since the cable of the Space Elevator must support its mass against Earth's gravity all the way from the ground to the geostationary orbit and further into space, the tensile strength of the cable is a major challenge that is being researched. The

Carbon nanotube
One Dimensional material (1D)



Graphene
Two Dimensional material (2D)

Webinar by Adrian Nixon, editor of *The Nixene Journal*, May 2020



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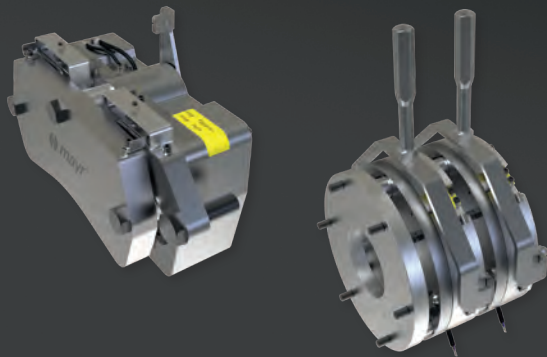
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- [10] During the preparation of this paper, between 2021-2022, we have had related meetings with:
 - Dr. Pete Swan, president of ISEC
 - Dr. Eliad Peretz, lead researcher for New Space Missions at NASA Goddard Space Flight Center.
 - Mr. Michael Laine, president, chief strategic officer of LiftPort Group
 - Many other space and elevator-related professionals who shared with us their perspective for elevators in the space era.

Yuval Valiano Rips is the VP of Engineering of Rips Elevators Group and has extensive experience in elevators and space-engineering related fields. He has a B.Sc in computer engineering and applied physics from the Hebrew University of Jerusalem, Israel, as well as in practical machinery engineering and a master's in business management from the Raichman University in Herzlia, Israel. He is the publisher of Israel's only elevator engineering book. After almost 20 years in the defense sector in space-related fields, he is now both a space engineering consultant and astronomical observatory manager in the city of Netanya, Israel, and a part of the managing team of Israel's Space Agency organization. He can be reached at yuval@rips.co.il.

Maya Glickman-Pariente is the co-founder and CEO of SPACECIALIST Ltd., a private space-engineering company, and has more than 25 years of experience in space missions planning and satellite operations. She has a B.Sc. in aerospace engineering and an M.E. in systems engineering from the Technion and is an ISU (International Space University) summer session program 2004 alumnus. She has been working in the aerospace industry in Israel since 2000 and was satellite engineer for AMOS communication satellites (AMOS-1, AMOS-2, and AMOS-3), and RnD (Rendezvous and Docking) mission analyst for Effective Space Solutions (now Astroscale IL). Today, she oversees all space operations and constellation optimization for Sky and Space Company (former Sky and Space Global, SAS). She can be reached at maya@spacecialist.com.

Rips Engineering LTD. is part of the Rips Elevators Group, which has been active in the Israeli VT market for more than 35 years. Its engineers provide safety inspections, planning and consulting for all types of elevators.




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FIERA MILANO

Opportunities for All

How Otis is addressing a labor shortage through supporting women.

by Dot Mynahan and Erika Goldstein

In the past few years, Otis redesigned professional uniforms and invested in new safety equipment — all to accommodate a growing group of people finding valuable and meaningful work in our trade: women. Why are women finding great opportunities working on elevators? It's a job that:

- ◆ Is interesting and fulfilling. You keep the world moving, and billions count on elevators and escalators every day.
- ◆ Pays well, even while you're in training.
- ◆ Doesn't always require an expensive college degree.
- ◆ Provides an up-close view of the inner workings of some of the busiest transportation hubs and tallest buildings in the world.
- ◆ Is being shaped by modern technology. As our industry transforms from mechanical to digital, so too are the skills required to service elevators and escalators.

And you can see the immediate impact of your work — helping people get to where they need to go, safely, every day. Chor Man Yan, a modernization mechanic in Hong Kong who turned her passion for mechanical engineering into a career with Otis, says:

“When you love your job, you will be more devoted and willing to learn. Every time I see customers satisfied with the new equipment and enjoying a comfortable and safe ride, I am affirmed that my profession made a difference in their lives.”

Still, there's a shortage of elevator field technicians in almost every part of the world. To meet customer and passenger needs, we need to hire the best people from the biggest talent pool — a pool that includes all genders.

With this year's International Women's Day (on March 8) theme of Embrace Equity, we think it's time to talk about why this is so important, and what companies like Otis can and should do about it.

“We Want More”

It's still too common that women are not encouraged or fail to consider stepping into this traditionally male-dominated trade. Championed by a female CEO (Judy Marks), Otis is embracing diversity as we press for changes within our organization and industry.

Eveline Schmid, who works in Austria as an electrical technician and specializes in modernization engineering, observes:

“Many women are curious about technical professions, but ultimately don't dare, because the cliché, ‘technology equals a man's job,’ just won't go away that easily. I experience this personally when I am asked what I do for a living and say, ‘I'm an electrical technician.’ Then the reaction is often, ‘What?



(l-r) Dias and Chaudhury

How? You? I'm proud to show others that there are women in technical professions, and we want more!”

Schmid's comment echoes what we hear around the organization: It is empowering to be one of the few women on an entire jobsite, managing a complex project and succeeding in what others thought was a man's job.

What Is Otis Doing?

To make a difference, Otis and companies like it must listen to and support women in the field, nurture a culture of allyship, and make diversity a cornerstone of hiring and training.

It's about more than diversity for its own sake. Diversity is good for business. Studies show that companies with ethnic and racial diversity in management earn higher returns, and diverse teams are more successful and more innovative. We apply this to our service business, which makes up 80% of Otis' profits, and the business opportunities are real.

In 2016, one of your authors (Goldstein) was the director of field operations in Singapore and the other (Mynahan) was the director of field operations in Latin America. They met each other at a global safety meeting in Berlin, and recognized an opportunity to identify, mentor and support other women in field operations. The company elevated its profile and supported them in making changes big and small. That's how the FORWARD employee resource group was born, to promote the retention and advancement of female employees within Otis Field Operations. And the company is proud that it has since grown to more than 500 members globally, including women working in the field and allies.

Otis is a leader — not just in our industry but in construction trades generally — supplying uniforms and critical equipment like gloves and fall protection safety harnesses specifically

It is empowering to be one of the few women on an entire jobsite, managing a complex project and succeeding in what others thought was a man's job.



Yan



Schmid

designed for women. In North America, Otis sponsors women field employees to attend Tradeswomen Build Nations, an annual conference dedicated to supporting women in the building trades. And Otis has supported your authors in nurturing a culture of sponsorship, mentorship and allyship.

To make meaningful progress toward our diversity goals, a next step is to set serious diversity targets for training and apprenticeship programs. One example of this is Otis' Rota Escola, or "Route School" in Brazil, which provides on-the-job training and experience while students complete their education. Most graduates are offered jobs at Otis. The program has met its target of gender parity – 50% women – each of the last five years, building a critical talent pipeline.

Programs like Otis' Rota Escola can realize meaningful progress on gender diversity in the trades, broadening the

Staying Connected in India

As many aspects of our work and our industry transform from mechanical to digital, so, too, do the skills required to service our elevators and escalators. Manisha Chaudhary, a field supervisor in India, has witnessed this firsthand in a role where her passion for both mechanical and electrical technologies meet. Chaudhary says:

"A big part of my role is visiting sites for technical troubleshooting. Sometimes you work with something more primitive, like a relay-based controller. But I also get exposure to the latest technology through Otis. It's better than what I could have imagined."

One of those innovations is Otis ONE™, an IoT solution that connects customers' elevators to the cloud to deliver a more seamless passenger experience while aiding service technicians to proactively address performance issues. Through real-time Otis ONE performance data, mechanics may know an elevator isn't working before people in the building or the customer does.

How does Chaudhary stay connected? Through a more common technology – a smart phone and a suite of apps. The phones and related tools and apps have digitalized many formerly paper processes and provided access to product data, maintenance history and diagnostic tools that help Chaudhary and others operate more efficiently.

talent pool, providing better, higher-skilled services to customers and helping businesses. Mirela Dias, who joined Otis through the Rota Escola program and now works as a service technician in the Otis branch in São Paulo, Brazil, says:

"Otis gave me several opportunities to gain experience and the confidence I needed to do my job. I have always had a great relationship with customers, but I know that the prejudice against women professionals still exists. My advice is to not give up on your goals. Show that a woman's place is anywhere she wants to be."

Yan, Schmid, Dias and the other Otis women in the field make it clear: Women are excellent elevator mechanics. And we need them.

Dot Mynahan is executive director of Field Operations and Safety for Otis Americas.

Erika Goldstein is senior director of New Equipment Field Operations for Otis globally. In 2017 with Mynahan, she co-founded the Otis FORWARD employee resource group, which provides mentorship and support for women in field operations.

“Is There Even MORE?”

3D printing in elevator manufacturing

Your author, Undine Stricker-Berghoff (**USB**), recently talked to Oliver Simmonds (**OS**), graduate engineer (University of Applied Science) in mechanical engineering and principal engineer at Schindler in Ebikon, Switzerland. In the interview, the main topic was 3D printing as a potential future production technology in elevator manufacturing. You will get an insight into the first applications at Schindler including their 3D printed car, tests, results and a rough prognosis for the future use of this technology.

USB: Mr. Simmonds, could you please tell us about your personal and professional background?



Simmonds; courtesy of Schindler

OS: I am a mechanical engineer, educated at the University of Applied Sciences Northwestern Switzerland. I started my career as a machinery draftsman. This is the third time I have worked with Schindler, in total more than 15 years. Immediately after graduating, I worked here on the development of safety gears for high-speed elevators. After that, I worked outside in start-ups on e-mobility and yacht architecture. I

worked independently at one time to advance the technology of electromobility; at that time, I also had orders from Schindler.

Now, on my third go on the development side, I'm more involved with the research of new technologies. I follow up on technologies and look at them closely, considering how to incorporate them into new products. Of course, I follow trends, but I look more deeply into the technology itself. I have discussions with manufacturers on the state-of-the-art to get to the core.

USB: Our general topic today is 3D printing in the production of elevators, escalators and their components. What is your actual personal involvement in this technical topic?

OS: I have had a strong personal interest in 3D printing for a long time, which fortunately I have been able to transfer to my professional environment. I promoted the topic at Schindler and then delved deeper into the question: “What might



3D CAD drawing of printed car; courtesy of Schindler

by Undine Stricker-Berghoff, EW Correspondent

Side view with mounted glass walls; courtesy of Schindler



originate out of it?” Doing this, I had my eye on more complex parts that could be manufactured in very small batches at an affordable price.

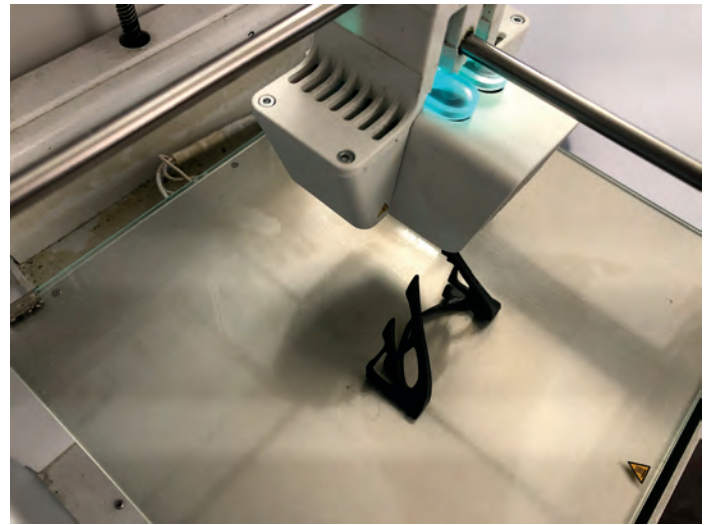
USB: Can you please explain what signifies the term “3D printing” as one form of additive manufacturing?

OS: The technology has improved greatly so it can be used for samples and small batches. There are X varieties of plastics and metals such as steel, copper and aluminum that need to be understood. The variety of materials and the correspondingly differing processes do not result in only one, single 3D technique. However, the common factor is always that material is built up in layers. Technically, these processes are referred to as “additive manufacturing.” However, the term 3D printing has become established in the popular language.

In the 1990s, the road began in the U.S. with the processing of powder on a type of inkjet printer. Resin was applied to a surface to bind the powder to the selected area. This is where the term 3D printing comes from.

Today, we mainly use the Fused Deposition Modeling (FDM) process, also called Fused Filament Fabrication (FFM). In this process, plastic is heated and pressed through a nozzle. The method is inexpensive, widely available and leads to good results. There is also the so-called powder bed process, which works with metal as well as plastic.

In our project, the car was built using the Wire Arc Additive Manufacturing (WAAM) process. A welding robot runs

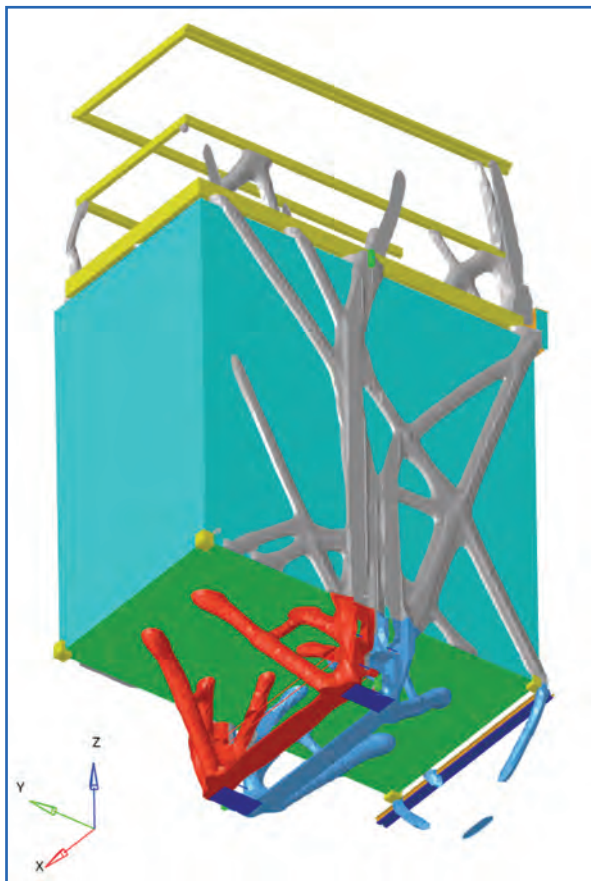


3D printers used by apprentices at Schindler; courtesy of Schindler



Installation robot Schindler R.I.S.E at work; courtesy of Schindler

Continued



Topology optimization of the car; courtesy of Schindler



Steel bridge in the city center of Amsterdam, The Netherlands, “printed” by MX3D; courtesy of MX3D

according to the design “drawing” and applies the material layer by layer.

USB: Behind these various calculation methods for optimization, I adumbrate a longer history.

OS: We’ve built up all this over the years, especially the design tool, always following the progress of digitization. We used to draw designs in ink. The enormous change has led to a largely paperless office. The entire work process has been digitized, which means that we no longer make drawings by hand for 3D prints either.

USB: In your company, you start with 3D prints very early on in the careers of your staff. Already for apprentices, you offer metal and plastic 3D printers as tools. What is the next generation doing with these printers?

OS: We believe that it is time to bring the process into everyday life. 3D-print technology has been available to everyone in the company’s R&D department for some time; small devices are placed in almost every office. The apprentices also need to know it. That is why we are already using the FDM process in our apprentice workshop. You can have a look at the printers and processes at schindler-berufsbildung.ch/de/dienstleistungen/konstruktion.html#c12_tabs-4d341ec6cd-item-1075e81d2b-tab.

USB: Why do you involve the next generation in this technology?

OS: Young people can already integrate 3D into their everyday work. They find it easier than some older people. If 3D is already part of everyday life in R&D today, it will accompany the next generation in production throughout their whole lives. It is important to prepare them for this.

USB: Back to R&D. At what stage in production or for which products do you see opportunities for 3D printing, and why?

Continued



Floor structure ready to be mounted; courtesy of MX3D



Assembled elevator car with standard car roof; courtesy of Schindler



Welding robot during the “printing” process of car parts; courtesy of MX3D

OS: We work conventionally in the production of elevator components by means of milling and lathing, also in plastic. For our Schindler R.I.S.E installation robot, for example, cover parts made of plastic would come into consideration. These would exactly meet the targeted niche: customized parts in small series. In larger quantities, 3D printing is still too expensive and too slow.

USB: What about spare parts?

OS: Generally, yes, but if plans are still available, they can also be produced quickly and inexpensively, computer-aided by conventional means. It has formerly been milled according to drawings, etc. Why should I change the process? The situation is different for old castings, for example, where molds are no longer available. These have usually more complex shapes that are difficult to produce by conventional means.

USB: And why is 3D printing not already used much more often then?

OS: The main difficulty in metal applications is the availability of reliable and reproducible material specifications. Many factors during the printing process must be controlled within narrow limits in order to achieve the desired quality. Often, only very specialized companies have these processes under control. Therefore, the obstacle to wider application is the lack of warranties and quality assurance measures. There are many approaches in this area, as well. The first printing system manufacturers are already issuing warranties. These materials are already being used in aircrafts and jet engines, for example, but still require bigger investments.

USB: As far as I know, you already tested printing elevator cars. Are there any other items on which you have already worked within Schindler?

OS: Before we created the car, we had realized 3D-printed casting molds for a motor housing. We were looking for a part with a topology that could be optimized using mathematical methods. This applies to the car; its design has the forces in the frame as a determining boundary condition. With the help of software, the structure of the car can be optimized.

The whole thing started with a study of what is possible with 3D printing in terms of optimization. It’s like a tree: Where it needs nothing to strengthen, there is nothing – the branches are thinner than the trunk. We didn’t draw the design, but calculated it. The result was optimal in the first stages, for



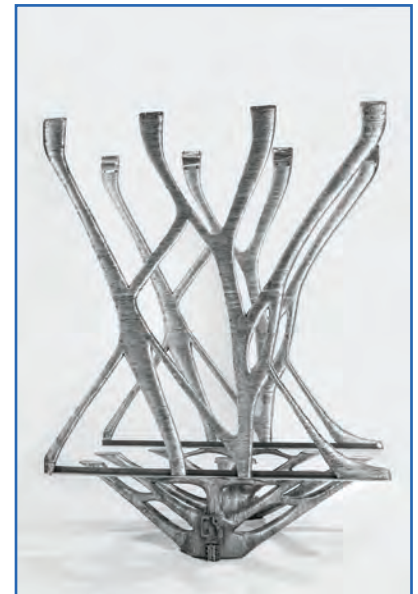
View from inside showing handrail mount, side and floor structure; courtesy of Schindler

example, in terms of the use of materials, which is much lighter, but it could no longer be produced conventionally.

The whole thing only became feasible with 3D printing. So, our main concern with the car was to demonstrate that it was feasible. Can 3D printing achieve the calculated material reduction? Yes, 3D printing can! Consider this car like a concept car in the automobile industry.

USB: Let’s go then into this specific car project. When printing elevator cars, you call it art. Could you please tell our readers what is behind this unexpected label?

OS: I clearly detect the “art of engineering” in this, just as it always gave technology an aesthetic face in the early days. In retrospect,



Finished printed structural elements; courtesy of MX3D

Continued

architects, too, used to be artists. Steam engines were decorated and painted. This aspect has been lost in industry. Everything became straight. Looks cost – and no one wants to pay for that.

3D printing brings together these two worlds. You can “slim down” and optimize, still keep the earnings high in the industry and the result is pretty to look at. There used to be beautiful mosaic floors. Today, with 3D printing, they’re feasible again. We will see many things once again.

What you develop as an engineer must also look good. This increases acceptance and sales figures in equal measure. For more information, have a look at group.schindler.com/en/media/stories/when-engineering-meets-arts.html.

USB: Who was in charge of the actual execution of the printing itself?

OS: The car is approximately 2.1 m deep X approximately 1.2 m wide X approximately 2.2 m high inside, with a superstructure even 3 m high in total. The printed parts were manufactured at MX3D in the Netherlands. There, innovative manufacturing processes based on industrial robots and wire welding processes are developed and tested. The company had also printed a steel bridge over a canal in Amsterdam before building our car. The steel was easier to process than the aluminum of our car. Printing large aluminum structures was new territory for everyone involved, which required a lot of input from everyone. Many tests were necessary in advance to achieve an acceptable result.

USB: Which metal did you use in this process?

OS: As previously mentioned, we used aluminum to realize a lightweight construction. Welding aluminum requires a lot of know-how. Plastic is much bulkier to achieve comparable strength. Steel also has minimum wall thicknesses, which makes it much heavier. However, we did not want to add unnecessary mass to the elevator system. Our exact goal was to build the optimized structure light. This would not have been reasonably feasible in plastic or steel. By using aluminum, we also wanted to inspire others.

USB: Which parts of the car were printed?

OS: We printed the structural elements of the car, that is, the floor and the sides. So, in total, three parts were produced: the floor, the left side and the right side. The floor, in turn, consists of four mirrored parts that were welded together afterwards. The two side parts were split horizontally and then welded together. It would also have been possible to make one large part each, but the assembly was easier than letting a 2-m robot arm handle the print. But we had some respect for the assembly. For example, the installation space for the floor structure was too small. The rest was put on afterwards, conventionally prefabricated. It consisted of a standard roof structure, glass walls and floor, as well as the door and its suspension.

This “printed” car did not run because the uncertainties are too high. Specifically regarding material safety, no verification is possible. It is walkable, but not drivable.

USB: What was the motivation behind this project?

OS: We aimed to learn the processes and the state of the art. Within the timespan of one year, we completed the calculations

Technical Specifications of the “Printed” Car

Width: 1,200 mm

Depth: 2,100 mm

Height: 2,140 mm

Load: 1125 kg

Weight of empty car: 850 kg

and the manufacturing. One and a half people in our house were actively involved in the project in this time [meaning that multiple people worked for one and a half years on the project at different times], plus the colleagues from the Netherlands.

USB: What was the outcome of the project?

OS: We have shown: “It can be done!” We have learned a lot – also about the limits and weak points. And, of course, we are now asking ourselves: “Is there even more?”

USB: What are your future plans concerning 3D printing at Schindler?

OS: At the moment, we have yet to set up a follow-up project due to the lack of quality assurance for the material. There is a lot of interest in the group to use 3D printing and to run the results in highly visible places. But it is in the nature of our work in the New Technologies Department that sometimes the time is not yet ready. We will continue to monitor the technology, and, perhaps, in a few years, we will move forward with it in concrete terms.

USB: Is there even more potential for 3D printing?

OS: Probably. In our Schindler magazine, we gave some information about a whole building which was already printed in concrete. You can find the article with more details at magazin.schindler.de/architektur/haus-aus-dem-3d-drucker.

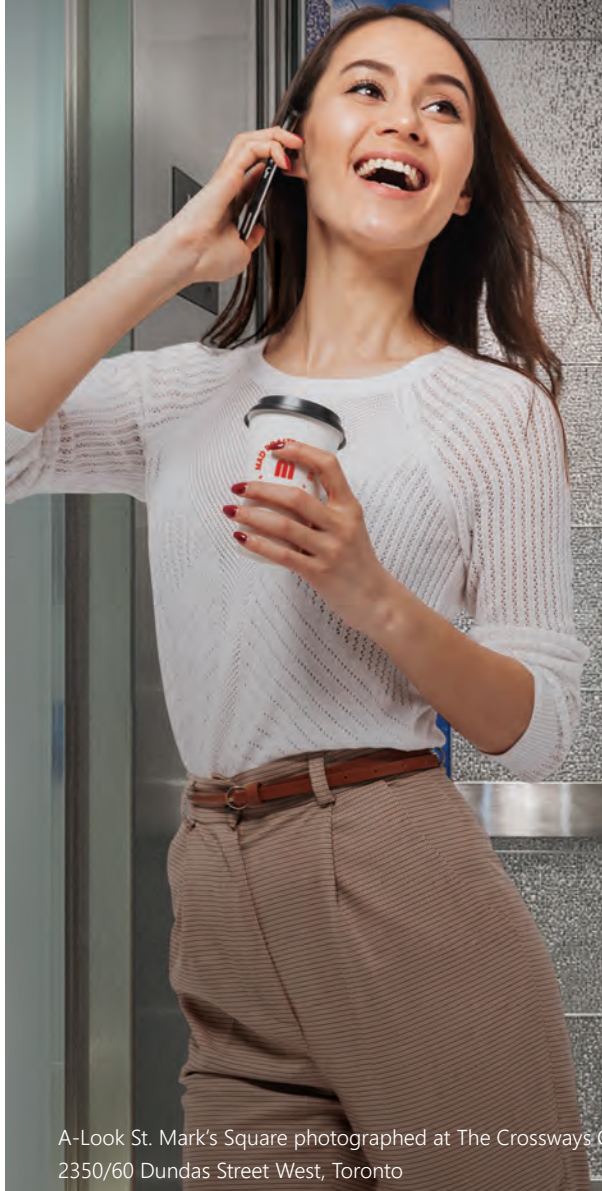
USB: Would you like to end our Q&A session with a personal statement?

OS: I love my job at Schindler in research. It’s exciting to observe new production processes, think about what we can do with them, try them out and, perhaps, change the future of the industry substantially as a result.



Undine Stricker-Berghoff is the owner of ProEconomy, a Luebeck-Travemuende, Germany-based engineering office through which she works as a coach and consultant for management and marketing mainly in energy and building services. From 2008 until 2013, she was the managing director of VFA-Interlift e.V. in Hamburg, Germany. She studied mechanical engineering at Ruhr-University Bochum, Germany, and, immediately after graduation, worked as an energy consultant for ERPAG in Lugano, Switzerland, and Campione, Italy. Prior to joining VFA-Interlift, Stricker-Berghoff worked for VDI, the Association of German Engineers in Duesseldorf, Germany, as secretary for Building Services, and was in charge of the VDI-Standards department. She also served one term as director general for the Luebeck Chamber of Commerce and Industry. She has operated ProEconomy since 2005.

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1973

ELEVATOR WORLD celebrates its 20th year.

by Dr. Lee Gray, EW Correspondent

It is interesting to note that ELEVATOR WORLD founder William C. Sturgeon did not acknowledge or celebrate the fact that the magazine had entered its 20th year until the March 1973 issue.^[1] This acknowledgement included a general reminiscence about the founding of EW and a reaffirmation of the magazine's commitment to serving as the primary means of communication and information dissemination within the vertical-transportation (VT) industry: "Although the format, general content, columns, contributors and staff have changed considerably," the mission statement found in the "first issue still holds true – we exist to serve the companies and the people within the industry."^[1]

While Sturgeon's precise reason for delaying recognition of this anniversary until the year's third issue is unknown, a review of the contents of the January and February issues reveals that EW entered the new year with an expanded mission that reflected events from its immediate past. Thus, perhaps, Sturgeon made a strategic decision to wait until March to "pause" and celebrate so as to not lose editorial momentum.

The magazine's expanded mission was reflected in a series of new columns, new staff members and new contributors. The new columns included "Lighting Up the Shaftway," "Innovation," "Dateline Washington," "A Matter of Association," "Outlook from the Orient" and "Contact: The Science of Relating People and Products." "Lighting Up the Shaftway," which first appeared in February 1969, was directly linked to a new VT industry initiative, which Sturgeon described in his introduction to the first column:

"During a meeting of Subscription Members at the annual meeting of the National Association of Elevator Contractors, Don Wiseman, Elevator Safety Division Chief of Michigan's Department of Labor, stated that a number of the governmental elevator inspectors throughout the United States and Canada had expressed enthusiasm over a projected formation of a national association ... Time did not permit an in-depth investigation of the exact nature such a group might assume but out of the discussions came an 'ad hoc' committee composed of Don Wiseman, John Miller, and myself which accepted the responsibility of further exploration ... Your editor stated that Elevator World would be happy to act, initially, at least, as a communications media for those within the inspector-consultant group and establish a column within which these categories could interact."^[2]

This proposed initiative – the creation of a new VT industry association – echoed the effort that resulted in the establishment of the National Association of Elevator

Contractors (NAEC) in the year prior to EW's launch in 1953. Once again, Sturgeon and his magazine were providing leadership and resources needed to address an emerging critical need.

The fruits of these efforts were revealed in the July 1971 "Lighting Up the Shaftway" column, which announced the creation of the National Association of Elevator Safety Authorities (NAESA):

"The purpose of this association will be to promote, foster, and assist in the promulgation of a standard elevator safety code and to exchange and impart information of common interest ... The membership of the association is to be comprised of federal, state, and municipal officials whose primary responsibility and function is the application and enforcement of elevator safety codes."^[3]

NAESA's first annual meeting took place later that year, and the January 1973 issue included a feature article on the organization's second annual meeting, held in November 1972. The meeting, described as a "National Workshop," focused on "the problems of the code developers and of the elevator companies that have to work with the codes."^[4] Featured speakers included William C. Cramer (chair of the A17.1 Executive Committee), Mark L. Mount (National Elevator Industry, Inc. (NEII) code engineer) and John J. Klocke (chief, Materials Handling Division, OSHA).

The "new" feature titled "Innovation," which focused primarily on new products, was, in fact an "older" feature that had previously been labeled "New Equipment." In November 1969, the new title appeared; this rebranding was intended to better reflect the industry's overall inventive and entrepreneurial spirit. A different kind of spirit was found in "Dateline Washington," which debuted in August 1970. The column was a monthly summary of governmental debates, decisions and decrees. Its author, Peter S. Nagan, had served as Washington correspondent for *Business Week* and had edited the "Report on Business Outlook" for the Bureau of National Affairs prior to joining EW. John Hicks, author of "A Matter of Association," also brought a wealth of experience to his column; however, in this instance, it was directly related to the VT industry. When the column first appeared in July 1971, Hicks was serving as the executive director of NEII. He had joined NEII's predecessor, the National Elevator Manufacturing Industry, Inc. (NEMI), in 1964. In 1967, he was named executive director and oversaw the transformation of NEMI into NEII in 1969. His column focused on a broad range of NEII initiatives and related news.

Continued



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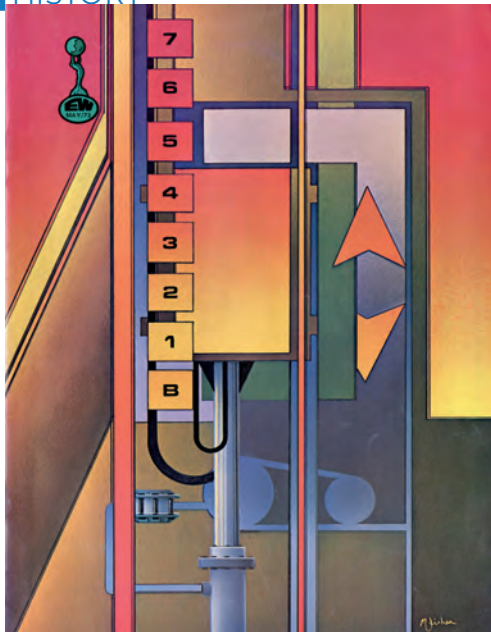


Figure 1: May 1973 EW cover art, "The World of Hydraulic Elevators," by Mike Fisher

The July 1971 issue also included the first in a new series that addressed the VT industry in Asia: "Outlook from the Orient." The column's primary author was Ken'ichi Kawashima, a consulting engineer and 35-year veteran of the Japanese VT industry. He contributed four columns

in 1973, one of which featured material contributed by Toshio Fukuda. Kawashima was, in fact, one of six EW foreign correspondents. The others were David M. Fazakerley (U.K. correspondent), Umberto Sermedese (Italian correspondent), Johannes Kleemann (German correspondent), Ehlver Hallberg (Scandinavian correspondent) and John Inglis (Australian correspondent). Many of these names are doubtless familiar to long-time readers and VT industry members, and their presence reflected EW's increasing coverage of international industry events.

The origin of the last new column, "Contact: The Science of Relating People and Products" (which first appeared in March 1973), was the subject of Sturgeon's opening editorial for the year.^[5] In 1969, he had created the "Contact Department," a new division designed to handle requests for reprints of past articles and issues. Sturgeon noted that the impetus for the new enterprise dated back to 1963 when the magazine "began receiving requests from contractors for reprints of 'In Search of the Past' to be personalized for distribution to their clients."^[5]

In addition to providing reprints, the new department also produced dedicated event-related publications, which included NAEC's "Key to Elevator Planning" and "the association's first income producing convention program."^[5] The Contact Department also provided copies of EW that featured customized company labels affixed to magazine covers for distribution to clients. In 1972, the product line was expanded to include reprints of elevator-related artwork; among the most popular were original works created by illustrators Mike Fisher and Jim Lee (Figure 1). The Contact Department was led by EW Editor and Publisher Ricia Sturgeon-Hendrick, who, in 1973, served the magazine as an associate editor. The "Contact" column focused on "best practices" in business and communication.

In his June editorial, Sturgeon, as a prelude to announcing the topic of the 1973 Annual Study, summarized the history of these unique issues:



Figure 2: "The World of Elevator Safety" planning conference. From left to right: Barry Sims (Haughton), Don G. Offerman (Westinghouse), Ricia Sturgeon-Hendrick (associate editor), William C. Sturgeon (editor), Jim Finley (Dover), Jack Fraser (Southeastern), William G. Niederauer (Otis), Randy Miller (U.S. Elevator), and Tim Duin (Montgomery)

"During the past eleven years of its twenty-year existence, Elevator World has published an Annual Study. In 1963, it was 'In Search of the Past,' the first history of vertical transportation; the following year 'People in Motion' analyzed mass-people-moving equipment. In 1965 and 1966, we edited Parts I and II of 'Packages in the Sky,' the most detailed study to date of 'industrialized building' and the 'rationalized elevator industry' in Europe and, in 1967, we published the first comprehensive study of the aerial ropeway industry written in any language, 'Men and Machines Against the Mountain.' The following year, the late Paul Kern's 'Rail Clips and Call Backs' compilation was well received by our industry's field men. In 1969, we assembled a study on 'Towers,' in 1971, 'Japan and its Elevator Industry' and, last year, 'Earthquakes and Elevators.'"^[6]

Sturgeon had intended to focus the 1973 Annual Study on "horizontalators," people movers developed for transporting passengers in large airport terminals. His plans, however, were changed at the April NAEC directors meeting, where he was asked to pursue "the subject of 'OSHA' and 'Safety Programming.'"^[6]

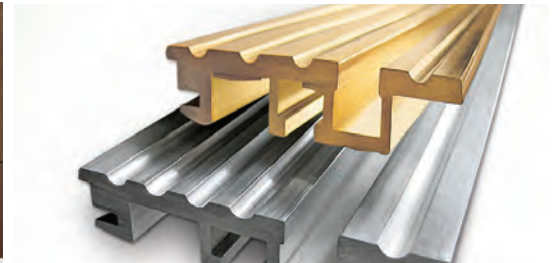
With this new goal in mind, Sturgeon reported that he and his staff were "involved with the safety engineers of a half dozen of the larger manufacturers in developing an Annual Study on The World of Elevator Safety."^[6] This effort included a two-day conference held at EW's headquarters in Mobile, Alabama, which was attended by representatives from eight leading VT firms (Figure 2).

As work on the Annual Study progressed, the project expanded to include a parallel document: a new *Field Employees' Safety Handbook*, which was designed to be easily carried by technicians and mechanics (the 84-page guide measured only 3.5 by 5.5 in.). Its table of contents touched on a broad range of topics: Safety responsibilities of the mechanic in charge, General safety requirements, Safe wearing apparel and personal protective devices, Precautions when working around electrical equipment, Hoists and slings, Scaffolds, Barricades, Portable ladders, Portable electric tools, Mechanic's hand tools, Welding and cutting, Safety when elevator is operative and Escalator safety rules. The text was accompanied by 26 tables, illustrations and charts. The handbook concluded with a section that addressed the following topics: Safety program,

Continued

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Figure 3: Mitsubishi Electric Company Ltd. double-deck elevators as seen in their factory

Safety coordination, Safety inspections, How people get hurt, Safety coordinators check list, Toolbox meetings 1 thru 24, First aid hints and Hoists signals.

The VT industry’s appreciation of the Annual Study (which appeared in October), and particularly the *Field Employees’ Safety Handbook*, was immediately evident in letters to the editor. The December issue included six letters expressing thanks for and congratulations on the handbook’s publication. In addition, and perhaps the most tangible “proof” of its success, were the handbook orders found in these letters, which exceeded 2,000 copies. The letters also included a communication from Toshio Fukuda in Japan:

“We were very impressed with the contents of the Field Employees’ Safety Handbook. The Japanese Elevator Association published something similar earlier this year, but it was only 13 pages and lacking informative illustrations. We now plan to publish an auxiliary handbook and wish to know if we might use some of the information within yours?”^[7]

The proposed transfer of EW-generated materials to countries outside the U.S. was, in fact, a theme found throughout the year. One such request was made by Horacio Goncalves de Moraes of Elevadores Sur S.A., located in Porto Alegre, Brazil. Moraes sought permission (which was granted) to translate the 1963 “In Search of the Past” Annual Study into Portuguese.

The topic of safety was, not surprisingly, a consistent subject explored in articles, columns and other features – including letters to the editor. One safety-related letter, and the published response, serves as a reminder of critical differences between the early 1970s and today. The May issue included a letter from



Figure 4: Otis Liften golf cart

Once again, Sturgeon and his magazine were providing leadership and resources needed to address an emerging critical need.

William F. Gallagher, the director of the American Foundation for the Blind:

“Elevators are a problem for the blind, particularly the elderly, and we receive many letters from architects asking what should be included in the building so that the visually handicapped do not become dependent on using sight guides for mobility. We have not seen any standards or guidelines for elevator push buttons. It seems as though we all have our own differing ideas about the type of devices and that there should be a conference of experts in the field of blindness, architects, elevator manufacturers, etc., who could develop the appropriate standards.”^[8]

The response to Gallagher’s letter was written by Mount. He stated that only two states, Michigan and Ohio, required “that elevators for the handicapped include braille numerals for the floors located on the car and hall push button stations covers. In addition, an audible signal is required to indicate the floor at which the car has stopped.”^[9] Mount went on to add:

“The A17 Elevator Code Committee does not have specific input from groups representing the handicapped, but it does receive suggestions from individuals. I am sure active representation on the A17 Committee would be welcomed. This can be accomplished by writing to the American Society of Mechanical Engineers, Codes and Standards ... expressing the desire to have a representative on the committee ... Our industry certainly wants to do all it can for the handicapped and if we do not have the proper guidance our efforts will fall short.”^[9]

The Michigan and Ohio standards appear to imply that the requirements applied only to “elevators for the handicapped,” thus not all elevators would have included these features. Mount’s response also indicates that code writers had not yet fully engaged issues associated with ensuring accessibility to VT systems. An important point of context is the fact that the

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Figure 5: EW logos: right (new version, used January - June 1973); left (original version)

Americans with Disabilities Act would not be introduced in Congress until 1988 and would not be signed into law until July 26, 1990. EW and the VT industry’s recognition of these issues speaks to their awareness of the importance of responding to the needs of all users.

As was the case with prior years, EW addressed a diverse range of topics that included serious issues such as VT accessibility, as well as celebratory events. In fact, EW was not alone in celebrating an anniversary in 1973; they were joined by the Inclinator Company (50th anniversary), F.S. Payne Company (70th anniversary) and the Sedgwick Machine Works (80th anniversary).

The year also saw a number of “firsts.” These included the first double-deck elevators installed in Japan.^[10] The Osaka-Obayashi Building featured eight double-deck machines built by Mitsubishi Electric Company Ltd. (Figure 3). Another, decidedly not vertical first, was reported by Erik Warners, director of Otis Liften in the Netherlands. He provided a photograph of the first golf cart employed at a Dutch golf course. The cart “was provided by one of the Otis subsidiaries in the United States” and featured the Otis Liften logo (Figure 4). A final EW first may, or may not, have been readily observed by the magazine’s readers. The cover of the January issue featured a new version of the magazine’s logo, which depicts Atlas lifting up the world. The new logo also incorporated a stylized version of the magazine’s initials (EW) in place of the full name on the cover. While the new logo clearly reflected the aesthetics of the early 1970s, its use lasted only six months: The July issue featured the return of the old logo (Figure 5). There is a lot, apparently, to be said for continuity.

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 [2] William C. Sturgeon, Introduction to “Lighting Up the Shaftway” (February 1969).
 [3] “Lighting Up the Shaftway” (July 1971).
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 [7] Toshio Fukuda (Toshiba Fuchu Works), “Comments” (December 1973).
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Clean and Safe

Gianni Cotteta (GC), president of Ad Rail USA™, tells your author (KF) how the company's Safe2Touch GBAC STAR™ Registered program is benefiting facilities and passengers.

by Kathleen Farrell

photos by Ad Rail USA

When Ad Rail USA President Gianni Cotteta last spoke with ELEVATOR WORLD in July 2020, the COVID-19 pandemic was disrupting business as usual for the company. During lockdown, Ad Rail USA envisioned a future that was less reliant on media buying for international tradeshow and, instead, capitalized on the unique features of Ad Rail™ Escalator Handrail Media, for which the company is the exclusive U.S. provider. Cotteta was hopeful that, as a vaccine was developed and economies recovered, companies would emerge stronger than ever.

Ad Rail USA put its dreams into action: The company recently underwent the Global Biorisk Advisory Council™'s (GBAC) STAR registration process for its Safe2Touch program, the purpose of which is to improve public safety on escalators. To receive this credential from GBAC, an application must include a list of claims and problem statements, providing evidence that the offering will effectively support a hygienic indoor environment with a demonstrated advantage over existing offerings. Your author caught up with Cotteta to learn more about this award and the current state of the company.



Ad Rail offers custom QR codes to help brands boost the functionality of their campaigns.

KF: Please tell us how the COVID-19 pandemic affected Ad Rail USA's business model and focus.

GC: The pandemic turned our product, Ad Rail Escalator Handrail Media, from a want to a need. Public facilities quickly recognized that, due to the risk of germ transfer, riders were more reluctant to hold on to handrails than before, increasing risk of injury and liability. Safe2Touch by Ad Rail provides a solution for both problems: Our exclusive film is antimicrobial and the graphics help passengers gauge speed and motion, so they can take a more natural step on and off. "Clean and safe" became the lead focus while media buying recovered.

KF: How did the effort to achieve the GBAC STAR Registered seal for the Safe2Touch program come about?

GC: Ad Rail USA CEO and Partner Robert Lovell brought this opportunity to the company's attention as a must-have, timely business pivot. The Safe2Touch GBAC STAR Registered program can regulate standard operating procedures (SOPs) and duplicate those processes across a growing GBAC STAR Registered Network. We understood that this process would be critical to not only solidifying our credentials but also substantiating the fact that Ad Rail USA has solved the 120-year-old problem of rider safety and germ prevention on escalators. This endorsement has given our facility partners and customers a credible solution to invest in long term.

KF: Could you tell us more about GBAC's extensive scientific and legal review?

GC: The GBAC Advisory Council Scientific Board assessed Ad Rail USA's Safe2Touch program by an extensive pass/fail process. Safety and compliance with applicable standards and guidelines were met. Usability, implementation and training methods were also validated, along with a review of marketing language and claims to represent the scientific and legal accuracy of our program. GBAC reviewed our entire 20-year product history and every credential, including several years of prior safety studies, methodologies and material specs. They thoroughly examined our SOPs from initial preparation for our exclusive film application installation to post-application cleaning protocol.

KF: How long did the accreditation process take from start to finish?

GC: The GBAC review process took a year and taught us patience and commitment.

KF: What did the Ad Rail USA team teach GBAC about proper escalator cleaning and maintenance?

GC: The GBAC team quickly discovered that we spent several years working with the largest agencies in the world to



Handrail media displays marketing messages, event sponsors, social media handles and more.

evaluate our product to ensure it was, in fact, increasing escalator safety. We have worked with the national ASME code committee, Synovate Research, Liftinstituut, major escalator OEMs and local and state governments to support our claims. Through this process, GBAC also learned that we have a proprietary cleaning and maintenance process that cleans and conditions the handrails. Additionally, the film provides a germ barrier that encapsulates escalator handrails, producing a non-porous surface to clean and disinfect.

KF: Safe2Touch addresses germ prevention on the third-dirtiest surface in a public facility: escalator handrails. Out of curiosity, what are the two public surfaces with the most germs?

GC: The top two above escalator handrails are gas pumps and mailbox handles, according to a study by Kimberly-Clark.

KF: Ad Rail USA handrail media has an impressive 85% brand recall rate. How have venues and brands used your antimicrobial film application to promote public safety messages throughout the pandemic?

GC: This type of brand recall is difficult to achieve in the advertising industry. We've been able to accomplish this mainly because the product is so unexpected, unique and clean. It is literally in the hands of the escalator passenger for 30-60 s each ride, which is considered remarkable "dwell time." Since the pandemic, we have created the perfect long-term solution for both facilities and brands. Facilities want three-to-five-year Ad Rail Safe2Touch programs with training for their maintenance staff to ensure they stay GBAC STAR Facility-compliant through continued investment in improved methods for their buildings. Brands have a multi-year sponsorship opportunity, much like naming rights, to financially support the program. They are also able to tout their commitment to social responsibility by keeping their public facilities, attendees, passengers or loyal sports fans clean and safe. For example, Walter E. Washington Convention Center used Safe2Touch to show off their impressive certifications, logo and a QR code link to their website, plus a strong "please hold handrail" call-to-action.

KF: During the first year of the pandemic, you saw decreased tradeshow business and increased interest in your antimicrobial handrail coating. Has the demand for germ-barrier film remained strong?

GC: The pandemic completely shut us down like the rest of the world, but only for a short period until our customers

“ We understood that this process would be critical to not only solidifying our credentials but also substantiating the fact that Ad Rail USA has solved the 120-year-old problem of rider safety and germ prevention on escalators. ”

— Ad Rail USA President Gianni Cotteta

shifted focus to the safety aspect of our product. They realized that we weren't simply a media company; we had a solution to a widespread problem. With the additional offering of our Safe2Touch program, the demand for germ prevention post-pandemic is rapidly expanding.

KF: When we spoke to you in July 2020, Ad Rail USA was anticipating an increase in business based on demand for your antimicrobial escalator handrail media. How has business grown over the past several years?

GC: Achieving our new GBAC STAR Registered Safe2Touch program seal has opened a new channel of opportunities as facilities and events are now back in full operation. We have a very high client retention rate with brands like Amazon, Raytheon, IBM and others. We are now seeing demand from multiple channels, including airports, arenas, stadiums and convention centers. While germ prevention is essential to our facility partners and the public, the additional proven benefit of reducing trip and fall liabilities has been a requested priority.

KF: At that time, Ad Rail USA had more than 3,500 installations worldwide. What is that number currently?

GC: There have been more than 5,000 installations worldwide to date, and our product has been experienced by more than 1 billion people. 🌐



Texas Strong

With safety as a constant guide, RICO Elevators grows and meets challenges with a focus on heavy industry.

by Kaija Wilkinson

Receiving the Award of Safety Excellence 2022 from Texas Mutual Insurance Co. came as no surprise to RICO Elevators, Inc. (ELEVATOR WORLD, February 2022), headquartered in Dickinson, Texas, approximately 30 mi. southeast of Houston. That's because ever since Mark and Lana Fehrle founded RICO – an acronym for its four main business areas, Residential,

Industrial, Commercial and Offshore – in Houston just over 20 years ago, safety has been a cornerstone of the company. “With RICO, safety is everything,” RICO Vice President (VP) Nick Austin says. “What I have learned in my experience is that the key to a successful business is keeping your employees safe, healthy and well-trained.” Once those things are accomplished, he observes, “growth and profits follow.”



Rack-and-pinion stack elevator at a power generation plant

RICO President Mark Fehrle and Chief Financial Officer Lana Fehrle launched RICO after Mark's nearly 24-year career as a service technician and 12 years with rack-and-pinion industrial hoist specialist Alimak Hek in the Houston area. He wanted to run a company that prioritized service and response times. The Fehrles started bidding on (and winning) jobs as they became available throughout Texas. Power plants and port authorities made up the initial customer base, but it has since expanded to include homeowners, office property owners and operators of oil rigs, ships and barges. RICO provides elevator repair, modernization and preventive maintenance to these entities, and expanded its residential customer base with a partnership with Fox Valley Elevator™ a few years ago.

After its founding, RICO quickly outgrew its 2,000-ft² space in Houston, relocating to the current 6,500-ft² building in Dickinson within two years. In 2011, the company opened an additional office in central Texas to both grow its customer base and enhance its ability to provide timely service to existing customers. The lion's share of RICO's customers is within its industrial division that includes power plants, bridges, dams, refineries, chemical plants, mines, ports, research facilities and other

private industrial entities. Between the two offices, the company employs 10 service technicians and seven office personnel.

As RICO continues to grow and add customers, the need for additional employees persists, and recruiting manpower remains its biggest challenge. “Of course, the high cost of insurance cannot be disregarded, but our safety record has helped tremendously in managing these costs and keeping those premiums within reason,” Mark Fehrle says. To help ensure RICO’s culture of safety remains strong, the company prefers to hire and train new technicians “from scratch,” Mark Fehrle says. He is also big on communication and organization.

Office Manager Brandon Toole says RICO goes above and beyond in terms of safety, stating:

“No. 1 is communication, and that’s for personnel across the board. We have Monday morning meetings in which a supervisor leads a discussion about a specific safety topic. But, more importantly, there is always an open discussion among all parties at the meeting about anything that was seen or encountered in the previous week or even a facility-specific risk and how it can be mitigated.”

“We work in facilities with sometimes hundreds of different contractors working at the same time. We have taken procedures from these facilities and applied them across the board at all work locations. Tasks such as work permits, entry logs and job safety analysis reports are a common element to any RICO worksite.”

Another key to safety, Toole says, is Mark Fehrle’s “open door” policy. Every employee has his personal cell phone number. Mark Fehrle also believes in never asking another

employee to do something he would not do himself. This could be, for example, asking a single employee to perform work that would be safer and more efficient if performed by two. “It also comes down to accountability,” Toole says, continuing:

“Every person in the company holds each other accountable for their actions. This is something that was taken out of the [Mine Safety and Health Administration] playbook. Safety starts and stops with you. [Nick Austin] says that, as VP, knowing that

ownership cares more about the safety of their employees than the profit of the company changes the outlook of every employee that comes to work for RICO Elevators.”

A key member of the RICO team, Austin joined the company 17 years ago after spending more than five years working for an elevator OEM on elevators in South Africa, the Middle East and all over North America. He has been involved in manufacturing, testing and erecting elevators all over the globe. Austin says:

“I had the opportunity to work for an elevator manufacturer that specialized in building unique elevator systems for mostly harsh environments. In doing this, I was able to lead a team overseas for several months at a time for several different projects. Over the years, I had a chance to see and work on specialized equipment that mostly had never been installed

before in those particular environments. This forced me to think outside the box, and also to be ever-reminded of the many different factors that keep myself and those around me safe.”

Weathering the Pandemic

Thanks in part to its large industrial client base, the COVID-19 pandemic had little negative effect on business. Like everyone else, RICO had to deal with supply chain issues that

Continued



Rack-and-pinion elevator on a hydroelectric dam

delayed delivery of parts and equipment. This situation, Mark Fehrle says, is starting to improve. Ironically, the company feels grateful for pandemic-related social distancing forcing it to come up with more innovative ways to communicate with employees and customers. New, paperless initiatives and systems have helped RICO enjoy “extraordinary growth in the post-COVID world we now inhabit.”



Container crane personnel elevator

“New, paperless initiatives and systems have helped RICO enjoy extraordinary growth in the post-COVID world we now inhabit.”

The company communicates with its customers much more efficiently thanks to a new online portal. “Pairing this innovative technology with the use of vehicle GPS units has allowed RICO to be as efficient as possible in scheduling, even re-routing our technicians when customers have emergency elevator needs,” RICO Service Manager Dustin Via says. Customers can now see any service that is performed on-site, and RICO is working to allow customers to see parts that have been replaced, as well as other analytical data such as when safety tests are scheduled or due to be performed.



Mark and Lana Fehrle

Family and Local Community

A family atmosphere is pervasive at RICO. “Celebrating employees’ birthdays, hosting annual employee crawfish boils and putting on an annual RICO Christmas party are just a few of the ways the management team enjoys providing for its employees,” Toole says. RICO also gives back to the local community. It donates annually to the Dickinson High School football calendar fundraiser, purchases cases of Girl Scout cookies, donates essential education supplies to local school districts and has contributed to Shriners Hospitals for Children for 18 years running. The company has sent local athletes to sports camps and invested in entities including area sheriffs departments, the Texas Parks and Wildlife Department, rehabilitation services and military veteran help programs. It has even provided training to local fire departments free of charge to better prepare them for elevator emergencies. Its most recent effort is to support the Great Blue Heron Statues project, created to educate young people about the local environment and the preservation of Dickinson Bayou.

What’s Next: Supertalls and Orbital Platforms?

So, what’s next for RICO Elevators? Other than continued growth, Mark Fehrle is developing a new type of traction elevator drive system. It is a machine-room-less system that can overcome the limited rise currently available with other traction drive machines and can reach heights of well over 2,500 ft. “This would allow the Burj Khalifa and other supertall buildings to have express elevators from the ground level to penthouses on the top floors without the need to change elevators,” Mark Fehrle says. The system can also be used in low- or zero-gravity applications, allowing multilevel transportation on future space stations such as Gateway Spaceport – an effort first formed in 2012 to build the first rotating spaceport and space hotel.^[1] “This station will need a transportation system to move personnel and freight from the docking station to the inner and outer rings,” Fehrle says. “RICO is working on a solution.”

Reference

[1] en.wikipedia.org/wiki/Gateway_Spaceport



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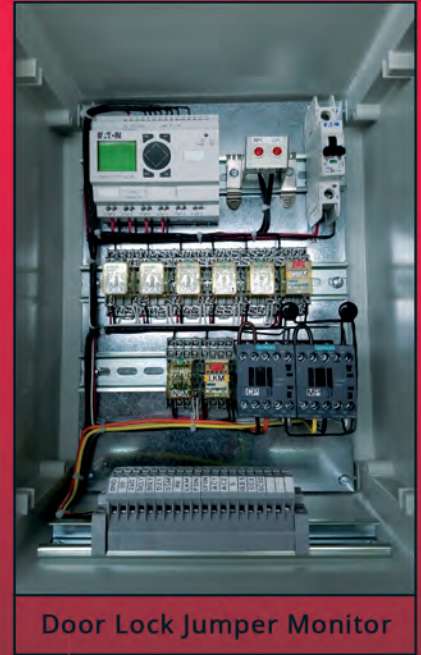
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Safety Is No Accident

How NEII and its members are working together to improve worker safety and keep elevators and escalators the safest mode of transportation for the riding public.

by Trent Behr

Vertical transportation (VT) is the most used form of public transportation, as passengers make more than 280 billion trips on elevators and escalators every year in the U.S. More importantly, it is the safest. A track record like that does not happen by accident; it requires intention and hard work. The VT industry is laser focused on the safety of its personnel and the riding public. Over the years, exceptional service, a well-trained workforce, innovative and reliable equipment and robust safety construction codes have allowed passengers to take for granted that their elevator and escalator rides will blend into the background of their daily lives.

National Elevator Industry, Inc. (NEII) and its member companies are committed to continually improving worker safety by addressing new innovations and ensuring safe operational parameters in the American Society of Mechanical Engineers (ASME) codes, developing safer products, sharing comprehensive safety tips and enhancing workplace best practices. NEII is also taking a leadership position to ensure all workers have proper personal protection equipment (PPE) and to reduce incidents related to elevator hoistways on construction sites. As a member of the U.S. Department of Labor's Occupational Safety and Health Administration Elevator Industry Partnership (OSHA Alliance), NEII continues to develop industry training materials and best practice guidelines. These ambitious efforts are forged by the universal industry commitment to safety and our continuous commitment to a world in which even one injury or fatality is one too many.

Setting the Standard

NEII worked with industry stakeholders, including the International Union of Elevator Constructors (IUEC), to develop three proposals for the 2022 edition of the ASME A17.1/CSA B44 code. These changes focused on key areas related to employee safety. Two changes were focused on pit ladders, with one eliminating an exception that allowed narrower ladders by ensuring alternate options for holding on to the ladder when space is limited, and the other adding sensors on pit ladders to prevent the elevator from running if someone on the pit ladder failed to activate the pit stop switch. The third change added lighting throughout the hoistway to increase situational awareness when accessing the hoistway and provide lighting while working in the hoistway on top of the car. While these improvements are a step forward, the work is not done, as several proposals are currently being considered for future editions of the standard.

Rising to the Challenge(s)

Ensuring all employees in the field have the safety equipment they need is a fundamental requirement to maintaining a safe workplace. Acting on feedback from women in the field, last year NEII issued a PPE challenge to the entire VT industry (ELEVATOR WORLD, January 2023). A joint effort from NEII's Diversity, Equity and Inclusion Working Group and Safety Committee, the campaign promoted the urgent need for companies not already doing so to provide PPE that will comfortably fit every employee. Offerings should include gender-inclusive uniforms and safety harnesses, as well as a wider range of sizes for gloves and hard hats. This year, NEII plans to expand its PPE challenge to all building trades.

To increase public awareness, NEII issued its second annual Elevator and Escalator Safety Challenge – a contest held online in honor of Elevator and Escalator Safety Week. This is an important opportunity to reach out and educate the riding public about some basic safety features of VT equipment. During the 2022 event, more than 330 participants completed the safety quiz and learned more about equipment safety features like door interlocks and how elevators are tested to manage their posted weight limits.

Standing Up for Hoistway Safety

The mantra “one injury is one too many” permeates the NEII Safety Committee. As such, NEII has been working on a Hoistway Safety Initiative, which will educate other trades about the dangers of working in and around hoistways on construction sites and mitigate the risks through awareness and safety tips. Through the analysis of historical data, NEII identified that nearly 70% of hoistway incidents that happen in construction involve non-elevator industry personnel.

This educational and awareness campaign is necessary for all trades on a construction site and will be applicable to both field personnel and those visiting a jobsite. Before elevator constructors begin installing the equipment, hoistways are often used as a trash chute, so it can be a reflex for workers to continue to toss items down the shaft even after installation begins. And if the hoistways are not protected with highly visible and sturdy materials, workers and visitors could fall through a hoistway opening with one misstep.

To mitigate this risk, the NEII Safety Committee identified three barriers that can be incorporated into the management of construction sites, one of which is already used consistently per OSHA regulations. The suggested best practices will not only



Netting



Door



Lobby

prevent items from being dropped into the hoistway but will also protect individuals working or walking near a hoistway when they might trip or slip. There is no “one size fits all,” so three options allow the application of the most appropriate barrier for each job.

Netting: heavy-duty mesh barrier affixed to the hoistway door frame and hung across the opening along with wooden railings and toe guards

Door: solid wooden “box” (which can be flat or several inches deep) attached to each hoistway opening with a door and lock

Lobby: solid barriers with locked doors at each end of an area with several elevators

This year, NEII will launch an in-depth hoistway safety awareness campaign, one of multiple important safety initiatives. A large part of the effort will be the development of materials that can be shared with industry stakeholders, including graphics, signage, best practices and more. NEII will be working with our industry stakeholders, as well as other building trades, to increase understanding about hoistway risks, improve behavior and reduce opportunities for incidents and injuries.

Handbook of Safety

The *Elevator Industry Field Employees’ Safety Handbook*, which is available to purchase from ELEVATOR WORLD’s bookstore, elevatorbooks.com, is updated every five years. The *Handbook* is the industry standard for elevator and escalator personnel safety. NEII’s Safety Committee works in collaboration with industry partners on each new edition to ensure it includes the latest technology and safety procedures. The next round of updates will begin this summer, with the next edition of the *Handbook* scheduled for release in 2025.

OSHA Alliance

In 2021, the OSHA Alliance was renewed by all its industry partners, including the Elevator Contractors of

America (ECA), Elevator Industry Work Preservation Fund (EIWPF), National Association of Elevator Contractors (NAEC), National Elevator Industry Educational Program (NEIEP), IUEC and NEII. Work continues to develop best practices, training materials, communications and educational tools for the industry and the construction trade to ensure that industry personnel and the riding public all get home safely at the end of the day.

Absolute Safety

In 2019, NEII’s Safety Committee, in partnership with NEIEP and NAEC, developed the “9 Safety Absolutes” as a best practice guide to maximize safety and prevent injuries on the jobsite. NEII also has additional resources for industry personnel and the general public on its website. To learn more about elevator and escalator safety, go to nationalelevatorindustry.org/safety.

But beyond those important worker and rider safety tips, there is one absolute that everyone must embrace: Safety does not fall to one person, committee or organization — safety is everyone’s responsibility.



Trent Behr serves as the director of safety for NEII. Prior to joining NEII, Behr served as a project manager for Global Power Technologies — Google. In this role, he oversaw all aspects of the electrical power

management system team, including environmental health and safety. Behr has also worked for Pottawatomie County, as well as Union Pacific Railroad, where his responsibilities included code enforcement and OSHA compliance, respectively. He graduated from the University of Nebraska at Omaha (UNO) with a Bachelor of Science in political science and a Bachelor of Arts in psychology. Behr is continuing his education at UNO through a master’s degree in public administration.

WOW

TKE provides innovation and accessibility for historic building-turned-shopping center.

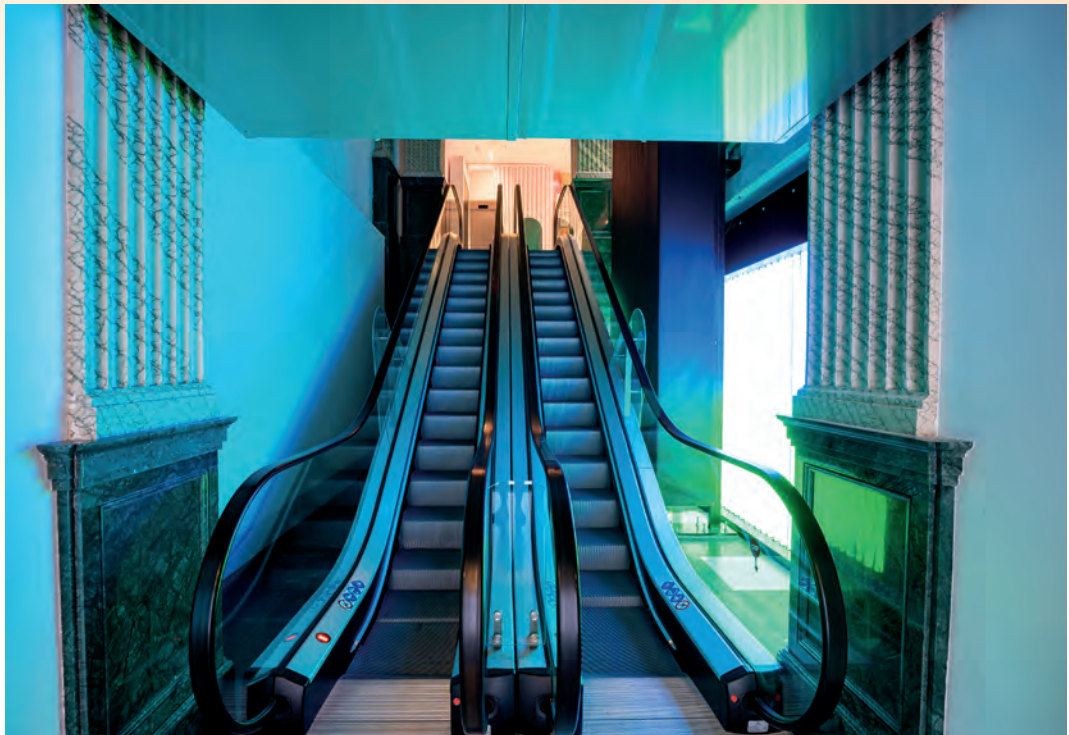
*by Olga Quintanilla Marful, EW Correspondent
photos courtesy of TKE*

The Gran Via in Madrid is gradually recovering its pre-pandemic splendor, and it does so with an air of modernity. The remodeling of an emblematic building merged with the innovation and accessibility delivered by TK Elevator (TKE) to transform the old Hotel Roma into the unique WOW Concept Shopping Center.

The German firm installed a total of 15 elevators and escalators in what is considered one of the best shopping centers in Madrid. Located at 18 Gran Via, this heritage building, built in 1913, boasts an area of 5,500 m² distributed across eight floors.



TKE velino XTRA 3 EK 35° 800HOR escalators



Ten velino escalators were installed for the project.

More About WOW

According to Madrid's official tourism website,^[1] WOW is a mega store designed as a multi-brand and multi-product commercial center in the heart of the Gran Vía in Madrid. It offers a unique shopping experience at a digital and physical level. With 5,500 m² divided over eight floors, "WOW will have a temporary, rotating and, at times, exclusive range of fashion, decoration, technology, design and leisure, as well as technological leisure spaces, e-gaming, a cookery school, fitness and Instagramer studios, a digital museum and even a café where the waiter is a robot with an articulated arm," the site continues. Brands range from traditional to innovative and emerging, with some even rising from going viral on the internet and social media. Each floor is said to offer its own unique experience with brands dedicated to the floor's theme: "Tech Garage," "Self-Care Lab," "Home Boulevard" and so on. The top two floors are dedicated to gastronomy.

Prior to the renovation carried out by the Allende Arquitectos studio, the building housed the Justice Department of the Community of Madrid. With the extensive renovation, to which TKE contributed, the property has achieved LEED Gold certification, which implies the highest rating in terms of energy efficiency and sustainable design. The shopping complex, classified as futuristic, was inaugurated in March 2022 and offers visitors a sensory experience while shopping and enjoying the different restaurants and beauty services.

Of the 15 pieces of equipment installed, 10 are escalators of the velino XTRA 3 EK 35° 800HOR model, the installation of which was spectacular when carried out on the façade, as described by the TKE technicians. The step width is 600 mm, the height of the balustrade is 1,100 mm and they are prepared for MAX technology, the pioneering predictive maintenance system for elevators. This technological solution is powered by Microsoft Azure IoT technology, which significantly increases the availability and efficiency of the equipment.

"These accessibility solutions allow customers to enjoy their shopping experience and move safely and smoothly between the different spaces dedicated to fashion, beauty, decoration, as well as the two floors for restaurants," said TKE.

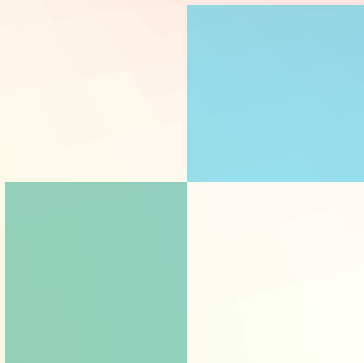
To guarantee accessibility to visitors of the shopping complex in terms of efficiency, TKE installed two passenger elevators, a freight elevator and two dumbwaiters in addition to the 10 escalators. The elevators belong to the Synergy range, models that satisfy the highest demands in comfort, flexibility and design. This equipment can support loads of up to 1000 kg with a speed of 1.75 m/s, has eight stops, double boarding at 180° and is also prepared for MAX technology.

The freight elevator is also from the Synergy range, with a capacity of 1000 kg, a speed of 1.75 m/s and six stops and also

Continued



Elevators from the TKE Synergy range



A total of 15 escalators and elevators were installed by TKE.



The escalator step width is 600 mm, and the height of the balustrade is 1100 mm.



The WOW Concept Shopping Center was inaugurated in March 2022.

technically prepared for MAX technology. The two dumbwaiters serve the restaurant area.

The inauguration of the building had to be postponed due to COVID-19, which also affected the development of the work. "The duration of the work has taken longer than expected due to COVID and the complexity of the work to be carried out for multiple reasons," a TKE official told ELEVATOR WORLD. The assembly began on April 5, 2021, with the freight elevator, and ended on March 28, 2022, with the delivery of the European Union Declaration of Conformity for the stairs, according to TKE.

Pedro Martín, general manager of TKE for Spain, Portugal and Africa, said:

"With this new facility, we reinforce our presence in relevant buildings in the city of Madrid. It is an innovative business concept to which we contributed with our extensive experience and excellent installation service. With our teams, the WOW Shopping Center has the best quality and assistance at their facilities."

"Participating in projects like this is exciting and helps us in our goal of continuing to grow to offer the best to our customers."

This shopping center is causing a great furor among customers and visitors since, as expressed by those responsible for WOW, it is an "extremely ambitious project because it wants to revolutionize the world of retail, which seems to be an innovative world, but deep down it is a very conservative world."

This unique complex exhibits a fresh and innovative design where the digital part has an important weight thanks to new technologies at the design, production and manufacturing levels. "Each floor of the building is planned to be a unique experience, which is related to the product that is sold. And, at the same time, it tells the visitor a different story." In short, the WOW Shopping Center is a new way of buying and experiencing different sensations.

References

[1] esmadrid.com/en/shopping/wow

CAN XL at Germany Tradeshow and Beyond

CiA association says evolving communication platform holds promise for the elevator industry.

by Kaija Wilkinson

The nonprofit CAN in Automation (CiA) association hosted a booth and Bosch, NXP and Vector presented running CAN XL (extra long) open-standard communication networks at the Embedded World tradeshow at NürnbergMesse in Nuremberg, Germany, on March 14-16. Control Area Network (CAN) technology is widely used in automotive and industrial automation applications and is the basis for communicating with CANopen and DeviceNet protocols.^[1] CiA Managing Director Holger Zeltwanger tells ELEVATOR WORLD CANopen Lift, the CAN communication platform for elevator control systems (EW, July 2018), is currently based on Classical CAN, the first generation of the CAN protocol. CAN XL is based on the third generation of the protocol and is still in the prototype phase, which means only engineering samples for protocol controllers and transceivers are available. “CAN XL is more than just a data link and physical layer improvement,” Zeltwanger said. “It is a complete ecosystem.” CAN XL provides embedded management functions that allow different higher-layer protocols to run simultaneously, thereby supporting virtual networking. Optional functions include CANsec (cybersecurity at line speed).

Mass production of CAN XL is expected by 2026. According to CiA, CAN XL, like any CAN technology, is applicable to the elevator industry, but will first be used by the automotive industry, which was the case with Classical CAN and the second generation, CAN FD (flexible database). Zeltwanger said:

“As you may know, the elevator industry is very conservative – not adopting new technologies as quickly as other consumer markets. Nevertheless, the elevator industry also looks to the future. CAN XL is an approach that fits future needs of lift makers. It provides frame length of 2024 byte (versus Classical CAN with 8 byte) and transmission speeds up to 8 Mbit/s for longer distances (versus Classical CAN with 250 kbit/s). Although this still needs to be evaluated, it would allow for more data for cloud services, diagnostic services, voice-over CAN applications, etc. Within the CANopen Lift Specification Working Group (WG), we will evaluate CAN XL at one of the next meetings. But we are not in a hurry, since the technology is just arriving.”

At the Nordic Lift Expo 2023 in January, Zeltwanger said he heard about U.S. elevator companies wanting to learn more about CANopen lift specifications. Organizing a seminar to educate the North American elevator industry about this open-standard communication specification, which “enables



CAN XL is an approach that fits future needs of lift makers.



— CiA MD Holger Zeltwanger

users to easily integrate devices from different manufacturers,” is a possibility. In Detroit in April, CiA organized two events aimed at American automakers: the CAN XL Plugfest and CAN XL TechDay. “This is also important for the elevator industry, since the adaptation in road vehicles increases the volume, in turn driving hardware prices down.”

Oskar Kaplun, an engineer at CiA, observed the elevator industry can benefit from CAN XL, but it is not yet clear how it would fit with existing solutions or if it will become a “must-have.” Currently, Kaplun said, the CiA Lift WG focuses strictly on CANopen based on Classical CAN, which it has done for the past 20 years. The WG sees no obvious benefit of switching to even CAN FD, he said, continuing:

“Efforts of the WG resulted in a standardized CANopen interface for lifts that’s been available on the market with constantly evolving features for 20 years. The WG will surely evaluate CAN XL [for lifts] once it becomes available on the market. On the other hand, companies that develop proprietary CAN-based protocols and do not bother with a standardized solution for lifts can start to integrate CAN XL anytime, once the microcontrollers with CAN XL controllers become available for industrial automation. That is expected in about four to five years. I imagine that CAN XL can be used in CANopen or a proprietary CAN-based lift protocol for predictive maintenance, big data collection from the embedded lift CAN network, firmware updates and, of course, to facilitate less time-consuming process communications and communication traffic control.”

Reference

[1] ccontrols.com/tech/can.htm

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Leadership Style Matters

What is yours?

by Vong Keovongsa

In my professional career, I have had the opportunity to work alongside very strong leaders. These leaders possessed a natural ability to accomplish tasks, while still maintaining a positive relationship with the people they were leading. I have also worked alongside very poor leaders, who should never have been placed in a position of leadership. These individuals placed a higher degree of priority on accomplishing tasks over concern for the people they were leading. With this type of leadership style, people are motivated to accomplish tasks out of fear, leading to high employee turnover and short-term performance results.

The ability to balance concern for people and tasks requires a high degree of disciplined leadership skill. This article will introduce five leadership styles that were developed by Robert R. Blake and Jane Srygley Mouton in the 1960s. Blake and Mouton worked together at the psychology department of the University of Texas at Austin during the 1950s and 1960s. They are known primarily for the development of the “Managerial Grid” as a framework for understanding managerial behavior. Today, the Blake and Mouton Managerial Grid continues to be utilized as a tool to develop leaders.

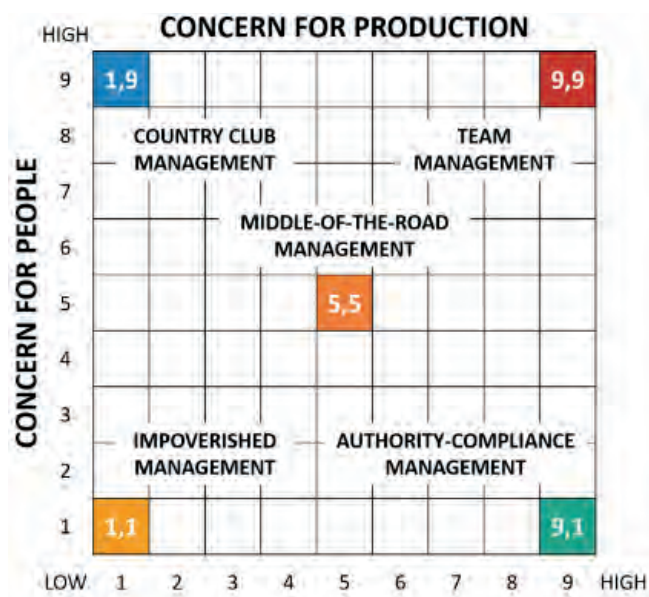


Figure 1: Blake and Mouton Managerial Grid

The key to understanding how the managerial grid can help leaders identify their natural leadership style is to plot where their scores are on the y-axis, the level of concern for people, and the x-axis, the concern for production. A quiz to determine

The ability to balance concern for people and tasks requires a high degree of disciplined leadership skill.

scores in each area can be found at academia.edu/30043210/Blake_and_Mouton_Leadership_Styles_Questionnaire or by emailing Vong@elevatorservicesgroup.com.

To help you improve your leadership skills, it is important to understand the differences among the five leadership profiles on the Blake and Mouton Managerial Grid.

- 1) **Imperished Management** results from a leader with a “chip on their shoulder,” the type of manager everyone warns people to avoid. This person is a disgruntled leader who will not hesitate to openly complain about what makes them unhappy at work. The work environment is filled with negative energy, and this manager only gets results by utilizing negative stimuli to achieve results. If you have an Imperished Manager in your organization, get rid of them FAST.
- 2) **Country Club Management** is when the leader is overly concerned about the team’s level of engagement, happiness and well-being, but there is very little focus on accomplishing tasks. While this type of leader creates a happy work environment, the business will ultimately suffer when the work is not done. The Country Club leader believes if people are happy, they will naturally accomplish tasks. This is not always true.
- 3) **Middle-of-the-Road Management** aims to achieve status quo results. There is not a high priority for accomplishing tasks or concern for people. The business results are average, without exceeding any expectations. Unless these types of leaders are pushed to achieve bigger results, they will keep the organization at the same level of performance indefinitely.
- 4) **Authority-Compliance Management** is all about “getting things done,” even if it means upsetting people to make it happen. There is no concern for people. This leadership style will drive people to leave the organization. Results will be short term, turnover will be “through the roof,” and business profits will suffer.
- 5) The **Team Management** quadrant on the managerial grid is the ideal leadership style, and the one style that strikes an equal balance of concern for tasks and people. These leaders achieve the best results. The desired business results are achieved, while also retaining and engaging people. This

leader is the most valued asset of the organization.

The Blake and Mouton Manager Grid is a very useful tool to help in developing a leadership style. If you find yourself in one of the less-than-desired quadrants, it is not too late to change. It is very possible to transition from the 1.1 Quadrant toward the 9.9 Quadrant on the leadership grid. To move toward this goal, I encourage you to take the managerial quiz, so you can develop self-awareness about your leadership style. Invest in additional leadership training resources to help hone and develop skillful leadership traits. Your leadership style matters. It matters to the people you lead. It matters to the business that hired you. It matters to the future of your personal success.



Vong Keovongsa runs Elevator Services Group, a company that offers safety, recruitment and HR support to VT companies, with Susie Madden.

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Getting Creative

Vantage supplies VT equipment for a royal redo at La Gorce Palace.

by Daniel Baltzegar

photos courtesy of Vantage Elevator Solutions

La Gorce Palace Condominium is situated right on the shore of the bright blue waters of the Atlantic in the Mid-Beach area of Miami Beach, Florida. The bright blue glass windows adorning this 34-story tower almost seem to mimic the color of the ocean, making La Gorce Palace a sight to behold.

Completed in 1996, the building's original vertical-transportation (VT) equipment was Dover TIV Trafromatic controllers with geared machines. In early 2020, La Gorce Palace began its search for consultants to provide scope and budgeting for the modernization of four traction elevators to begin in 2021.

Almost all the major equipment needed to be replaced, including controllers, machines, fixtures, door equipment and cab interiors. Due to the condominium's proximity to the water

and surrounding buildings, a crane was not permitted to hoist the equipment to the roof. Therefore, companies had to be creative during the bidding process. In the end, Suncoast Elevator was awarded the project due to its package solution, ability to work out the logistical challenges and positive reputation in the market.

Suncoast Elevator chose Vantage Elevator Solutions as its complete package supplier and engineering partner. Vantage provided four Hollister-Whitney GL260 gearless machines with 350 ft/min travel speed. EC Pixel AC controllers with Regen drives were also chosen for the project.

Because using a crane was not possible, special rigging had to be designed and built on the rooftop by Thomas Weeks, founder and president of TW Elevator Solutions. Utilizing

Continued



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Special rigging was vital to the project's success.



Suncoast replaced all components in the machine room.



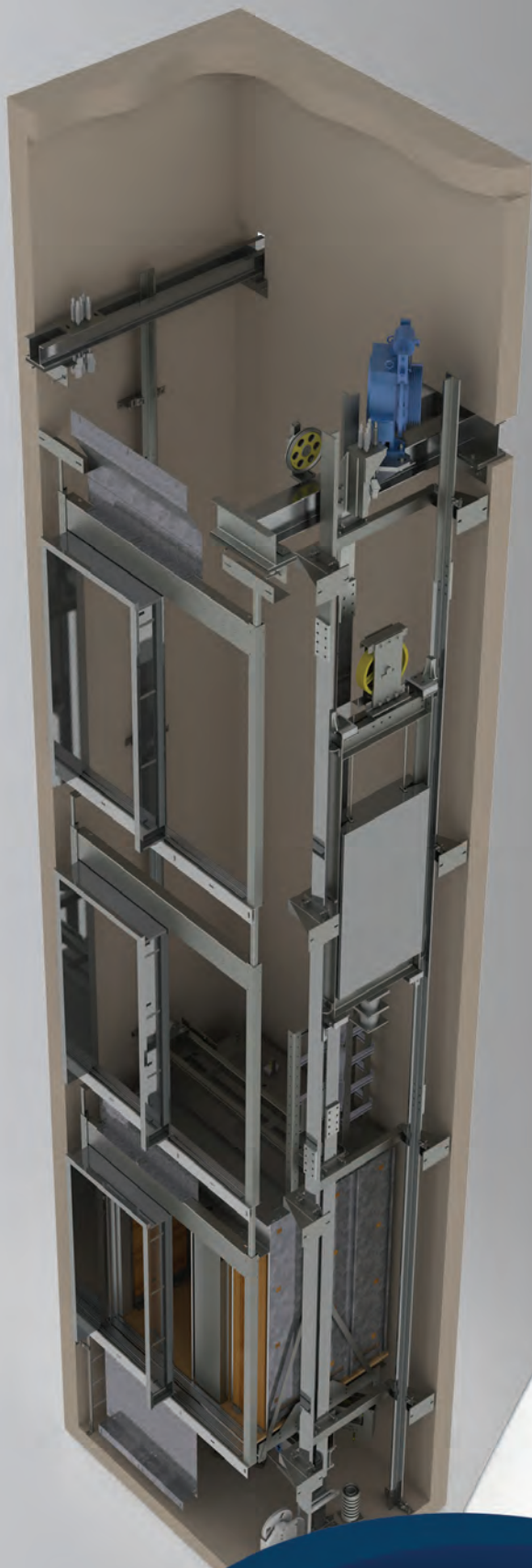
Custom cab interiors by Vasile Elevator

structural steel and I-beams, this special rigging allowed Suncoast to use the existing elevators to haul controllers and machines up to the top floor, where protection was built for the floors and walls. Once the equipment was brought to the rooftop, the special rigging allowed the equipment to be “hopscotched” in two different points on the roof at different elevations and safely swung into the machine room.

Suncoast performed the project with extreme care and professionalism. As a complete turnkey project, the contractor also was responsible for meeting electrical and fire service requirements along with replacing all wiring, controllers, machines and governors in the machine room. In the hoistway, all door equipment was replaced with GAL Manufacturing products, utilizing the MOVFR™ operator. Traveling cable, hoistway wire, hoist and governor cables were also replaced. In the elevator cab, MAD Elevator car operating panel touchscreens were installed, as well as MAD hall fixtures. Custom cab interiors were designed, manufactured and installed by Vasile Elevator of Fort Lauderdale, Florida.

Daniel Baltzegar is executive vice president, Sales and Marketing, at Vantage Elevator Solutions.





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Bill's Memo: A History of Fall Protection and Fall Protection Compliance

How a single decision made the industry safer for years to come.

by Ray Downs

In 1993, Otis Elevator North American Operations (NAO) President William “Bill” Miller sent a memo to all his divisions to address a recent run of accidents at Otis. His memo changed the way the elevator industry addresses fall protection – not only at Otis NAO, but at Otis worldwide and other companies around the world. No matter what company you work for – OEM, independent, union or non-union – chances are this affects you. It was a bold move at the time that prompted plenty of pushback – not only from field employees but managers, too, and, yes, I was one of them.

Bill began his memo by observing there had been a tremendous improvement in Otis’ overall accident rates, but that field associates continued to sustain serious injuries. He highlighted recent accidents in 1993 that resulted from failure to wear safety belts or harnesses, failure to tie off when working at heights or failing to follow Otis’ Lockout Tagout (LOTO) procedures. Over a seven-month period, Otis NAO experienced six serious accidents, all potentially fatal. Four were falls, and two resulted from failure to comply with existing LOTO safe work practices.

Those reading this article may or may not remember the safety belt. It was similar to the weightlifting belt you see used by powerlifters. Also, back in those days, lifelines were knobby cables and, when you tied off your snap hook to the lifeline, there were concrete knobs every 6 ft apart to stop the snap hook if you fell. Now, we have the cable grab!

In his memo, Bill summarized why he made his decision, highlighting a number of accidents that took place in Otis NAO. These included:

- ◆ A construction mechanic falling 39 ft in a duplex dumbwaiter hoistway. He sustained numerous injuries. He was not tied off because he had left his safety belt on the floor at the dumbwaiter entrance.
- ◆ A construction mechanic falling 20 ft while attempting to go from the top of one car to the platform of another. He was not wearing any fall protection.
- ◆ A construction mechanic falling 26 ft in the hoistway. His safety belt was in the trunk of his car.
- ◆ A construction helper falling 17 ft in the hoistway. He was not tied off.
- ◆ A construction mechanic receiving a disabling electrical shock when he came in contact with a live wire in a hydro tank. He had failed to LOTO the mainline disconnect.

The fall protection and LOTD topics are now part of the “9 Safety Absolutes” that are implemented throughout the

elevator industry today. The Safety Absolutes were developed by the National Elevator Industry, Inc., in partnership with the National Association of Elevator Contractors and the National Elevator Industry Educational Program. They are Fall Protection Safety Absolute 1 and LOTO Safety Absolute 4.

Bill went on to say there are no excuses. All associates must wear fall protection, tie off and fully comply with LOTO procedures. Thirty years later, I am sure we all fully support these statements.

Bill emphasized the same quality-of-life issues we promote today by saying, “We care about your safety; and your family cares, too.” At TEI Group, our motto is the same. We emphasize that “your family depends on you” to come home every night safe and sound.

What followed Bill’s memo was a mandate sent to all Otis divisions to be deployed throughout the entire workforce stating:

“Effective July 1, 1993, every field associate at construction jobsites must wear a safety belt or full body harness at all times while he or she is working and must also tie off any time he or she works at elevated levels of six feet or more where guardrails are not present to prevent a fall.”

By year’s end, all safety belts were replaced by a full body harness.

The seriousness of the above actions addressed accountability for those who did not abide by these rules, including management who arrived on a jobsite not wearing a body harness. Such an action would result in an immediate suspension without pay for two days. At the time, many felt this was excessive, but what it did do was set a standard for Otis that eventually the rest of the elevator world would follow. When you look back on his decision and mandate now, Bill was a visionary and ahead of his time.

He also addressed the LOTO issue, highlighting Otis’ written procedure found in its Employee Safety Handbook that covered LOTO and to which all construction and service associates were to strictly adhere. This procedure is the same one we deploy and implement today, 30 years later, throughout the elevator industry.

Bill saw the benefit of all construction and service department employees participating in weekly safety “toolbox talks” during which they would discuss topics relevant to the job(s) or task(s) at hand. We do the same today, forwarding to all, via text message, email or over phone messaging, a weekly toolbox talk. However, it is difficult to make sure everyone is

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READERS' PLATFORM

reading and discussing safety prior to a job starting. That remains our challenge today. Fast forward to 2023. Now, we ask our field associates to conduct a written job hazard analysis/ pre-task plan prior to the start of each task to address any unsafe conditions and take the necessary safeguards.

Bill closed his memo by observing suspension for not following the fall protection or LOTO procedures is not intended as punishment. The objective is to save lives and refocus all associates on the necessity of working safely. Let us work together to insist we all return home to our loved ones safely every night and make the elevator industry the safest industry worldwide.

My safety hard hat is off to [1993 Otis Elevator NAO President William "Bill" Miller] in appreciation for one decision that changed the way an industry addresses fall protection.

I worked under Bill as the Northeast regional manager for Environmental, Health & Safety (EHS), and hope you agree that our industry today is much better off because of leaders like him who took the position of safety and family first that paved the way for our safety programs of today. His vision and oversight when his memo hit the Otis divisions 30 years ago changed the

way Otis addresses fall prevention in the workplace and is now implemented throughout the industry.

In today's modern elevator industry, we see dramatic changes, including full body harnesses, vests and coverall bibs with the harnesses built right into them. We have stainless-steel lifelines made of cable without the concrete knob every 6 ft. We have barricades that meet or exceed OSHA standards. We have screening for the hoistway with pearl weave netting to avoid contact with the adjacent elevator car in a multibank system. Training has reached new heights among new hires, and seasoned employees that receive yearly fall protection training will participate in OSHA's Safety Stand Down Day to Prevent Falls on May 1-5. During this week, field teams will take a few minutes out of their day to discuss fall protection safety so no one places themselves in a fall hazard situation while working on a construction or modernization jobsite. Vital safety measures include wearing a full body harness and tying off when a fall of 6 ft or greater is present before the start of the task.

In closing, if you ever have to make a decision that is uncomfortable but right, like the one William "Bill" Miller did on June 16, 1993, just imagine how one decision can change an industry for the better and reverberate into the future. I extend to Bill and his family continued good health. My safety hard hat is off to him in appreciation for one decision that changed the way an industry addresses fall protection.

Be safe, and be well.

Ray Downs is Senior Vice President, EHS, at TEI Group.

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ELEVATOR WORLD

PEOPLE ISSUE & CONTEST SCHEDULE

**THE
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**PEOPLE ISSUE:
COMING IN THE JUNE ISSUE**

ELEVATOR WORLD'S 2023
**PHOTO
CONTEST**

**PHOTO CONTEST:
SUBMISSIONS CLOSE | MAY 31**



**PRODUCT OF THE YEAR:
SUBMISSIONS OPEN | MAY 1**



**PROJECT OF THE YEAR:
SUBMISSIONS OPEN | JUNE 30**



**ELLIES:
NOMINATIONS OPEN | JUNE 30**

Join us in celebrating the people, projects, companies and architectural imagery of the vertical-transportation industry. By participating, you allow us to showcase the many things that make our industry unique and essential. We look forward to sharing the details of them all with you this year.

www.elevatorworld.com



Preserving the Past, Elevating the Future



The Elevator Museum is now located at 77 Elm Street in Amesbury, Massachusetts.

One man's labor of love has grown into a full-fledged museum dedicated to the industry's history.

by Lindsay Fletcher

For Steve Comley, The Elevator Museum Inc. is a way of giving back to the vertical-transportation industry – a way to make up for actions he was asked to undertake when he was younger. Actions that were necessary, but ones he regretted even then.

One of Comley's first jobs was working for his father's elevator company: Embree and White Inc. Millwrights/Elevators, established in 1873. At age 14, he would help his

father clean up the shop on the weekends. The big bays would be full of old elevator drum machines and parts. "These machines were some of the most fascinating pieces of heavy-duty equipment I've ever seen. My job, unfortunately, was to get rid of them," Comley said. He would use a sledgehammer to smash them into pieces small enough to load onto a truck and take to the scrap yards.



Mechanical position indicator and hall call stations



The museum is home to historical artifacts from around the world.

Comley said:

"I remember asking my father why we had to destroy all these cool old machines that so few people had ever seen before and that would never be seen again. He explained they were removed because the old drum machines were too heavy to keep around, were no longer legal to install and would never run again. I literally felt bad about what I did. I knew the way in which they were casted was a lost art, and they were all made in the U.S. I personally destroyed many antique elevator machines, and now, I have to save some."

With the Elevator Museum becoming a nonprofit 501(c)(3) organization in 2019 and finding a permanent home in 2022, Comley, its founder and president, is doing just that.

After beginning his career with his father's company, Comley worked in the elevator industry for more than 43 years and held four licenses: Qualified Elevator Inspector (QEI); New Hampshire State Elevator Inspector; Massachusetts and New Hampshire elevator mechanic; and International Union of Elevator Constructors (IUEC) Boston Local 4 member. He said he worked on some of the oldest pieces of equipment in New England during his tenure and collected "every old elevator artifact I could throughout my career in hopes of building a museum someday." He added:

"I worked in the elevator industry because it's a fantastic job that required mechanical and electrical skills, neat old elevator shafts and interesting equipment. As a mechanic, I was paid well, and always working on different types of elevators and locations."

Elevator Museum History

Patrick Carr ran the Elevator Historical Society and Elevator Museum in NY from 2011 to 2016. It was originally located in the office/parts space of Carr's elevator consulting firm. Comley was a director of the Elevator Historical Society from 2013 to 2016, but the museum was never open to the public. Due to lack of support and funding, the museum had to close in 2016. Comley

Continued

“I personally destroyed many antique elevator machines, and now, I have to save some.”

**- Steve Comley,
founder and
president of The
Elevator Museum**



Various overspeed governors



Early 1900s Otis car switch

asked for the return of his artifacts, as well as those that belonged to his father, and Carr agreed.

During the summer of 2017, Comley made several trips back and forth to NY and brought many artifacts back to the meeting room of Boston IUEC Local 4. He purchased display cases and showcased the items there. Throughout the next two years, many more items were acquired from IUEC members from around the country, Boston Local 4 members and Carr.

In 2018, Comley was asked to remove the artifacts from the meeting room because the display was getting too big. That summer, he started the Elevator Historical Society Committee, through which he added board members and hired the Foundation Group, an organization that specializes in building nonprofits. He established The Elevator Museum Inc. as a nonprofit in 2019. The artifacts were housed in a building in Haverhill, Massachusetts, in 2019 before moving to the museum's current location at 77 Elm Street in Amesbury, Massachusetts.

The Elevator Museum Today

The Elevator Museum is now housed in a 2,400-ft², beautifully renovated mill building, complete with a working brewery on the first floor, and there are more than 4,000 elevator artifacts artfully displayed.

Some of the museum's key, one-of-a-kind artifacts include the 1908 ABSEE elevator machine from Mary Baker Eddy's mansion, the Otis flyball governor from the Mount Washington Hotel and the original certificates from the White House from 1953, 1954. The museum also features several hand-operated elevators, many of the original ink-on-linen Otis Brothers drawings and the original 1870s Otis Brothers Order Books.

“The people who visit are fascinated with the presentation we have, so I know we are headed in the right direction.”

- Steve Comley, founder and president of The Elevator Museum



The Elevator Museum has more than 4,000 artifacts on display.



American Standard safety code from 1937



Comley and museum mascot Boomer



Payne Elevator car switch

The artifacts come from all over the country and the world, and the museum continues to grow as Comley says he receives new artifacts from “elevator guys and gals” all the time. He recently received a call from someone with IUEC Local 1 in NY, who said they want to donate the old wooden escalator steps from the famous Macy’s Herald Square Department Store.

In its new location, the museum now gets regular visitors and positive feedback. Because of this, Comley says he knows he is doing the right thing by preserving the past. He added:

“I was an elevator mechanic and inspector my entire career but also a self-taught curator and tour guide. I love to walk people around and explain how important the elevator industry was to the development of this great country. People leave with a history lesson about the origins and purposes of the early elevators and how far we have come. The people who visit are fascinated with the presentation we have, so I know we are headed in the right direction.”

Moving forward, his goal is to expand the museum even more. He added:

“I want it to have many more different elevator machines, birdcage cabs and a horizontal piston, to name a few. A lot of the things I want for the museum are still out there, but getting them from there to here has always been the problem.”

Comley retired at the end of March with plans to work part time at the museum, expanding the number of days open from three to four. This will also allow him to pursue grant money for the museum. He said he hopes to soon have a full schedule of events planned. Truth be told, his ideas for the museum seem endless.

“The Elevator Museum has taken many years to get to where we are now, and we can’t look back,” Comley said. “It’s imperative that we preserve these incredibly rare artifacts as a collection for all to see. The Elevator Museum is preserving our past and elevating our future!” 🌐



1910 Sedgewick hand-operated elevator



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ELEVATOR WORLD Continuing Education Assessment Examination Questions

- ◆ Read the article “A Versatile Solution” (p. 55) and study the learning-reinforcement questions at the end of the article.
- ◆ To receive **one hour (0.1 CEU)** of continuing-education credit, answer the assessment examination questions found below online at elevatorbooks.com or fill out the ELEVATOR WORLD Continuing Education reporting form found overleaf and submit by mail with payment.
- ◆ Approved for Continuing Education by **NAEC for CET®**.

1. Wires inside coated ropes can have tensile strengths of up 3,500 N/mm².
A) True
B) False
2. Coated ropes in a single wrap configuration will commonly use a V-groove for traction.
A) True
B) False
3. Coated ropes require the ends to be seized with a heat gun.
A) True
B) False
4. D:d on a coated rope refers to the diameter of the coating versus the diameter of the rope inside.
A) True
B) False
5. The higher the E-Modulus is of a rope, the higher the stretch value?
A) True
B) False
6. What is a benefit of using coated ropes vs conventional steel wire ropes?
A) Coated ropes equally tension themselves.
B) Coated ropes do not have to be lubricated.
C) Coated ropes cost less.
D) All of the above
7. Why is a coated rope stronger than a conventional steel wire rope at the same diameter?
A) The coating greatly increases the strength of the coated rope.
B) The wires are higher strength than the wires in a conventional steel wire rope.
C) Because full seat U grooves are used with coated ropes instead of V grooves.
D) There is no difference in strength if it is the same diameter.
8. The traction coefficient of a PU-coated rope is _____ a conventional steel wire rope of the same diameter.
A) twice as much as
B) less than
C) up the three times as much as
D) the same, as long as the angle of wrap is the same as
9. The maintenance requirements of a PU-coated rope are
A) much more extensive due to the coating than that of a conventional rope.
B) no different than that of a conventional rope.
C) they are maintenance free.
D) much less than a conventional rope.
10. An elevator design benefit of using coated ropes instead of conventional ropes is
A) the car can be designed much lighter.
B) smaller motors can be used because D:d can be as low as 25:1.
C) smaller diameter ropes can be used because the wires are very high strength.
D) All of the above.

ELEVATOR WORLD Continuing Education Reporting Form

Circle correct answer.



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fluoramics.com



Fluoramics' Chain, Wire & Cable lubricant is available in aerosol spray cans, gallons and quarts.



Fall Protection Harness With Integrated Technology <

Global height safety specialist Guardian announced a partnership with Sweden-based twICEme® Technology AB that integrates technology allowing end users to enter personal data into Guardian's **B7-Comfort Harness**. In the event the person becomes incapacitated due to a medical or traumatic event, bystanders and first responders can access this data by tapping the twICEme symbol displayed on the equipment with a smartphone. Data such as allergies, previous injuries, emergency contacts, product information and more can all be uploaded to the user's profile via the twICEme app. Access to this safety information gives first responders a clear, efficient way to make decisions in case of an emergency when time is often critical. It can also be helpful to coworkers in the event something happens to a colleague on-site. Any personal data the user enters is stored locally on the chip for the sole purpose of providing quick and accessible safety information. The data is not sent or stored to any cloud-based system, making it only accessible via a smartphone with NFC (near-field communication) capabilities and the chip itself. Guardian Senior Product Manager Sean Wirth observed Guardian is the first fall-protection company in North America to incorporate twICEme's innovative safety technology into its harnesses.

guardianfall.com

Continued



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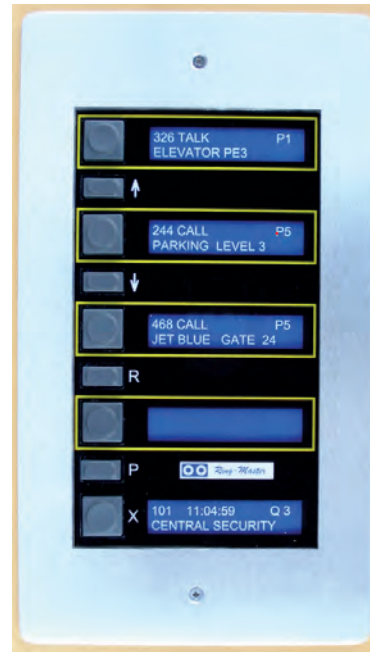
The **RM5000CX** is a fast access, compact microprocessor-controlled, intercom central exchange. The newest addition to Ring Communications Inc.'s product line, it is a feature-rich, smaller communication system that has its power supply and battery backup in a self-contained NEMA box. The capacity of the system is expandable from two to six in increments of one. Any combination of car stations, motor rooms and security desks can be used. If off-premise dialing is required, the CB434P PABX Interface may be added. The RM5000CX system offers the DS16, DAD104 and AA920 annunciator panels. The DS16 direct-

line annunciator panel with line supervision offers fast access communications, point-to-point communications, annunciation of calls, Americans with Disabilities Act compliance, off-premise dialing, single button call, all calls and group calls and ASME A17.1-2016 compliance. Additionally, the newly redesigned DAD104 annunciator panel has 32 alphanumeric characters to help identify the calling party. It allows queuing calls with eight prioritizing levels, and a touch of the button next to the display will put one in voice contact with the calling party, as well as camera access if one is interfaced to CCTV. All call and 15 group calls are built into the system along with multi-party conference and a manual push button to talk and listen.

ringcomm.com



RM5000CX



DAD104

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uvDevelopment.com



Continued

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The Safe T Riders program is administrated by the Elevator Escalator Safety Foundation. For more information about the Foundation, visit www.eesf.org.

The mission of EESF is to promote public safety and prevent accidents by educating the public on the proper use of elevators and escalators.



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- overviews of Units under Maintenance (UuM) and out-of-the-box enterprise resource planning (ERP) integrations.
- ◆ Mainteny CX – The “Customer Experience” application allows transparent, fast and real-time communication, boosting efficient customer interaction by 10 times. [mainteny.com](https://www.mainteny.com)



Sustainable Plywood for Elevator Interiors

Elevator interiors are as critical as the framework in both design and functionality. And now, with the push to net-zero carbon footprint objectives on the minds of many builders and property managers, sustainability is more important than ever in any elevator design. Add to this the countless elevators that need to be retrofitted and upgraded, especially if they are to meet today's building codes. The interior of an elevator is a high-traffic zone. It needs durable components and finishes to handle the foot traffic. Many elevator companies are turning to plywood as a sustainable solution. One company providing such a solution is Garnica, a global leader in manufacturing premium sustainable plywood. Its poplar panels are farm-grown in Europe, knot-free, flat and even, resulting in consistency and strength. Additionally, they are lightweight and durable. They come in a wide array of finishes, including rare woods, and can mimic the elegant wood paneling of yesteryear.

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[Garnica.one](https://www.garnica.one)

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● July 2023 Focus Topic ●

CABS AND DESIGN

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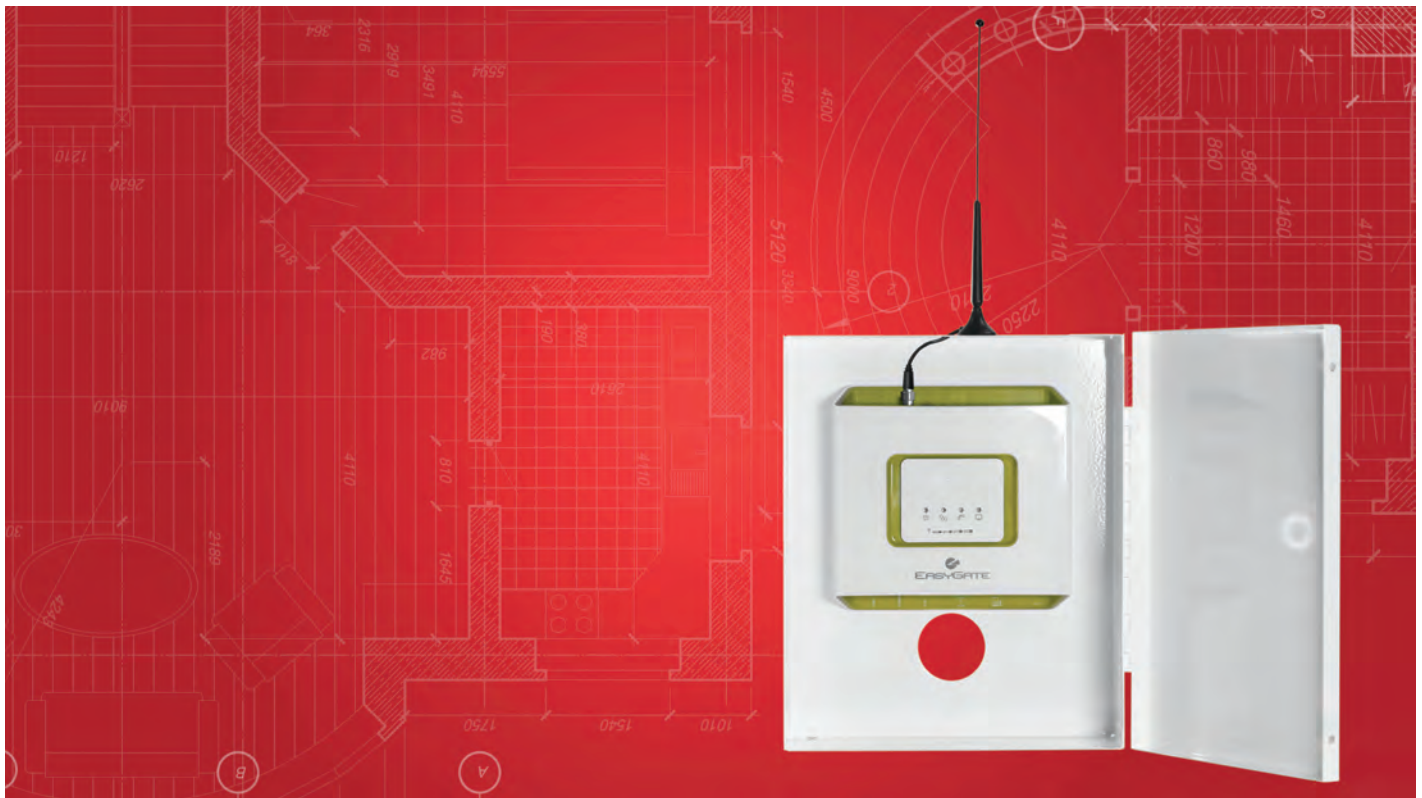
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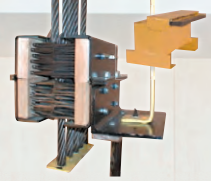
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“Castle” Lift Marks 125 Years of Continuous Operation

photos courtesy of Chuck Wright

A historic elevator in Lexington, Illinois, recently marked its 125th year in operation. The hand-pulled lift is original to the 1898-built David Hyatt Van Dolah House, known locally as “the Castle.” Originally designed by architect George H. Miller and his partner James E. Fisher for a prominent local landowner, the Queen Anne home now belongs to Chuck and Mary Wright.^[1] Chuck Wright reached out to ELEVATOR WORLD to share this milestone anniversary and pose a question: Can anyone document an older continuously operating original elevator? A new pull rope and brake rope are the only

changes made to the Castle’s Smith-Hill Elevator Company unit over the last century. Wright tells EW the four-stop elevator, which is inspected annually for safety, is a large dumbwaiter. The cab has a seat and fits four people – two most comfortably. The Wrights own and operate Castle Gardens, which includes the house, a 36-passenger miniature train and a locally restored antique carousel.^[2]

References

[1] en.wikipedia.org/wiki/David_Hyatt_Van_Dolah_House

[2] castlegardens.us



The David Hyatt Van Dolah House was listed on the National Register of Historic Places in 2015.



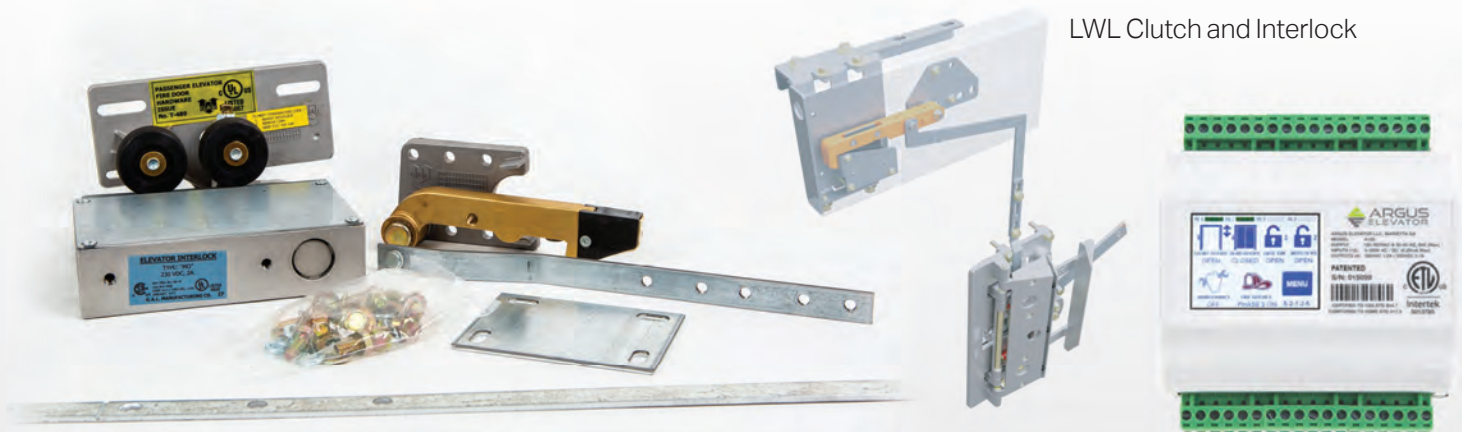
The wooden interior of the cab is original.



The elevator was manufactured by Smith-Hill Elevator Co. in Quincy, Illinois.

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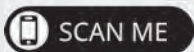
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