4TH QUARTER 2013

The Premier Magazine for the Building Transportation Industry in India

ELEVATOR WORLD India

Issue 4, Volume 6

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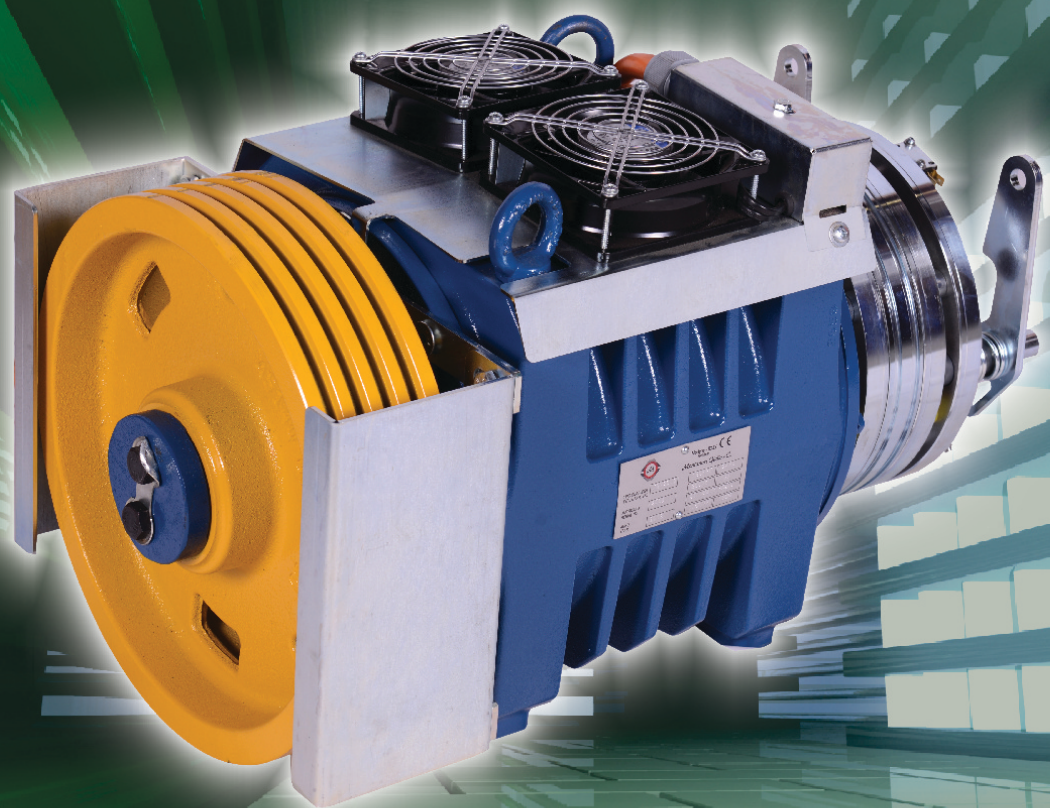

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Contents

4th Quarter
Issue 4, Volume 6
2013

COVER STORY

FEATURES

COLUMNS

DEPARTMENTS

ELEVATOR WORLD India

ELEVATOR WORLD India™

ELEVATOR WORLD India is a quarterly magazine published by Elevator World Inc., Mobile, Alabama (U.S.) and Virgo Publications, Bangalore (India). Virgo Publications is a sister organization of Virgo Communications, the organizers for IEE – International Elevator & Escalator Expo. Elevator World, Inc. is the premier publisher for the international building transportation industry. Since the inception of ELEVATOR WORLD magazine in 1953, the company has expanded core products to include ELEVATOR WORLD India, an extensive network of websites, a bi-weekly e-mail newsletter (Elenet®) and the Source©, the most inclusive industry directory.

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ELEVATOR WORLD India is published in the interest of the members of the elevator industry in India, to improve communication within that industry and to further continuing education of members of that industry. ELEVATOR WORLD India publishes articles by contributing authors as a stimulus to thinking and not directives. ELEVATOR WORLD India publishes this material without accepting responsibility for its absolute accuracy, but with hopes that the vast majority of it will have validity for the field. The ideas expressed therein should be tempered by recognized elevator engineering practices, standards, codes and guidelines. Publication of any article or advertisement should not be deemed as an endorsement by ELEVATOR WORLD India, ELEVATOR WORLD, the publishers at Elevator World Inc. or Virgo Publications.
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Guest Editor's Overview

Looking Forward to Brighter Days

by Amit Maitra

I'd like to extend a very warm welcome to all the readers of this issue of ELEVATOR WORLD India. It is indeed an honor and a privilege to be invited to be the guest editor of this issue of the magazine.

The elevator industry is currently witnessing a slowdown, driven mainly by the economic downturn that has impacted the construction industry. The state of the latter industry is discussed at length in Srini Vuruputur's article (p. 78). But, with steps being taken by the government to revive economic growth, we feel confident it is only a matter of time before there is a revival in activity, and that economic growth will spur increased business.

However, a larger concern remains on the human front. One learns of very frequent incidents experienced by lift users, be they related to safety, maintenance quality, delays in lift handovers or incorrect selling, among various other negatives. Soberman Engineering's Dhimant Unadkat discusses one such scenario in his comment "Elevators Will Rule – Time We Wake Up" (p. 6). Surely, such lean times provide an opportunity for elevator companies to invest in technical training, mainly to build up their skilled human-resource base. This way, when there is an upturn in the business cycle, there will be an adequate number of skilled technicians available to meet the market's needs.

Another area of concern is the licensing of elevators, which is now managed and controlled by the statutory authorities. It is a well-known fact that the number of inspectors available across the country is far short of what is needed to conduct new lift installation inspections and mandatory periodic inspection of installed units. Unfortunately, this has led to many unethical practices becoming a way of life, very often compromising the safety of lift users.

This situation leads to one wondering why it is not possible to have a system in place like the one in Singapore, where technically qualified and accredited private persons or bodies are authorized to inspect and certify units. We have a large pool of qualified engineers, many of whom can be trained and certified to conduct such work. A move in this direction will definitely help make our lifts and escalators much safer and raise safety standards across the country. We must make productive use of our vast pool of educated human resources to take our industry forward.

Amit Maitra is Managing Director for Lerch Bates Private Limited.

Calendar

To have an organization's meetings listed in the Calendar, send details to editorial@elevatorworld.com. Material must be received two months prior to the release of the issue in which you would like the event listed.

Legend
Charitable/social event (C)
Education/training (E)
Meeting/conference (M)
Trade show/convention (T)

2013

DECEMBER 2013

2-5 – LifTech Expo, Cairo International Convention Center, Cairo, Egypt. For more information, contact organizer Lead Trade Fairs at phone: (202) 2-505-2615 or 2-505-2815, fax: (202) 2-505-2615, e-mail: ashokry@ltf-eg.com, or website: www.ltf-eg.com. (T)

2014

FEBRUARY 2014

6-9 – IRAN LIFTEX 2014, Tehran International Exhibition Center, Tehran, Iran. This event is not associated with the Lift and Escalator Industry Association Trade Association or the event it organizes in London. For more information, contact (98) 21-26206727, (98) 311-6633939 or www.liftex.ir. (T)

27-March 1 – iptex 14, Bombay Exhibition Center, Mubmai, India. For more information on the third international gear and power transmission expo, contact T.J.P. Raju at phone: (91) 9845581689 or e-mail: raju@virgo-comm.com. (T)

MARCH 2014

5-7 – South-East European Exhibition on Elevators & Escalators 2014, Inter Expo Center, Sofia, Bulgaria. For more information, contact organizer Via Expo at e-mail: office@viaexpo.com or website: www.viaexpo.com. (T)

20-22 – International Elevator & Escalator Expo, Bombay Exhibition Center, Goregaon, Mumbai. For more information, contact organizer Virgo Communications at e-mail: info@virgo-comm.com or website: www.virgo-comm.com. (T)

APRIL 2014

21-24 – IAEC Forum, Sheraton Denver Downtown, Denver, CO. For more information, contact the International Association of Elevator Consultants (IAEC) at website: www.iaec.org. (M)

MAY 2014

7-8 – ELE-ESPAÑA, IFEMA, Feria de Madrid, Spain. For more information, contact Victoria Eskenazi of MarkExpo Ltd. at phone: (34) 933-801-261, fax: (34) 933-964-567, e-mail: victoria@markexpo.com or website: www.markexpo.com. (T)

16-19 – World Elevator & Escalator Expo, China Import and Export Fair Complex, Guangzhou, China. For more information, contact organizer China Elevator Association at phone: (86) 316-231-1446, fax: (86) 316-231-1447 or website: www.chinaexhibition.com. (T)

23-25 – INELEX Elevator and Elevator Technologies Exhibition, Izmir, Turkey. For more information, contact organizer Efor Fair & Organization at e-mail: info@eforfair.com or website: www.eforfair.com. (T)

JUNE 2014

3-7 – CECA Annual Convention, Quebec City, Canada. Contact organizer at website: www.ceca-acea.org. (M)

10-14 – International Mechanical, Electrical & Engineering Exhibition, Kuala Lumpur Convention Centre, Kuala Lumpur, Malaysia. For more information, contact UBM MALAYSIA at phone: (603) 2176-8788, fax: (603) 2164-8786 or e-mail: aseanmne-my@ubm.com. (T)

JULY 2014

8-10 – Elevcon Paris 2014, Novotel Paris. For more information, contact organizer the International Association of Elevator Engineers at website: www.elevcon.com. (T) (E)

AUGUST 2014

14-16 – Indonesia Lift & Elevator Expo, Jakarta International Expo, Kemayoran, Indonesia. For more information or to register, visit website: www.ina-liftelevator.com. (T)

SEPTEMBER 2014

8-11 – NAEC Annual Convention and Exposition, Henry B. Gonzales Convention Center and Grand Hyatt San Antonio, San Antonio, TX. For more information, contact the National Association of Elevator Contractors' (NAEC) Amanda Smith at phone: (770) 760-9660, fax: (770) 760-9714, e-mail: amanda@naec.org or website: www.naec.org. (T)

EDUCATION/ TRAINING COURSES

Elevate Training Course
Hong Kong – November 28, 2013
Elevate Training Course (advanced class)
Hong Kong – November 29, 2013
Elevate Training Course
Sydney – December 2, 2013
Elevate Training Course (advanced class)
Sydney – December 3, 2013
Elevate Training Course
London – March 13, 2014
Elevate Training Course (advanced class)
London – March 14, 2014
Elevate Training Course
New York City – October 21, 2014
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We invite comments from our readers at either the following postal, e-mail or Internet address:

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Website: www.elevatorworldindia.com

ELEVATOR WORLD India reserves the right to edit comments for length and clarity.

ELEVATORS WILL RULE – TIME WE WAKE UP

Elevators rule our everyday lives in India, and the day is coming nearer when there will never be an alternative, considering the tall residential projects rising across the country. On several occasions, I have climbed up six floors to reach my office, due to either cabling work being carried out by the electric company or the lift being under maintenance. With the present growth in India's number of tall buildings, we are going to live in the clouds, making good elevators vitally important. We all know that without decent elevators, the tall buildings across the globe cannot exist. I, for one, welcome KONE's revelation of a new lightweight carbon-fiber cable, which means a single elevator can now travel at least 1 km (ELEVATOR WORLD India, 3rd Quarter 2013). But, there are downsides.

When we reach the 35th floor of an apartment, instead of spectacular views, they are usually disappointing. When peering out the windows, only the windows of the other apartments' higher floors can be seen. Also, the tedious wait for the elevators to reach these apartments makes me think apartments closer to the ground level are better options. In addition, the quality of the air-conditioning in the lifts rarely matches that of the rest of the building. Often, there is also genuine irritation toward fellow passengers who press a floor button before yours when you are already running late.

So, I have nothing but the utmost sympathy for those poor folks in Princess Tower at Dubai Marina who found themselves with no lifts to serve the building's 97 residential floors after a faulty fire hose on the 96th floor flooded the hoistways on June 10. If I were already on the ground, I would have booked a hotel until it was mended. Or, if I were in my top-floor apartment, I wouldn't have gone out. I would have just ordered food deliveries…and promised an enormous tip.

Dhimant Unadkat
Head of Operations – India
Soberman Engineering Co.

PROFILE POPULAR IN THE INDUSTRY

I have received numerous calls from industry people on seeing the Industry Profile of myself (ELEVATOR WORLD India, 3rd Quarter 2013, "Mohamed Iqbal, EW Correspondent and Managing Director of Toshiba Elevators Middle East"). It is well done and wonderfully edited by your good selves. Hats off to the story's author, Associate Editor Lee Freeland! My past employer, Mitsubishi Electric, my present employer, various consultants and architects have contacted me in appreciation of the article. All the thanks and credits go to you.

I also read every letter and admired your quality of editing. I only would have been much happier if this picture of my beloved mum and me had also appeared.

Mohamed Iqbal
EW Correspondent
Managing Director
Toshiba Elevator Middle East (ME) LLC

Thank you for your kind words. We regret being unable to include the photo of you and your mother due to space constraints. However, we are happy to have the opportunity to include it below.

…Editor

Iqbal with his mother, Dawood Begum

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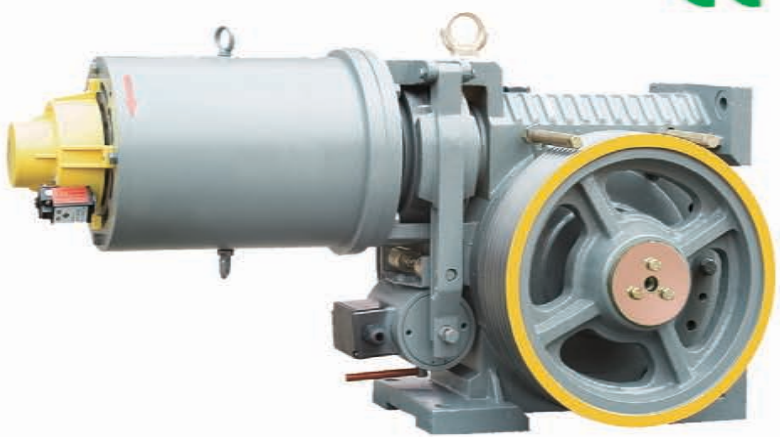

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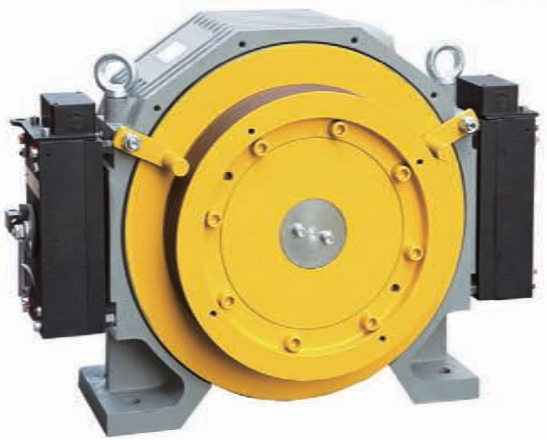

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Inside India News

12 NEW ESCALATORS IN PROPOSED DADAR UPGRADE

Twelve new escalators are included in a proposed plan to upgrade the rail station at Dadar, *The Times of India* reports. The plan, which would include improvements to foot overbridges, would be funded by an additional INR3.7 billion (US$56 million) in Mumbai Railway Vikas Corp.'s (MRVC) World Bank account as a result of the falling rupee. If implemented, the upgrade would bring the total number of escalators at Dadar to 18, which includes six that were previously approved. MRVC Managing Director Rakesh Saksena said state government, the railway board, World Bank and India's Department of Economic Affairs must approve the plan before it can proceed.

CANNY PROVIDING ESCALATORS FOR DELHI SUBWAY

Canny Elevator announced in July that it won the bid for the Delhi Subway Project. The work will see Canny install 291 escalators. The Shanghai Elevator Trade Association noted this marks the second time Canny has cooperated with India's public-transportation authorities. The project includes four subway lines (approximately 119 km long) connecting the main cities. Canny's work will be performed during 2013-2015 in preparation for the overall project's completion in 2016. At that time, Delhi Subway is to stretch 310 km and have 227 stops. An estimated 40 million passengers are expected to use the system daily.

REPORT: NATION AMONG ASIA'S STRONGEST MARKETS

India is the world's second-largest elevator market, next to China, and further growth is expected, according to "India Elevator and Escalator Industry Outlook to 2018 — Government Spending on Infrastructure to Steer Growth," a new report from Ken Research. Revenue from services more than doubled from fiscal 2007 to 2013, growing from INR8.4 million (US$132,723) to INR16.9 million ($US267,132), which reflects a compound annual growth rate (CAGR) of 12.3%. In fiscal 2013, India accounted for 6.8% of total installations worldwide, but was far outpaced by China, which held 65% of the market with 440,000 units installed. With a CAGR of 10% from 2007-13, India's new installations outpaced the worldwide average. Globally, new installations had a 5.2% CAGR over the same timeframe. Although the data includes escalators, the industry in India is primarily elevators, which account for nearly 95% of the total domestic vertical-transportation market. The report discusses prominent domestic elevator and escalator companies in India including Leo Elevators, Eskay Elevators, Escon Elevators, Beacon Engineering and Omega Elevators, as well as major global players such as KONE and Otis and their share of the India market.

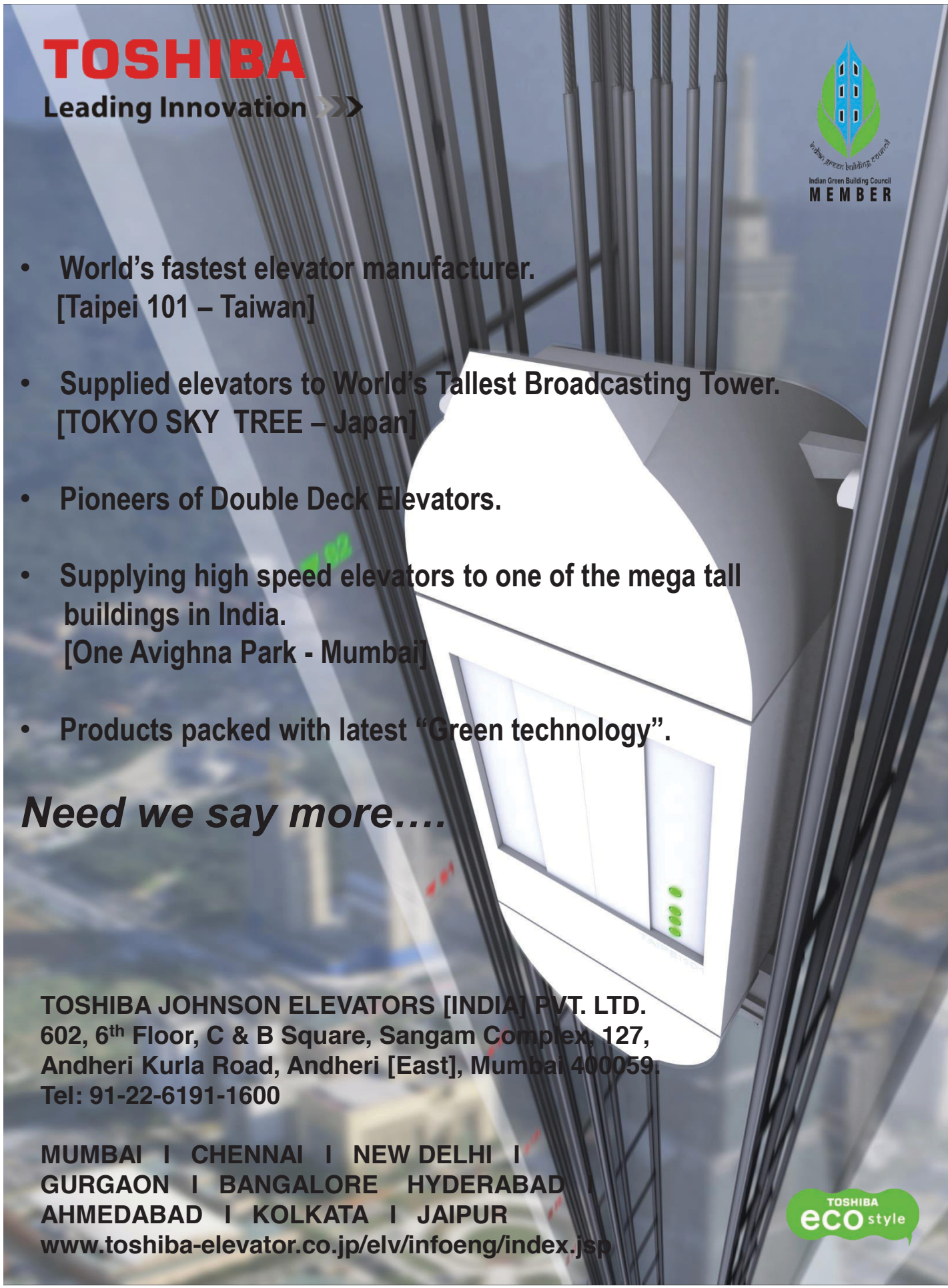
DELHI GOVERNMENT OK'S DRAFT LIFT/ESCALATOR BILL

The government of Delhi, the metropolitan region that includes the national capital, New Delhi, approved the draft Lifts and Escalators Bill 2013 on August 5. Should it gain passage, the bill would mark the first update of lift and escalator law since the 1939 Bombay Lift Act. The proposed law would regulate escalators (which are not addressed in the Bombay Lift Act), require operators to obtain government licenses and allow the prosecution of owners of malfunctioning lifts in which people are injured. "With installation of a large number of lifts, escalators and walkways, there is a need of better periodical inspection, testing and certification of lifts and escalators," Chief Minister Sheila Dikshit told the *Business Standard*.

PUNE RAILWAY STATION GETTING FOUR NEW ESCALATORS

Pune Railway Station is getting four new escalators, as well as a new, 5,700-m² parking lot, according to outgoing Division Railway Manager Vishal Agarwaal. *The Indian Express* reported Agarwaal told members of the media on August 1 that the first escalator will be installed

Continued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near the main booking counter. Agarwaal also said a detailed plan for improvements to the Shivajinagar Railway Station will be released.

LARGE ELEVATOR ORDER FOR NOIDA TOWERS

The Noida branch of ThyssenKrupp Elevator (I) Pvt. Ltd. North Zone has secured orders for 93 elevators to be supplied to two major residential projects from the Amrapali Group, a large and fast-growing real-estate developer operating primarily around Delhi and the National Capital Region. Fifty-seven TEC geared elevators, with capacities of 680–884 kg and a speed of 1.5 mps are to be supplied in 21 residential towers at Amrapali Silicon City. A further 36 units will be installed in 13 towers at Amrapali Princely Estate. The projects are adjacent in Noida, covering 60 acres. Elevator installation is scheduled to be completed by March 2014.

IQBAL PRESENTED MEDIAGUILD AWARD

Mohamed Iqbal, ELEVATOR WORLD correspondent and managing director of Toshiba Elevators Middle East (EW India, 3rd Quarter 2013), was presented one of the *Chennai Metro* newspaper's 12 MediaGuild 2011-12 Awards in August. A Tamil Nadu native, Iqbal is described by the paper as a "science writer and author of positive-thinking articles" and "a sure friend and guide for Tamils visiting [the] Middle East."

Chennai Metro recognized Iqbal for "creating multi awareness on self confidence and in social services." The newspaper cited his notable achievements, such as having worked on landmark Middle Eastern projects for Toshiba Elevators Middle East and his former employer, Mitsubishi Electric, as well as his regular contributions to EW and *Daily Thanthi*, a Tamil newspaper. The bilingual author is also a noted speaker and world traveler. Iqbal is no stranger to societal, literary and educational good-works awards, having been a 2009 recipient of the title "Samudhaya Sudar" ("Societal Flame") by the governor of Chennai.

ESCALATORS, ELEVATORS PROPOSED AT TATANAGAR RAILWAY STATION

Two escalators and two elevators have been proposed to help ease passenger traffic at the Tatanagar Railway Station in Jamshedpur, the second-busiest station in the South Eastern Railway (SER) zone behind Howrah, *The Times of India* reported. Escalators would link platforms two and three, and four and five, while elevators would be installed at platform one and between platforms four and five. SER General Manager G.C. Agarwal said air-conditioned VIP restrooms are on the drawing board, as well as a second entry gate. He did not give a timeframe for when improvements would occur. The second entry had been scheduled to open in June, but those plans were derailed by entry-gate encroachment issues.

METRO RAILWAY OFFICIALS PROMISE NEW ESCALATORS

Metro Railway has embarked on an INR220-million (US$3.6-million) plan to install 29 energy-efficient escalators at all of the system's 23 stations, except Noapara, over the next two years, *The Telegraph* reports. Two new escalators at Jatin Das Park station, near the Chittaranjan Cancer Hospital, are operational, and one each at Maidan, Rabindra Sarobar and Sovabazar-Sutanuti is expected to be in service by February 4. In all, the system has 64 escalators, which have a reputation among commuters of unreliability. Metro Deputy General Manager Protyush Ghosh said that existing escalators will be properly maintained. Another official explained that the plan is for all surface station entrances to have escalators from ground to mezzanine and from mezzanine to platform.

NEW ESCALATORS IN USE, TO BE INSTALLED IN RAIL STATIONS

An escalator has opened in the Vile Parle station in Mumbai, making Vile Parle the first Western Railway (WR) station to have such equipment. It also marks the second unit installed in the city's suburban system, following Thane, where a station received an escalator earlier this year. Located between the north ends of platforms 2 and 3, Vile Parle's escalator moves 9,000 commuters per hour. Other WR "Phase I" escalator installations are set for Dadar, Andheri and Borivli. WR "Phase II" installations are to come later at Bandra Terminus, Lower Parel, Goregaon, Mira Road, Bhayander, Nalasopara, Virar and Mumbai Central.

Central Railway (CR) has opened its second escalator between Thane station's platforms 5 and 6. This unit is a heavy-duty type built to withstand dust and rain. Other escalators are to be installed along the CR's lines at Dadar, Vikhroli, Thane, Kurla, Dombivli, Kalyan and Ghatkopar.

ELEVATOR, ESCALATOR IMPROVEMENTS AT RAIL STATIONS

Installation of five lifts and five escalators was to be complete at Vijayawada Railway Station as of press time, one of several improvements underway throughout the division, Divisional Railway Manager Pradeep Kumar told *The Hindu* in September. The Vijayawada lifts were scheduled

Continued

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to be operational by October, and two of the five escalators were in use in September. Improvements also included two lifts each at Rajahmundry and one at Eluru, and escalators at Guduru, Ongole and Samalkota.

ESCALATORS PLANNED AT CROWDED PATNA, OTHER RAIL STATIONS

East Central Railway plans to install escalators to ease passenger flow at a number of crowded stations, including Patna, Dhanbad, Muzaffarpur and Samastipur, *The Times of India* reported in July. Railway General Manager Madhuresh Kumar said details are being worked out but did not give a timeframe. Illustrating the railway's commitment to improving service despite having limited resources, Kumar said it has already installed new escalators at 13 stations, including New Delhi, Vijayawada, Pune and Chennai. Furthermore, he said, the railway has approved 100 additional escalators at 50 stations, including Patna, at a cost of INR300 million (US$5 million). According to the railway, about 100,000 people pass through the Patna station every day. New escalators, Kumar said, will help passengers reach foot overbridges and "prove a boon for senior citizens, elderly and women passengers," he said.

In Memoriam

BHASKAR W. KHANORKAR

Bhaskar W. Khanorkar, who worked in the elevator industry approximately 40 years, passed away on July 20. After completing his Engineering degree in the U.S., Khanorkar joined Otis in its Sales office. After a stint as Works manager, he returned to Sales. From there, he was deputed to Calcutta as Eastern Region manager. He then became the company's Marketing manager, India. He held that post until his retirement in April 1994. Trevor Rodericks, formerly of Otis India, noted many of the company's sales staff "will remember him with much respect, for he ingrained in them work ethics." Khanorkar was an active member of the Rotary Club. He is survived by his wife, Rajana, and son, Rahul.

PETER THOMSON

Peter Thomson passed away on August 11 at his home in Christchurch, New Zealand. Thomson, who retired in January 2009, served the industry for more than 50 years. He began as an electrical apprentice before joining Thomas L. Jones and Son Ltd. (later to become TL Jones) in 1959. He rose to become general manager before stepping back to the position of engineering manager in the 1990s after undergoing a heart transplant. He is survived by his wife, Sheryl, and daughter, Tracey.

Bill Seymour, former divisional CEO for Halma plc responsible for TL Jones and other companies, said of his friend:

"His resilience and strength of character really shone through in the subsequent years. [Thomson's] experience in the industry was unparalleled, having witnessed tremendous technological change. His expertise was vast ranging, from simple dumbwaiters to the commissioning of the fastest double-deck lifts in Europe of their day. A regular attendee at many trade shows, [he] was a pleasure to be with, a true gentleman always quick with a smile and fun to spend time with. . . . He was a true Kiwi ambassador. [Thomson] will be truly missed by all who knew him."

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Regional Industry News

Africa

SHENYANG BRILLIANT ELEVATOR EYES GROWTH

Chinese company Shenyang Brilliant Elevator Co., Ltd. has opened additional dealerships in Africa and is eyeing the continent for further growth, *China Daily* reports. Energy, infrastructure and government projects are driving elevator demand in Kenya, Nigeria, South Africa and Tanzania. The company believes this will help it establish itself in a continent dominated by bigger American, Japanese and European manufacturers. According to the China Chamber of International Commerce, more than 7,600 elevators were installed in Africa last year, representing a 12% increase. Shenyang said it sold 245 units in 13 African countries in 2012, compared with 11,000 units in China. In its effort to grow African market share, Shenyang intends to focus on maintenance contracts, as well as continue to help clients conserve energy to keep units running during often frequent power outages.

Australia

KONE LOGS ORDER FOR 23 UNITS AT BRISBANE OFFICE TOWER

KONE has booked an order for 19 air-conditioned elevators and four escalators at 180 Ann Street, a 34-story, 144-m-tall office building under construction in Brisbane. In line with the building's energy-efficient, smart technology, the order includes KONE's Polaris™ destination-control system with touchscreen panels, 15 MiniSpace™ elevators with a top speed of 7 mps, four MonoSpace™ elevators and four TravelMaster™ 110 escalators with a rise of 11 m. The building's 14 gearless passenger elevators will have an energy-conserving standby mode, and the equipment will be managed by KONE's E-Link remote-monitoring system. Scheduled for completion in 2015, 180 Ann Street includes a façade featuring an image of the Brisbane River.

China

CTBUH PLANS "FUTURE CITIES" CONFERENCE IN SHANGHAI

Chicago's Council on Tall Buildings and Urban Habitat is planning its next international conference, Future Cities: Towards Sustainable Vertical Urbanism, in Shanghai on September 16-19, 2014. Owners, developers, contractors, architects, planners, engineers, policymakers and others are invited to hear about and discuss topics such as improving tall buildings' physical, environmental, cultural and social contributions; achieving a harmonious whole through maximizing urban infrastructure, sharing resources and storing energy; and defining best practices in the next generation of urban living. Activities will include networking events and tours. Abstracts on proposed presentations are due January 14, 2014, and sponsorships and committee memberships are available. For more information, visit www.ctbuh.org.

Continued

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- Maximum/A95/Jerk Zone
- Peak to Peak

Performance (ISO18738)
- Velocity (Maximum & V95)
- Acceleration/Deceleration (Maximum, A95)
- Jerk (Maximum)

Diagnosis
- Drive Controller Function
- Locate Rail Joint Misalignment
- Guide Rollers
- Sheave(s)/Ropes/Counter Weight
- Frequency Analysis (FFT)

Documentation
- Ride Quality Report
- Pre-Bid Analysis
- Pre/Post Modernization Changes
- Year to Year Comparison

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- Step/Skirt Loaded Gap

Vibration
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- Hand Rail
- Machine

Performance
- Handrail/Step Speed
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SHANGHAI EDUNBURGH ELEVATOR UNVEILS RESEARCH CENTER

In July, Shanghai Edunburgh Elevator Co., Ltd. opened its 40,000-m², 21-story Global Research Center within the Caohejing Hi-Tech Park in Shanghai, the Shanghai Elevator Trade Association (SETA) reported. The center's focuses are research, marketing and training. Described by SETA as a company focused on safety and energy efficiency, Shanghai Edunburgh is also planning a high-tech business incubator.

OFFICIALS WELCOME "WORLD'S LARGEST BUILDING"

In early July, Chinese officials welcomed what they are calling the largest building in the world with the grand opening of the New Century Global Center in Chengdu. It has 1.76 million m² of floor space housing stores, offices and hotels. In addition, it includes a simulated environment with an artificial beach, a "sun" that shines 24 hours a day, a 14-screen IMAX theater, a replicated Mediterranean village, a professional ice-skating rink and a water park. A promotional video notes the development's 720,000-m² Central Business Plaza boasts 244 elevators. It also states there are even simulated ocean breezes. The structure, the architecture of which was inspired by undulating ocean waves, is approximately 500-m long, 400-m wide and 100-m tall – large enough to contain 20 Sydney Opera Houses, three Pentagons or four Vatican Cities, various news agencies observed.

SHANGHAI MITSUBISHI INKS 308-ELEVATOR DEAL

Shanghai Mitsubishi has signed an agreement with Sichuan Fulin Industrial Group Co., Ltd. to provide 308 elevators for 33 buildings in Mianyang, Sichuan, through 2016, the Shanghai Elevator Trade Association (SETA) reported. The deal includes six projects covering more than 1 million m². The agreement, according to SETA, promises to strengthen Shanghai Mitsubishi's position in Mianyang, and result in better products and services for customers.

XIZI OTIS SUPPLYING 172 ELEVATORS TO RESIDENTIAL TOWER

Xizi Otis Elevator Co., Ltd. is supplying 172 energy-efficient elevators to the high-end residential tower Phoenix, being built by Hebei Construction Group Co. in Cangzhou, the Shanghai Elevator Trade Association (SETA) reports. SETA describes the project as an "absolutely new high-class residence" in which developers invested approximately CNY6 billion (US$979 million). Xizi Otis, Otis's Chinese subsidiary, is one of the largest suppliers of lifts, escalators and moving walks in the Chinese market.

MAROHN ELEVATOR LANDS 72-UNIT CHINA CONTRACT

Marohn Elevator Co., Ltd., has won a contract to provide 72 elevators and escalators to the Heyday City development,

Continued

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Developer : M/s. Ireo Pvt. Ltd.

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according to the Shanghai Elevator Trade Association (SETA). Developed by Liaoning Xinhong Group, Heyday consists of nine buildings, including a high-end hotel, supermarket and business meeting hall representing 240,000 m² on 57,000 ha. Small-room, machine-roomless and observation elevators, as well as regular and walking escalators, could be part of the project, said SETA, noting that Marohn passed a strict inspection before it was awarded the work.

ELEVATOR/ESCALATOR CONTRACTOR PERFORMANCE RATINGS RELEASED

Hong Kong's Electrical and Mechanical Services Department has released performance results for 9,365 registered lift and escalator contractors from July 2012 to June 2013. The department found that 17 lift contractors and 11 escalator contractors had records that reflected full safety and maintenance compliance, and that six lift contractors and one escalator contractor were issued warning letters. Twelve lift and seven escalator incidents related to equipment failure were reported, the department said.

One may view full results, warning-letter summaries and equipment-failure records at website: www.emsd.gov.hk/emsd/eng/pps/le_pub_mpr.shtml. In conjunction with the Lift and Escalator Safety Advisory Committee, the department is conducting a review of the contractor rating system and invites public comment at e-mail: info@emsd.gov.hk.

TONOGYONG ELEVATOR ESTABLISHES TEST TOWER

Tonogyong Elevator Manufacture Co., Ltd., has started building a 95.3-m-tall steel test tower in Xianyou County, China, the Shanghai Elevator Trade Association reported. The company invested approximately CNY120 million (US$19.6 million) in the project, which includes a practice basement for students and a 100-car parking lot. Construction is expected to be complete in February 2014.

EHC GLOBAL WELCOMES NEW SHANGHAI FACTORY

In June, EHC Global, an international elevator and escalator product provider headquartered in Canada, celebrated the grand opening of its 10,000-m² factory in Shanghai. The manufacturing facility is "dedicated to the advancement of TPU handrail and belt technologies" and will employ 250 people, according to EHC. Seventeen guests joined members of EHC Shanghai's management team during the event, which included a facility tour.

Stanley Shao, EHC Shanghai executive advisor, delivered welcoming remarks, and Ron Ball, EHC Global founder and EHC Shanghai chairman and managing director, spoke about the division's history and his own experience as part of the "fantastic evolution in China" over the past 15 years. Eric Pelletier, vice consulate general of Canada, and Zhang Yu Li, Malu town mayor, also spoke, with Zhang stressing the importance of EHC to the local economy.

Sergio Garcia, EHC Shanghai vice managing director, and Sun Wei, deputy head of Jiading District, joined Ron Ball and Eric Pelletier to declare the official opening by cutting the ribbon.

AVIRE MOVES INTO EXPANDED FACTORY

Avire, provider of elevator safety and communications technology, has moved into a new Shanghai factory three times the size of its previous one. The move brings Avire's

light-curtain production capacity to more than 500,000 per year, allowing the company to better serve China's quickly growing commercial, mixed-use and residential markets. "China has become the global center of the elevator industry," stated Avire. "Sixty percent of the world's new elevators are now built in China." Located in Shanghai's Minhang District, the facility includes an R&D lab focused on new products for growing markets in China and the Asia-Pacific region. Avire's former factory opened in 1999 to produce TL Jones light curtains.

(l-r) Sales and Marketing Director Andy Harbidge, Halma China Director Martin Zhang, Chairman Nigel Trodd, Managing Director Paul Simmons, China General Manager Jonathan Hou, Manufacturing Director Jan Doubal and R&D Director Karl Westhead officially open the new production facility in June.

ELEVATOR COMPANIES FORM INDUSTRIAL CLUSTER

Elevator companies such as Shenyang Brilliant Elevator Co., Ltd. and Xizi Otis have set up shop in Liangjiang New Area to supply the burgeoning Chinese market, the *Daily Economic* reports. The area offers cost and logistics advantages, allowing the companies to efficiently serve markets including Sichuan, Guizhou, Yunnan, Shaanxi and Shanxi. Pointing out that China is the world's largest elevator producer and consumer, the newspaper said the city of Chongqing alone is expected to demand 20,000-30,000 elevators each year.

KONE LANDS 165-UNIT ORDER FOR MIXED-USE PROJECT

KONE has won a contract to supply 165 units to the Shanghai mixed-use project Dazhongli, scheduled for completion in phases starting in 2016. The units, which boast an array of energy-efficient features, include 58 MiniSpace™ elevators, 49 MonoSpace® elevators and one TranSys™ vehicle elevator, as well as 57 TravelMaster® escalators. A joint project of developers HKR International Ltd. and Swire Properties Ltd., Dazhongli is envisioned as having two office buildings, a shopping mall and three luxury hotels covering 323,000 m^2. KONE noted the taller of the two office buildings will represent its highest project in Puxi, Shanghai's historic center.

Europe

LIFTACADEMY TRAINING FROM LIFTINSTITUUT

Liftinstituut Solutions now offers a range of courses on vertical transportation, related technology and safety issues. Intended for engineers and managers, whether or not they work in the lift industry, these practice-based courses from field professionals teach participants about the technology and safety aspects of lifts, escalators and suspended access equipment. A course on EN 81-1/2 Amendment A3 will be presented by Wietze Visser on October 24-25 in Istanbul. The 2009 amendment has been mandatory in Europe since 2012 and consists of modifications to safety guarding, speed, unintended car movement, and stopping and leveling accuracy.

Courses on programmable electronic systems in safety-related applications (PESSRAL) are offered in response to a trend that more elevator/escalator systems include electrical and/or electronic elements used to perform safety functions. EN 81 and EN 115-1 even include Safety Integrity Level requirements for safety functions or make reference to such standards as IEC 61508 and 62061, and ISO 13849-1/2. LiftAcademy training offers the fundamentals of functional safety and a roadmap of how to deal with issues encountered during the development of a PESSRAL system. Intended for project managers in the elevator/escalator industry, consultants and those in industry R&D, this year's PESSRAL courses are presented by Ron Bell and Pieter Schaareman on September 10-12 in Istanbul; November 12-14 in Frankfurt, Germany; and December 10-12 in München, Germany.

Courses on risk assessment and EC type examination explain what a risk assessment is and why it is important. They also show how to make a risk assessment and are intended to enable trainees to conduct their own risk reviews per EN-ISO 14121-1 and 14121-2, and ISO 14798. The target group for these presentations includes constructors of elevator companies, maintenance engineers and supervisors, and consultants. Willem Kasteleijn will present one such course on September 25-26 in Istanbul.

Other LiftAcademy training courses on aspects such as liberating entrapped passengers and first-line elevator control and troubleshooting are also offered. For more information, contact Dennis Lindeboom at phone: (31) 6-520-84-107 or visit website: liftinstituutsolutions.com/training. For courses in Turkey and the Middle East, contact Süleyman Özcan at phone: (90) 5303203167.

Continued

Indonesia

EHC GLOBAL BRINGS PRODUCTS, SERVICES TO REGION

Industry provider EHC Global has expanded its reach into the region with a licensee agreement with longtime business associate PT. Pillar Utama Contrindo of Bandung. PT. Pillar now represents EHC products throughout the region, a market Jeno Eppel, president of EHC Global, described as "quickly on the rise." Founded in 1995 as an elevator installation and maintenance company, PT. Pillar has more than 450 employees and offices in all major cities of Java Island. EHC Global manufactures and distributes products including elevator rollers and guide assemblies, and escalator handrails and handrail signage.

Iran

DUAST ESTABLISHES MASTER'S PROGRAM, BUSINESS INCUBATOR

Damavand University of Applied Science and Technology (DUAST) in Damavand City will be accepting full-time students in its Elevator/Escalator Engineering Master's program in January 2014. The 20-year-old school is joined by the U.K.'s University of Northampton to represent the only two universities that educate students from Associate's to Master's degrees in this major. It is one of 22 majors related to the elevator/escalator industry offered by DUAST. The Elevator Master's course is composed of six theoretical courses (prerequisites), 14 specialized theoretical courses, six group-project courses, two seminar courses and 10 specialized-project courses. Over their estimated two-and-a-half years in the program, students will design, calculate, optimize and manufacture elevator safety components.

Inside the elevator workshop

Dr. Ruzbeh Mirabdollah Yani, president of DUAST and manager of the recently established Business Incubator Center of Elevators and Escalators Cluster (BICEEC), commented on his school's indebtedness to the University of Northampton and its professors:

> *"We are going to enter into a joint cooperation contract between our university and the University of Northampton to be able to have student and professor exchange to make academic and research ties in order to promote [a high] academic level [for] professors at this university, then to upgrade our university, especially in postgraduate education. In our short-term planning, [DUAST] was expected to hold the first international scientific conference on vertical transportation in the Middle East (ICVT); we will definitely invite professors from the University of Northampton to [be part of] the conference jury."*

BICEEC, founded on the grounds of DUAST, now accepts professors, students, and Iranian and foreign experts in the field by request. An administrative facility has been set up for the purpose, and accepted companies can use the university's specialized workshop for modeling and limited manufacturing from its development center.

Business incubators are research and scientific towns that facilitate the commercialization of research ideas by new companies, beginning by providing support during the "preliminary development" development stage. This period is normally six to nine months, when startups can benefit most from the consultation and support of the development center to establish a legal knowledge-based company. A further period of three to four years, while companies are introduced to banks and financial institutes, then utilize public loans, follows the first stage. At the end of the development period, companies successful in commercializing their ideas can relocate as tenants in town manufacturing units, and produce and sell their products. Until enrolled companies stay in the town, they enjoy customs and tax exemption, and low-interest public loans.

Yani hopes the program can help at least 32 knowledge-based companies achieve commercialization over a five-year period. He added that the development center will establish a central holding company and an international elevator brand. Participating companies are to operate as members of the holding company and receive its financial and scientific support. He explained that BICEEC's towns and technology-development centers were influenced by the U.S. and have shown dramatic results through scientific and financial synergy. Also, with close proximity to the university, the research towns should enjoy absorption and employment of most local graduates, which come from the pool of 800,000-plus students attending the overall University of Applied Sciences and Technology to gain

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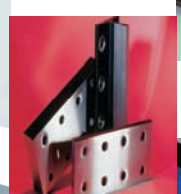

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Nigeria

ELEVATOR/ESCALATOR SCOFFLAWS FACE JAIL, FINE

Elevator/escalator operators who shun regulations face one year in jail or an NGN500,000 (US$3,070) fine, the *Daily Times* reports. Minister of Labour and Productivity Emeka Wogu cited an increasing number of accidents caused by faulty installations and maintenance as the reason for implementing the penalties. "The need to issue a regulation on lifts, escalators and conveyors arose from a noticeable gap in our effort to protect all Nigerians at work in places where lifts, escalators and conveyors are put to use," Wogu said. "This gap has manifested in the form of increasing frequency of accidents, injuries and deaths associated with lifts, escalators and conveyors."

Oman

TECHNO ELEVATORS ACHIEVES ISO CERTIFICATION

Techno Elevators, LLC, authorized Hyundai Elevator distributor, announced it has been awarded the International Organization for Standardization (ISO) 9001:2008 certificate for successfully supplying, installing and maintaining its products. An emphasis on quality since the company was founded in 1995 helped Techno achieve the recognition, company officials said. "We have been focusing on quality of installation and maintenance of elevators from the inception of the company, which has really paid off today, as more than 250 elevators are operational, with an additional 100 elevators under installation," Techno Chairman Shabbir Boriyawala stated.

Saudi Arabia

KONE TO SUPPLY ELEVATORS AT REZIZA TOWER

KONE has been hired to install five 2.5-mps MiniSpace® elevators at the Reziza Tower in Al Khobar. The project is expected to be complete in July 2014. The Riyadh office of Dewan Architects & Engineers designed and is supervising construction of the 18,000-m² tower, which will have ground-floor retail, basement parking, four mezzanine floors and 28 floors of office space. Dewan said that, when finished, the tower is expected to be "an architectural landmark of the region." KONE has performed previous work in Al Khobar, having supplied and installed six, 4-mps MiniSpace® and one, 1-mps MonoSpace® elevator at the 135-m Al Khobar Gate Tower in 2011 (ELEVATOR WORLD, January 2011).

South Korea

PERMIT GRANTED FOR SEOUL'S 450-M-TALL TOWER INFINITY

In September, GDS Architects announced it was granted a construction permit for Tower Infinity, a 450-m-tall building just outside of Seoul near Incheon International Airport. GDS, Samoo Architects and A&U comprise a team that won an international design competition in 2011 to build a new national landmark. GDS Principal Charles Wee described Tower Infinity as "the world's first invisible tower, showcasing innovative Korean technology, while encouraging a more global narrative in the process." Scheduled for completion in 2014, the tower will boast a 392-m-tall observation deck and LED-screen technology that captures real-time images of its surroundings, in turn creating a camouflaging effect.

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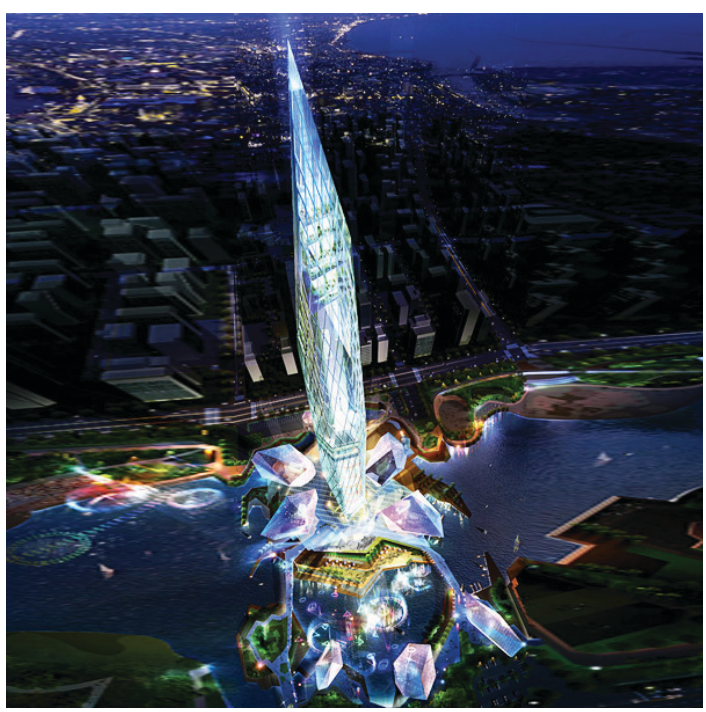

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Sri Lanka

LANDMARK TOWERS POISED TO TAKE SHAPE IN COLOMBO

Condominiums in the mixed-use, four-tower Krrish Square in Colombo are now for sale, developer Krrish Group, based in New Delhi, India, announced in September. Krrish plans to break ground before year's end and has a targeted completion date of 2016. Covering 4 acres, the project comprises the historic Transworks House, which will be preserved; one 90-story and two 65-story residential towers; and a 95-story tower containing hotel and office space. "The project is one of the most significant milestones in urban development in Sri Lanka," Nimal Perera, chairman of the Urban Development Authority, told newspaper *Daily FT*. At US$460 million, Krrish Square is the largest foreign investment project in the country, the newspaper noted.

Thailand

MITSUBISHI ELECTRIC TO SUPPLY 38 UNITS TO BANGKOK TOWER

Mitsubishi Electric announced it will supply 38 elevators and escalators to the mixed-use MahaNakhon project, which, when completed, will include Bangkok's tallest building at 314 m. Seven elevators will travel at a speed of 8 mps, making them the fastest in the city. Two of the high-speed elevators will be shuttles in the taller of two towers, running nonstop from ground to observation floor in 1 min. Fifteen of the elevators promise to reduce energy consumption through an electricity regeneration function. Located in Bangkok's central business district, MahaNakhon will have a lower tower housing commercial tenants. The higher, 77-story tower, which has a unique, "pixelated" design, will house retail, a hotel and apartments. The project is scheduled for completion in 2015.

Turkey

THYSSENKRUPP TO SUPPLY 346 UNITS FOR TUNNEL PROJECT

ThyssenKrupp Elevator has been tapped by Spanish joint venture Obrascón Huarte Lain and Invensys Rail Dimetronic to supply 191 elevators and 155 escalators for a 13.6-km-long rail-tunnel project linking Europe and Asia across the Bosphorus Strait. Geared toward easing traffic congestion in Istanbul, the Marmaray project includes improvements to 63 km of track and the construction of 36 stations. ThyssenKrupp Elevator's lifts and escalators will be able to withstand "intense use and extreme weather conditions," according to the company, and will include numerous panoramic elevators. The tunnel is expected to start operation in late October, and the upgraded track and stations are expected to be complete in 2015.

GEFRAN ESTABLISHES ISTANBUL SUBSIDIARY

In October, Italian electronics company Gefran announced a new Istanbul subsidiary offering onsite technical support to local customers. Gefran entered the Turkish market 14 years ago when it established relationships with local distributors and lift-system providers. "Turkey has always been a strategic market," the company noted. "It is among the top 20 emerging economic powers, along with China, Brazil and India, where Gefran [has been] present for years with numerous and strategic development programs." Gefran provides an array of inverters used in passenger and freight lifts.

Continued

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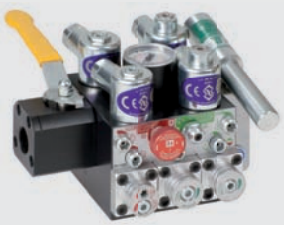
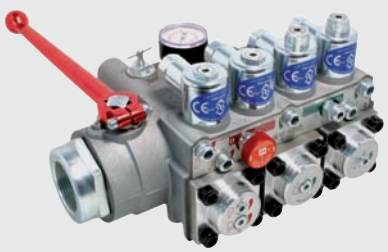
Elevator Control Valves



EV 100 ¾“



EV 100 1½“ - 2“- 2½“

KV ½“

GV ½“

R10 Rupture Valve

L10 Pressure Lock Valve

U.A.E.

STRIKING DESIGN FOR MASHREQ BANK TOWER UNVEILED

Skidmore, Owings & Merrill (SOM), the architecture firm behind One World Trade Center in New York City and Burj Khalifa in Dubai, has released renderings of the 32-story Mashreq Bank Headquarters it is designing in Dubai, *World Architecture News* reports. The design features a cantilevered deck landscaped with palm trees at the base of a rectangular void. High above, a boardroom hangs suspended. Besides its upper stories and an eight-story base containing a conference center, auditorium, banquet hall and parking, the remaining floors, due to the building's design, are L-shaped and let in natural light. SOM Design Director Ross Wimer stated: "We designed the building to act as a quiet sculptural form within Dubai's skyline. The building is environmentally appropriate, while using clear glass."

Vietnam

MITSUBISHI ELECTRIC STRENGTHENS FOOTHOLD IN GROWING MARKET

Mitsubishi Electric has converted joint venture Melco Elevator Vietnam Co., Ltd. to subsidiary Mitsubishi Elevator Vietnam Co., Ltd., with the purchase of additional Melco shares. The move allows Mitsubishi Electric to further expand in the growing Vietnam market. Having done business in the country since 1973, Mitsubishi Electric has provided elevators and escalators to the Sheraton Saigon Hotel & Towers and the Tan Son Nhat International Airport in Ho Chi Minh City, among others. In conjunction with Toan Tam Engineering Co., Ltd., in 2008, it established Melco to engage in sales, installation and maintenance, and has a distributorship agreement with Thang Long TLE Group. Mitsubishi Electric estimates it holds approximately 20% of the market. "In recent years, demand for elevators and escalators in Vietnam has exceeded 4,000 units annually and is expected to continue rising," Mitsubishi Electric said.

Worldwide

CTBUH HONORS TALL BUILDINGS, INNOVATION, PERFORMANCE

The Council on Tall Buildings and Urban Habitat in Chicago has bestowed its 2013 honors for "Innovations," "Best Tall Buildings" and the "10 Year Award," which recognizes proven performance over at least 10 years. In tall buildings, the four regional winners are, for the Americas, The Bow in Calgary, Canada; Asia and Australia, CCTV Headquarters in Beijing; Europe, The Shard in London; and Middle East and Africa, Sowwah Square in Abu Dhabi. An overall winner will be named during the council's annual awards dinner at Crown Hall in Chicago on November 7. Besides being honored at the awards dinner, winners will be featured in the annual CTBUH Awards Book.

The council's 2013 Innovation winners are: Broad Sustainable Building's prefabricated construction process, which facilitated the building of a 30-story hotel in 15 days in Changsha, China, using preassembled components, and KONE UltraRope™, a new, ultra-light hoisting material that doubles the distance an elevator can travel (ELEVATOR WORLD, August 2013). The finalists are: The building team for the Nakanoshima Festival Tower in Osaka, Japan, for its use of megatruss seismic isolation structure, and the building team for Tour Total in Berlin for its use of a raster façade precast system.

Continued

The Gherkin

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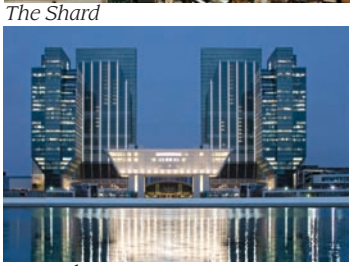
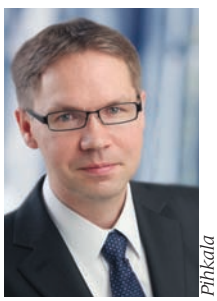

Sowwah Square

The 10 Year Award honoree is The Gherkin at 30 St. Mary Axe in London. CTBUH Executive Director Antony Wood said the building, completed in 2003, "changed the landscape with respect to what's possible" and changed thinking about tall buildings in London and beyond. Among its benefits: programmatic flexibility; energy-friendly, naturally ventilated social spaces and ample, protected public space at ground level.

CTBUH said the innovation honorees promise "to revolutionize the technology sustainability and efficiency of tall-building construction and operation." A panel of industry experts, meanwhile, selected the tall-building winners from more than 60 contenders, recognizing projects they felt made "an extraordinary contribution to the advancement of tall buildings and the urban environment and achieving sustainability at the broadest level."

KONE APPOINTS PIHKALA TO GLOBAL LEADERSHIP POSITION


Pihkala

KONE has appointed Tomio Pihkala to executive vice president over Installation, Quality and Safety, reporting to KONE CEO and President Matti Alahuhta. Pihkala holds a Master's degree in Mechanical Engineering, most recently leading KONE's R&D Center in Hyvinkää, Finland. His other former positions with KONE include manager of the Toshiba alliance in Japan, director of Product Strategy and Marketing in China and director of Service Business in China. Alahuhta said, "[Pihkala's] strong technological competence and his wide experience in KONE business, both globally and in the Asian markets, are an excellent background for the job."

EMPORIS AWARDS "BEST NEW SKYSCRAPER"


The winners, Absolute World Towers, stand 176 and 158 m tall, respectively (© Edvard Mahnic).

The Emporis Skyscraper Award for 2012 was presented to the Absolute World Towers in Mississauga, Canada, in September. An international jury of experts selected the two towers from more than 300 skyscrapers at least 100 m tall completed last year. This year marked the 13th time international provider of building data Emporis presented the award. Absolute World Towers form part of a five-building complex and were designed by architects MAD and Burka Architects (ELEVATOR WORLD, October 2011). Their "unmistakable design" was noted as a tipping point in the contest, with the judging panel remarking, "The way the two structures twist organically by up to 8° per floor is not just a superb technical achievement, but also a refreshing change to the set forms of high-rise routine."


Al Bahar Towers came in second place and rise 145 m (© AEDAS).

The second-place project is Al Bahar Towers in Abu Dhabi, designed by Aedas Architects. An innovative rotating façade that leads to a substantial reduction in thermal energy inside the buildings stood out to the judges. Burj Qatar, a 46-story skyscraper in Doha, Qatar, was voted into third place. Again, judges noted an exceptional façade in the Ateliers Jean Nouvel-designed structure. It is also intended to contribute to protection from the sun, revealing a complex pattern at close range.

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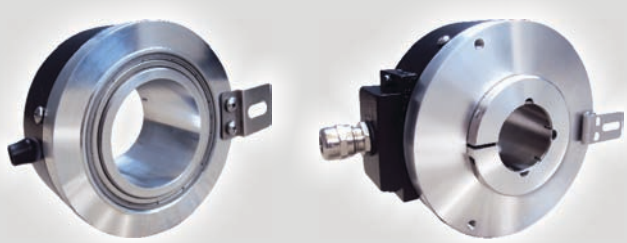

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NBSL Chairman Talks Trends, Strategy

NBSL Elevator Components Group manufactures core elevator components. After 30 years of sustained growth since its founding in 1983, NBSL has become one of the largest component manufacturers in China, where it has more than 30% of the market, thanks in part to its acclaimed overspeed governor. Its main products have passed consumer electronics and TÜV certification, and are fire rated. NBSL maintains relationships with major elevator companies, including Shanghai Mitsubishi, Otis, KONE, Fujitec and ThyssenKrupp Elevator. Its products are exported to more than 30 countries in Europe, the Middle East, Southeast Asia and South America. Recently, ELEVATOR WORLD India (**EWI**) sat down with Guoping Lu (**GL**), chairman of NBSL, to discuss global and domestic market trends and company strategy.


Guoping Lu

EWI: As one of the earliest entrepreneurs of elevator-component business in China, could you share some insight on business-development strategy with your counterparts in India?

GL: Significant development of the elevator-components industry in China has mainly been driven by sustained, rapid development of the industry over the last two decades. In the meantime, larger-scale elevator-components companies with brand influence have been cultivated. Today in China, the elevator-components market pattern has basically been established.

Regarding future development of elevator-components enterprises, each company is constantly seeking and exploring the best development model. Personally, I think the large elevator-components companies should pay more attention to the model of scale and globalization, and the medium-sized and small elevator components companies should focus on a model of differentiation and specialization.

Large elevator-components companies should first focus on product development and innovation to provide more advanced, competitive products for elevator companies. Second, they should consolidate existing markets and customers, and cooperate strategically with world-famous elevator companies and components companies. This will enable them to establish a strong foothold in the domestic market, while also expanding in the international market, which leads to enterprise scale and global development.

Medium-sized and small elevator-components companies should first focus on the special needs of market segments, and actively identify target markets and clients. Second, they should cooperate with counterpart manufacturers, realizing it is mutually beneficial to provide complementary products. Third, they should focus on product R&D, which will improve competitiveness in their specific area of expertise. Fourth, they should improve customer service in terms of quality, delivery and after-sales service.

Of course, companies' development models will vary based on their individual processes, scale and strategic positioning. However, as long as they are realistic in formulating a development model suitable to their individual enterprise, I believe they will see rapid development.

EWI: In light of macroeconomic fluctuation and the impact of the ailing housing market, how do you see the elevator industry in China in 2013 and beyond?

GL: On the one hand, overcapacity in the elevator industry leads to intensified competition. On the other, the status of the real-estate industry as a foundation of the national economy has not changed. Housing needs created by increasing urbanization exist objectively. The fact that the central government plans to complete 6 million units of affordable housing in 2013 has created a big boost for the elevator market that will continue.

EWI: As the international market continues to decline, global elevator giants will, predictably, continue to expand in China to increase their influence and market share. How does NBSL approach this?

GL: The global elevator giants have employed multiple strategies to respond to market differentiation, i.e., offer-

ing premium/medium/basic product lines, introducing Lean manufacturing and utilizing global procurement and supply-chain management to continuously reduce operation costs and improve performance-to-cost ratio to achieve business expansion in China. NBSL constantly develops diverse elevator components and solutions to meet these multilevel needs of elevator companies. For example, the economy-type door system developed for the affordable housing market is especially popular.

EWI: Do you think the structure of the Chinese elevator industry is changing? If so, how?

GL: From the perspective of geographical distribution, as the country's central and western development has intensified, the Chinese elevator industry is gradually moving from the traditional Yangtze and Pearl river delta regions to the central and western regions. In addition, the industry is shifting from foreign enterprises being the majority to having foreign and private enterprises coexist. From the perspective of market demand, it is now not only sales and installation of new elevators, but also modernization and maintenance.

EWI: Which factors are driving market competition? Which capacities do companies need to strengthen?

GL: First, national policy control; second, technical standards; third, international market demand. Enterprises need to strengthen strategic planning capacity and make timely judgments, because domestic and international markets change. They need to formulate corresponding development strategies and strengthen R&D capabilities. To keep new technology, they must realize new standards will be applied. They must strengthen production and operation management capabilities in order to continue to improve efficiency and quality. Finally, they must expand service capacity to improve customer satisfaction.

EWI: What is NBSL doing to remain sustainable in light of future changes in the market?

GL: In 2013, we set up NBSL Elevator Components Group, which includes our headquarters, R&D and marketing departments in a new Shanghai factory, and opened an operation in Ningbo at the same time. A new Shipu factory with 160,000 m^2 in the Shipu Technology Zone will be put into operation by the end of the year. To better serve increasing demand in China's middle, western and southern regions, the company is actively developing Chongqing and Guangzhou logistics centers. Upon completion, delivery time for clients in these regions will be significantly reduced. Internationally, the company plans to launch sales offices in India in an effort to further strengthen our cooperation with world-famous brands and local companies in India.

Raising the Bar: The Role of Consultants in the VT Industry

by Lerch Bates India

As we look at the rising skylines across India, at least in metropolises, the key change observed over the past decade is that buildings are growing taller. As a result, the Indian vertical-transportation (VT) industry has shown consistent, steady upward growth. No doubt this growth is also driven by economic growth, which the country has witnessed during the same timeframe. It is also evident from the increasing number of new sophisticated and expensive construction developments.

Yet, how often has one entered a building -- be it an office block, a residential tower, a mall or a multilevel hospital -- only to face long queues waiting for lift service in the main entrance lobby? Sometimes, these queues even extend outside the building. Ultimately, one reaches one's destination floor after a long, frustrating wait, and possibly an uncomfortable ride in a cramped, stuffy lift cabin with inadequate ventilation, jerks, vibrations and noisy doors. At the end of such a trip, one may even have to push oneself out of the car! Do comments such as "horrible lifts in that building" not sound familiar?

We have all come across situations almost identical to the one cited above in many buildings, some of which were built many decades ago, where the building was inadequately elevatored, resulting in occupants and visitors experiencing poor lift-service quality. As more Indians travel overseas and witness the lift performance outside our country, as consultants, we at Lerch Bates India often get asked by laypersons why it is not possible to have lifts like those operating overseas here in India.

One comes across different types of VT equipment in multistory buildings, prompting the inevitable question, "Is this building correctly elevatored with an adequate number and correct type of lifts?" With VT equipment being the lifeline of any tall building, it is imperative to provide the optimum number of lifts in terms of capacity and speed, as well as for firefighting and evacuation purposes. Safety of the building occupants is paramount, and it becomes vital to ensure that users fully understand safety evacuation procedures. It is also imperative that fire lifts comply fully with code requirements. We firmly believe the safety of building occupants is nonnegotiable under any circumstances.

In developed countries, it is an accepted practice for developers, architects and general contractors to utilize the services of a lift consultant when embarking on a building project, just like is done by other key disciplines. As consultants are (normally senior) professionals who are very experienced in their respective fields, they impart specialization and add value to a project. Today, almost all reputable architects will insist on engaging the services of a VT consultant.

We have often heard that lift requirements for a building can be left to architects. As buildings get taller, they tend to become more complex, both in terms of design and end usage. Hence, it is ultimately in end users' best interests to engage an elevator consultant at the concept stage, so that the elevator system is both user friendly and cost effective. There are several known instances where the VT consultant has helped the architect comprehend the Indian Standards. Meanwhile, the consultant works as a "bridge" between architects and code implementation authorities.

> An initial design mistake can result in jeopardizing the investment in a building project for its entire lifetime.

Elevator companies tend to "push" their respective products and services, which is their rightful role in business. They also bring their latest technologies to suit various customer needs. VT consultants' role is to select the best technologies for each building's needs. But, this being a specialized industry, not everyone clearly understands its intricacies and complexities. So, how does one assess which product is best suited to one's needs? This is where a VT consultant helps -- in providing solutions based on a knowledge of globally available technologies.

A consultant in a building project plays the role of a doctor or lawyer, offering guidance based on expertise and experience. The consultant's role is to provide the most genuine advice in an open, fair and transparent manner. In other words, the consultant adds value at every stage of the building development and construction project. This may involve designing and recommending the best lift system appropriate to the building's needs in terms of space requirements, particularly where land is costly. It may also include advising on costs so that owners later realize overall significant savings. An initial design mistake can result in jeopardizing the investment in a building

Continued

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project for its entire lifetime. Consultants also provide a nonbiased professional opinion on the VT system, working against a vendor's "push." There are several documented cases where VT consultants have reworked VT designs based on their knowledge and experience, which has helped reduce the amount of equipment needed, thus saving developer costs.

Consultants specialize in lift technical specifications. This enhances options of a transparent process, allowing the maximum number of bidders and leveraging the consultants' experience and expertise to obtain the best possible technical specifications, prices and commercial terms. The owner has the further advantage of no longer having to review each vendor's bid and try to make a direct comparison.

Project-management skills in the execution phase ensures the installation happens on time and that the correct tools and work processes are used. There are also ongoing process installation audits intended to eliminate poor-quality workmanship and noncompliant equipment being used in the project -- i.e., ensuring specifications are met.

VT consultants have also been gainfully used when older buildings wish to upgrade their lifts. The consultants' expertise can bring about a major VT-system performance improvement upfront, clearly highlighting differences and expectations from an upgrade to an existing system, versus fully replacing it with a new product (often at a cheaper cost). Very often, it is possible to install a larger-capacity elevator with a higher speed in the same hoistway, thus giving building users improvement in lift service. The consultant also warns of issues the building residents may encounter once the work is in progress. The consultant will keep in mind that such work is taking place in a "living" building, where residents are constrained to face the inconvenience and disruption in daily living, while lifts are being upgraded or replaced.

There are several documented cases where VT consultants have reworked VT designs based on their knowledge and experience, which has helped reduce the amount of equipment needed, thus saving developer costs.

VT consultants also play a major role in monitoring maintenance quality. This comes in the form of reviewing safety aspects by conducting independent audits of the equipment and providing energy saving/green suggestions, apart from working to ensure the VT system's qualitative aspects meet user expectations. Consultants can also assist in the pricing of the maintenance contract. In addition, they have a role to play in educating lift users and being part of code committees to raise the bar on existing codes, primarily for safety aspects. This helps the user feel more secure, and equipment quality and standards are improved. The consultant becomes the customer's voice in such forums.

Consultants also play a role in making the market more competitive by assisting new VT vendors in establishing their operations in the country by making them aware of local code requirements and related aspects of the business environment. This aid can continue until the incumbent vendor establishes an office in the country and becomes another vendor in a more competitive market, which ultimately benefits users.

VT vendors maintain close contact with VT consultants and periodically update them about their new product developments and features, besides showcasing their products to them in running buildings. A genuine VT consultant will always act in an ethical manner, by maintaining an open, transparent and arm's-length relationship with all prospective vendors, such that any possibility of bias is eliminated. Time has shown that VT consultants' fees can be recovered many times over via the cost savings and value additions they impart to a project.

To conclude, engaging a VT consultant's services has multifold benefits, including value and cost benefits. Above all, it provides a qualified expert on the project team. Ultimately, a professional VT consultant works at raising the bar in terms of product and service standards, benefitting developers, architects, the industry and the end user.

The Lerch Bates India team

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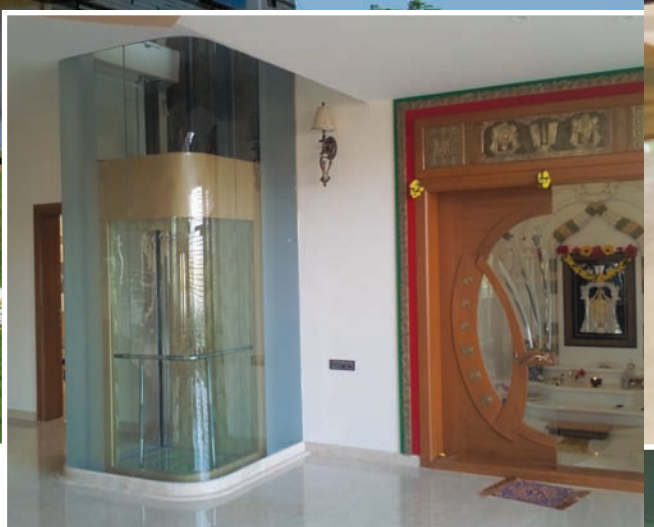

photos by Ascent Lifts and Escalators Pvt. Ltd.

Home Elevators Redefine Luxury Living:

Moris Italia and Monteferro India Build Niche

by B.S. Kumaraswamy

Thanks to a growing middle class with more disposable income and an expanding population of upwardly mobile young professionals and high-net-worth individuals who want homes that reflect their financial and social status, the market for designer residences in India is seeing remarkable growth. Luxury living is being redefined, and state-of-the-art personal elevators with unique architectural design, custom aesthetics and utility are in high demand. A partnership between Moris Italia and Monteferro India has answered this demand by delivering high-end, customized personal elevators to multimillion-dollar homes across India since 2011. Through Monteferro, Moris has supplied such hydraulic components as pistons, power packs, buffers, car frames, accessories and guide rails to approximately 200 passenger and 300 freight elevator installations in the country. The range of home lift and freight elevator pistons provided by Moris Italia include:

Continued

A technical workshop underway in Mumbai (photo courtesy of Escon Elevators Pvt. Ltd.)

With every high-quality element carefuly chosen, elevators have become a lifestyle statement for luxurious living.

- Rod diameters for single-stage pistons from 50 to 280 mm, with various thicknesses in one or more sections; the maximum length of each section is 11 m.
- Indirect (roped), direct side, or central underground acting pistons
- Telescopic pistons (side acting or underground) of two, three and four stages
- Rupture valves with flow of up to 650 l/min.
- Chrome-plated piston rods

The partnership blends the flexibility and desirability of Moris Italia's lift components with Monteferro's cold-drawn, machined, high-speed guide rails and shaft components. Such components are popular among elevator companies that focus on high-end residences -- a market distinct from high-rise commercial buildings – and, through the partnership, installations have been done by elevator companies in cities including Bangalore, Chennai, Mumbai, Hyderabad, New Delhi and Ahmedabad.

Offering privacy, space and amenities such as innovative technology, designer residences have immense investment value and offer a complete living experience. Air-conditioning systems, pools, hot tubs, home theaters, closed-circuit surveillance cameras, innovative construction materials and designer furniture are common. Elevators are becoming so, as well, with each having a unique style, while providing accessibility for the elderly and disabled. With every high-quality element carefully chosen, elevators have become a lifestyle statement for luxurious living.

Moris Italia's Deep Roots, Future-Thinking Investments

With a continuous focus on building international relationships, Moris Italia traces its roots to 1981 in Malgesso, Italy (a few kilometers north of Milan). Certification in accordance with UNI EN ISO 9001 international standards in

1996 paved the way for improved production, leading to the company's ability to offer complete hydraulic systems since 1997 and, since 2003, lifts with reduced pit and headroom. The company continues to make R&D a cornerstone of its growth and build its reputation in India. Production plants in Italy and Spain, meanwhile, allow immediate response to the world market, while fulfilling customers' demand for quality.

In 2008, Moris Italia built a new plant in Brebbia, Italy, including production facilities, office and storage areas. This enhanced the company's flexibility and speed of service. In 2012, Moris Italia further expanded its Brebbia operations with a new production facility incorporating eco-friendly features that:

- Reduce CO_2 emissions by 35% during production, thanks to more than 6,000 m^2 being covered by solar panels
- Use filtered rainwater for all production procedures calling for water
- Include a piston-painting cabin with active air filtering using water-based colors
- Include welding and grinding stations with active carbon filters
- Constantly perform chemical analysis on production waste, which is then disposed of by specialized companies

On Monteferro India's end, a sales team offers sales and after-sales service reinforced by technical experts at Moris Italia, who are available by phone or onsite. This is combined with the availability and swift delivery of original spare parts to ensure that installations with Moris hydraulics are correctly maintained in line with the specific needs of a new or existing building. In India, the high-end homes in which elevators are installed are typically in the range of US$1-4 million. As an added benefit to customers, Moris has planned a workshop for technical teams to gain theoretical and practical knowledge to help them effectively troubleshoot service issues.

Savino Tondo, general manager of Moris Italia, observes:

"The quality of the Moris product is assured by the final test of each single component. Customer service is our primary motivation. The great commercial success of Moris in India has supported the birth of a technical and commercial competence center in India capable of automatically managing local technical support by providing fast and complete answers to local installers."

B.S. Kumaraswamy is director of Monteferro India. He holds a Bachelor of Engineering degree from Bangalore University and a post-graduate degree in Marketing Management. He has approximately 25 years in the elevator industry and can be contacted at e-mail: kumar@monteferro.it.

Pressurizing the Cars of High-Speed Express Elevators

by Pieter J. de Groot

The possibility of pressurizing elevator cars in high-speed express elevators is often mentioned in articles about express elevators for tall buildings. "A New World's Fastest: Shanghai Tower" (ELEVATOR WORLD India, 3rd Quarter 2013) mentions the pressurizing of cars and provides an interesting project in consideration of this topic. The express elevators for this tower may have a maximum contract speed of 18 mps.

The article mentions that the double-deck express elevators will reach contract speed after an acceleration period of 25 s. and travel at full speed during 10 s. If we assume the deceleration period is also 25 s., the total travel time to floor 119 (a distance of 565.4 m) is 60 s. This time probably includes time for door operation. A calculation with the usual standard rates for acceleration, deceleration, jerk, and times for door closing and opening confirms that the 60 s. door-to-door flight time (DDFT) is correct for the assumed contract speed of 18 mps..

The air pressure at floor-level zero will fluctuate in accordance with weather conditions; however, the air pressure on floor 119 will be about 58 millibars less, because air pressure declines by about 10.2 millibars per 100 m.

Control of Air Pressure

The time available for a gradual reduction of car air pressure during an up trip is the DDFT of 60 s., minus the time for door closing and opening (i.e., 54 s.). This means the car internal air pressure must be reduced by 1.07 millibars per second (58/54). This mode of air-pressure control provides a car internal air pressure as if it is a non-pressurized car traveling at a constant speed of 10.5 mps. During down trips, the car air pressure must be increased by 1.07 millibars per second.

Passenger Comfort

Airlines have undoubtably investigated the effects of air pressure on passengers, because gradually reducing air pressure in cabins and increasing it before landings is a standard practice. Airplanes usually have plenty of time for this procedure. For elevator passengers, the question is, "Which rate of change of car air pressure is safe and comfortable?" The author is under the impression that car speeds up to 12 mps can be tolerated by elevator passengers. If this assumption is correct, the pressurizing of the Shanghai Tower elevator cars enables a reduction of DDFT. If the maximum elevator speed that can be tolerated by the general public is less than 12 mps, the pressurizing of elevator cars is probably not attractive, because it introduces a serious technical problem for minimal time benefits.

Complex Technical Problem

"A New World's Fastest: Shanghai Tower" mentions it may not be possible to use the maximum possible contract speed of 18 mps. This comment is not surprising, because the pressurizing of cars presents a complex technical problem that includes air-conditioning of the car interior. Also, a sudden change of air pressure due to a technical problem would have to be considered.

Continued

Pieter J. de Groot has many years of elevator contracting experience in Hong Kong and other cities in the Far East and Australia. In 1972, he was appointed Schindler area manager for the Asia-Pacific region. In this capacity, he initiated and managed the formation of Jardine Schindler (Far East) Holdings SA (1974) and Schindler Lifts (Australia) Pty. Ltd. (1980). After his retirement from Schindler, de Groot decided to conduct his own research concerning destination group controls to make the performance potential of groups transparent. In addition, he is the author of the book *The Planning and Performance of Groups of Elevators.*

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Conclusions

It is technically possible to realize a DDFT of 60 s. to the Shanghai Tower sky lobby. It would probably be the first group of express elevators that controls the internal air pressure of cars to minimize flight times. To put this DDFT of 60 s. into perspective, note that a contract speed of 12 mps will increase the DDFT to about 70 s. For a contract speed of 10 mps the DDFT will be approximately 73 s.

The round-trip times (RTTs) of the cars are positively affected by short DDFTs; however, the large cars of the express group under consideration cause long car loading and unloading times that negatively affect group performance. If we assume that the express group to floor 119 consists of four double-deck cars, their RTTs during heaviest simultaneous up and down traffic will be twice the DDFT of 60 s., plus two 25-s. periods for loading and unloading of, say, 20 passengers per deck at each terminal (i.e., a total RTT of 170 s.).

In this case, the theoretical minimum average departure interval will be 43 s., and the theoretical minimum average waiting time will be approximately 22 s. The maximum transport capacity of the group per 5 min. in both directions will be 282 passengers in both directions. The 25 s. for loading and unloading assumes the decks of the express cars have two sets of doors opposite each other to allow the loading doors to open about 5 s. after the opening of the unloading doors. This implies the 20-s. loading and unloading periods overlap by 15 s. If the decks have only one set of doors, the RTT will be at least 30 s. longer.

The four-large-car configuration is not the best possible optimum. An alternative group of six half-as-large triple-deck cars can be installed in the space required for four large double-deck cars. With a contract speed of 10 mps and unpressurized cars (with two sets of doors per deck), this group will deliver average RTTs of 171 s., plus 15 s. if having one set of doors. With two sets of doors, loading and unloading will take 12.5 s. per stop (25 s. for each round trip).The departure intervals will be approximately 29 s., and average waiting times will be approximately 15 s. The maximum capacity of this group per 5 min. will be 316 passengers in both directions.

The essential aspects of planning express groups and sky lobbies are described in Chapter 12 of your author's book, *The Planning and Performance of Groups of Elevators*, published at website: elevatorgroup controls.com. Within, a six-car configuration with small triple-deck cars to reduce crowding at the main entrance and sky lobby floors and substantially increase service frequencies is presented. The author will greatly appreciate comments or questions from readers through EW at e-mail: editorial@elevatorworld.com.

Africa Power-Supply Shortages Create Opportunities

by Shem Oirere

AU headquarters, Addis Ababa

Unexpected power outages in Africa have opened a new market for power-backup solution providers while making recent innovations by elevator makers, such as solar-powered units, more desirable. In an effort to keep elevators running even when electricity is interrupted, commercial and industrial building owners and managers are increasing project costs to include an alternative power supply. Three incidents illustrate how badly a remedy is needed for Africa's spotty power coverage.

On July 17, 2011, former U.S. Secretary of State Hillary Clinton, while addressing African heads of state and lawmakers gathered at the Chinese-built, 20-story African Union (AU) headquarters in Ethiopia's capital of Addis Ababa, had to cut her speech short and left the country after a massive blackout hit the 100-m-tall building, stalling elevators and paralyzing the sound-address systems for hours.[1] Almost two years later, on May 23, 2013, Clinton's successor, John Kerry, was set to address the AU summit during its 50th anniversary when he experienced a similar situation in its new headquarters building, built at a cost of $US200 million by China as a gift to the AU: an electricity blackout hit the structure, the tallest tower in Addis Ababa, which, at the time, had no reliable alternative power supply.[2] Like Clinton, Kerry left the country, cutting his visit short and canceling planned discussions with African leaders and foreign dignitaries.

Later, on September 4, Liberian President Ellen Johnson Sirleaf and her security chief became trapped in an elevator during the regional High Level Panel Meeting on Fragile States at one of the leading hotels in the Liberian capital of Monrovia.[3] The president's executive protection service director forcibly opened the

Continued

Shem Oirere is a freelance writer who covers construction, energy and general-infrastructure sectors in Africa. He is based in Nairobi, Kenya. He holds a diploma from the London School of Journalism. Over the past 16 years, he has covered news for such national papers in Kenya as *Kenya Times*, *The People*, *Weekly Review* and *Daily Nation*. As a freelance journalist, he has written for such publications as *World Highways*, *Engineering News Record*, *International Railway Journal*, *Windpower Monthly*, *Sun & Wind Energy*, *Water21*, *World Cement*, *Bridge & Design Engineering*, *Dredging and Port Construction*, *World Pumps and Water*, and *Waste Water International*.

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elevator door to get the president out before power was switched on minutes later.

Across the region, there are many similar, unreported incidents that illustrate the serious challenges industrial and commercial building owners face as electricity shortages persist across Africa. According to the International Renewable Energy Agency (IRENA), Africa has 147 GW of installed capacity, "a level comparable to the capacity China installs in one or two years." According to IRENA, "average, per-capita electricity consumption in sub-Saharan Africa (excluding South Africa) is just 153 kWh/year. This is one-fourth of the consumption in India and just 6% of the global average." Nearly 600 million people in Africa lack access to electricity, and blackouts occur almost daily.[4]

Power-distribution lines in Tanzania

Inge Hackenbroch, director Africa/Middle East at Germany Trade & Invest GmbH, notes that due to Africa's economic growth and rapidly increasing population, demand outstrips supply in many areas. As a result, individuals and businesses often fill power gaps by using expensive solutions, such as diesel power. This erodes the gross domestic product of some African economies by 1-5% each year.[4] To keep their facilities running, including vertical-transportation systems, many building owners and managers are buying power-backup systems, particularly diesel generators, Hackenbroch said. Petri Velikakoski, executive manager responsible for Africa business at MAN Diesel and Turbo in Augsburg, Germany, pointed out that new power stations are very expensive, and that few domestic construction companies are able to financially take on such large projects.

Elevator Companies Strive to Fill Gap

Diesel generators, however, are not the only answer to frequent power outages in buildings, including those in Africa. Elevator makers have also introduced solutions designed to help minimize the possibility of accidents or disruption of operation at either buildings or mines where vertical transportation is commonly used. For example, Otis said because diesel-powered generator sets have heavy architectural and financial impact on a building's management, it developed a new solution, the Gen2® Switch, an autonomous battery-powered elevator (ELEVATOR WORLD INDIA, 2nd Quarter 2013). "The cost of the project is reduced, because the elevator's self-contained machinery enables promoters to recover revenue-generating space," stated Marc Roussel, director of Otis Africa and New Equipment France.

Because it ensures an elevator's operation even during a power outage, Gen2 is an ideal solution to power-outage problems, Roussel said. The invention, he said, is the multi-source elevator, which operates with a single-phase, 220V main circuit and can also use renewable energy sources such as solar and wind to recharge its batteries. Roussel described the Gen2 Switch:

Marc Roussel, director of Otis Africa and New Equipment France

"Powered by its system of four batteries, the Gen2 Switch is the first step toward the autonomous elevator, unaffected by power outages and fluctuations in the electrical grid. If the building project is not equipped with solar panels or wind generation, our Gen2 Switch simply plugs into a single-phase 220V outlet."

Schindler Solar Elevator Raises Hope

Early this year, Schindler introduced a solution that relies on renewable energy, specifically solar (EW India, 2nd Quarter 2013). Analysts feel it could provide a stable power supply in regions such as Africa, where erratic supply has impacted the industrial and commercial building markets. The Schindler Solar Elevator was initially available in Europe and India and will be available in remaining markets such as Africa in 2014 (See p. 90, "Schindler Has High Hopes for New Solar Elevator"). That raises hope that solar energy could be part of the solution to Africa's energy problem. Furthermore, many buildings in Africa are

low rise, which is where the solar-powered elevators operate best.

Schindler states its Solar Elevator both reduces costs and increases operability, since it runs independently of the power grid. The system has many energy-efficient features, such as standby power mode and car lights that automatically switch off. Schindler President of Marketing and Sales Bill Fiacco said, "The Schindler Solar Elevator is a major step forward in creating net-zero energy buildings in urban environments."

Dinesh Musalekar, Avire Global's general manager for India, the Middle East and Africa and resident director for India, said frequent power failures such as those experienced in energy-starved African countries could hinder vertical transportation. Musalekar said:

> *"Frequent power failure has a very adverse effect on the elevator performance, causing frequent passenger entrapments [and] lifts being out of operation, from the service point of view. The sudden failure of supply and resumption of the same also causes the high surge of current, which is not desirable for the elevator controllers and other electronics of the elevators."*

Although infrequent, serious accidents can happen during rescues of trapped passengers – entrapments that could have been caused by a power outage, Musalekar said.

Roussel pointed out that without electrical power, a traditional elevator stops operating, making a building's upper levels inaccessible to people who cannot climb stairs due to reduced mobility. "In addition, repeated outages or voltage variations in the power circuit deteriorate an elevator's electronic components. The cost of maintaining the machines affected by these phenomena is increased," he said.

According to experts, Africa needs to increase investment in electricity generation by an estimated 250 GW by 2030 to keep pace with its economic growth. The additional generation, IRENA maintains, will mean capacity must double to approximately 7 GW a year in the near term, and quadruple by 2030. Roadblocks still exist, however:

> *"While access rates are improving in some countries, the business environment and policy framework are still not sufficiently robust to attract the level of private investment required to install the additional 250 GW by 2030. Many African countries are burdened by opaque policy frameworks and excessive red tape, while electricity subsidies and government-mandated pricing often hinder sustainable business investment."*[4]

Development Prospects Outweigh Concerns

Despite Africa's power-supply challenges, many vertical transportation firms plan to invest in the region, because future development looks bright. Otis, active in almost every African country, either through Otis companies or exclusive distributors, said it will use its South African subsidiary to expand operations in South Africa, Angola and Zambia. Roussel said:

> *"In eastern Africa, we have just created Otis Kenya, which will help us to deliver the best service to our customers. In northern Africa, despite the events, we continue our operations and continue to serve our customers, with Algeria today becoming a fast-developing country with its landmark project the Great Mosque. Otis does believe in the development of Africa and we are investing more and more in developing technical skills."*

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[2] *Ethiopia News Forum*; May 26, 2013.

[3] *The New Dawn* (Monrovia); September 4, 2013.

[4] International Renewable Energy Agency (www.irena.org).


אזהרה

Aish HaTorah

Elevator Installation in Jerusalem

by Oren Meitus

The Jewish Quarter in Jerusalem is home to religious institutes and residential complexes. The first building overlooking the Western Wall is the Aish HaTorah World Center, a Jewish learning organization with branches in 35 cities around the world. Aish HaTorah was renovated to preserve its long history in Jerusalem. The structure is built into the rocks and rises seven stories above the Western Wall Plaza.

Due to its cultural importance, each balcony and window in the Jewish Quarter strives to provide a view of the Western Wall and Temple Mount (another religious site). Therefore, Aish HaTorah committed to the municipality and neighbors not to have any structure on its roof, apart from the transparent railings and replica of the Jewish temple.

The Aish HaTorah organization wanted to arrange events on the roof of the building, and required an elevator to travel directly to and from the rooftop, while leaving the roof floor level without any obtruding structure. The challenge was to design an elevator unique to its surroundings, while creating a discrete structure that blended in with the landscape around it. Aish HaTora selected ESL – Eng. S. – Lustig Consulting Engineers Ltd., an Israeli vertical-transportation consulting firm, to design the technically challenging elevator.

David De Mayo served as architect for the building's redesign, and Buki Zuker served as both designer and architect. For the detailed design and execution, Electra Elevators, a member of the Electra Ltd. group and one of the

Continued

Photos

Opposite page: Elevator on the building's rooftop

Bottom left: Elevator machine room

Bottom right: Inside the elevator shaft at the roof level

Aish HaTorah

Continued

largest elevator companies in Israel, was chosen. The Israel Standard Institute was nominated by Electra Elevators for the approval of all required safety systems. An elaborate risk analysis was conducted, due to the elevator's unique roof landing, which features a relatively low glass railing.

Elevator Specifications

The elevator can transport up to 13 passengers at a speed of 1 mps, serving eight landings with a traveling height of 28.3 m. It is a traction-drive elevator, with its machine room below to the side, and features 2:1 underslung roping and variable-frequency motion control.

Since the car is not guided on the roof, the car frame was elongated in its lower part in order to guide the car on the guide rails to the level just below the roof. The counterweight is short (1.2 m) due to the limited traveling distance.

When the elevator travels to the roof, it lifts a 250-kg canopy. The canopy is solid enough to enable standing on it if someone crosses the low railing on the roof. The cover closes the shaft and protects it from water penetration, and includes required special solutions for drainage and sealing.

Since the elevator is relatively quick, its interface with the roof is controlled and carried out in a low speed setting. Small columns with strong electromagnets at their tips were installed on the four corners of the car's roof. When the car meets the roof, the columns enter special sockets: the electromagnets are activated and strongly attach the canopy to the car, avoiding movement. Below the car, there is a maintenance platform with the service control box and junction boxes, as well as the air-conditioning unit for the car.

For security, a camera was installed on the building's roof to monitor the elevator's environs from a screen inside the car and make sure there are no obstacles or persons blocking the ascent of the canopy. The signal from the camera is transferred to the car by an Internet Protocol through the electrical system of the building. In addition, volume detectors are installed on the roof along the railings around the landing of the elevator to immediately stop it in case of danger.

Photos

Opposite page left: Transparent car-operating panel

Opposite page right: A view into the elevator cabin

Left: Opaque car-operating panel

Below: Aish HaTorah

The elevator's shaft door on the roof is a swing door type made of stainless steel up to the railing height and of glass in its upper part. The door's opening and closing mechanism is of special design and has drainage arrangements in order to avoid penetration of water into the shaft.

The elevator is also equipped with a weighing device for overload. When the elevator lifts the movable canopy, an automatic correction is made so the overload is relevant to the load inside the car. When the car leaves the roof and lowers the canopy to its initial position, the process is reversed. An ultrasonic position system designed by German company Schmersal was incorporated for the positioning and signals.

The car walls are made of liquid-crystal glass. When the cabin is in the closed shaft inside the building, the glass is translucent. When the cabin reaches the roof level, the glass is signaled to turn transparent, providing passengers a scenic view.

The air-conditioning of the car is in closed circuit, and air is pushed into and pumped out of the car. The air flows through hollow panels inside the cabin walls, with cold air blowing through the panels' upper part and hot air through its lower part. The elevator also features an automatic rescue system supplied by an uninterruptible power supply. The rescue is controlled by the inverter, and during emergencies, the elevator stops at the nearest floor and opens the doors.

Oren Meitus

is general manager of Electra Elevators, a member of Electra Ltd. He is an elevator safety engineer and is certified by the Israel Ministry of Labor. In addition, Meitus is a member of several standards committees for elevators at the Israel Standard Institute. He has a BSc in Mechnical Engineering and an MSc in Industrial Management, both from the Israel Institute of Technology in Haifa, Israel.

UCM++

FSSG Keeps UCM Protection Active Despite Door-Lock Bypassing

by Yoram Madar

Yoram Madar currently serves as an engineer for Rolls Elevator, which he founded in 1975. His experience has been concentrated on elevators in existing buildings. In 1983, he designed one of the first microprocessor elevator controllers. In addition, he received a patent for his RCE product for reduced-clearance elevators and the FSSG product for protection against the shortcut of safety circuits. Madar is engaged in the development of other elevator safety patents. He can be contacted at e-mail: rolls102@gmail.com.

During my 40-some years in the elevator business, I've learned one thing for sure: the number of problems elevator mechanics encounter during their work is not infinite and can and should be defined, as well as the procedure of how to address each of these problems in a safe manner. Just like any other maintenance work involving safety, elevator maintenance depends solely on elevator mechanics' professional integrity. In most cases, one cannot inspect the work elevator mechanics do in real time; one must completely trust their judgment, assume they are well trained, can be trusted and are not reckless.

In most cases, elevator maintenance reliability is based on self control, rather than dual control. There isn't a second eye to inspect work done upon completion of it, such as with car maintenance, where quality-assurance inspectors rate the work and its quality. This leads to the conclusion that elevator mechanics carry a position of trust, together with a great deal of responsibility, despite not always being well compensated for it.

Some elevator mechanics' duties require overriding safeties, such as bypassing door locks, which creates the potential for accidents, especially when a mechanic works alone. While there is no doubt a team of elevator mechanics is much safer than a lone worker, sometimes elevator work requires a single technician.

The real problem is that not all elevator mechanics are well trained in performing override actions safely. For example, I asked my professional group on LinkedIn, "What might be the best and safest way for an elevator mechanic to reach the car top when encountering a faulty door lock?" I have been amazed with the comments I got from various members answering this question. Some claimed such a question must be removed, as it might give some dangerous ideas. This kind of answer led me to the sad conclusion that some members of even professional groups don't have a clue about how to perform such basic actions safely. I also got the impression that actions involving a door-lock bypass are not to be mentioned in public.

On one hand, we cannot ensure that every elevator mechanic sent on a mission has the right knowledge, patience and mood for each fault he or she may encounter. On the other hand, since it might be a high-priced error, we need to provide the technician with protection(s) against all known possible errors – in other words, to protect the mechanic from his or her own mistakes.

I'm sure we all agree that an elevator running automatically under "Normal" control mode with an open door is *the* dangerous situation in our business, having recently caused horrific accidents. It is the aim of this article to present a new method of how to prevent this kind of accident.

The unintended-car-movement (UCM) protection, combined with my Fail-Safe Safety Guard (FSSG) device, creates a system, UCM++, that protects a modern elevator from running with open doors as a result of a faulty motor brake, together with door locks bypassed, while it is under "Normal" operation mode. At the same time, the system allows running under "Inspection/service" mode to safely implement maintenance, inspection and installation.

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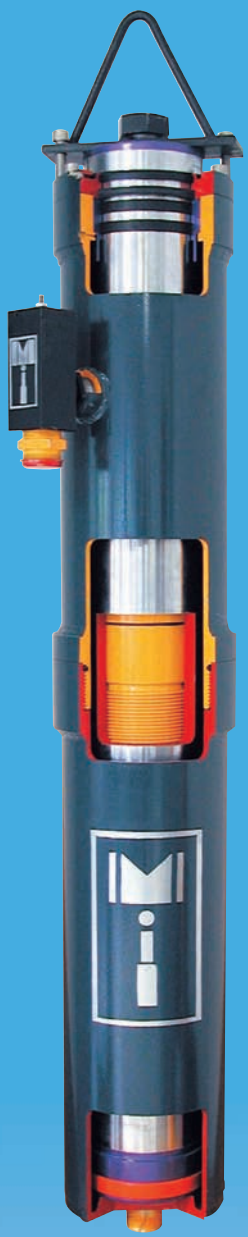

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Nowadays, new elevators are equipped with bidirectional safety gears, as well as the UCM protection. These devices' main objective is to prevent car movement with open doors that may result from a faulty drive unit, machine-coupling breakage, machine-shaft breakage, machine-brake failure or suspension failure. Such failures allow an uncontrolled rotation of the traction sheave/wheel. Together with accelerating car movement in either direction, horrific accidents to people entering or exiting the car may occur while the doors are open.

If any of the above failures occur, the safety gear is to be activated by the UCM protector to hold/clamp the car on its guide rails. Safety-gear activation is achieved by activation of the overspeed governor, which is triggered by an electric solenoid installed on it. Per code requirements, the solenoid signal is output by the controller as a decision whether to activate the UCM protector.

The design of UCM protector activation, in accordance with the rules that apply to the hoist machine, intends that if the machine is permitted to run, the UCM protector is disabled, allowing car movement. Otherwise, the UCM protector is to remain active to prevent car movement – for example, as a result of brake failure in which the brake remains partially open/closed, although the machine motor comes to rest. Especially with gearless machines, this allows instant car movement, even when a relatively small capacity (such as that of one person) enters the car. With the UCM protector operational, this hazard is avoided, simply because the car cannot move under that circumstance. The UCM protector will act in the same way in the case of suspension failure to prevent free fall of the car with its doors open.

I have concluded that the car moving with its doors open allows us to take immediate action to activate the emergency stop of the overspeed governor, instead of waiting until the car gains enough speed to activate it the conventional way, which would also require the absorption of an unpleasant stop in the realm of 1.2 g. There is no doubt the UCM protector is an excellent solution to the problems described above, and it has doubtlessly prevented an unknown number of elevator accidents. It is now incorporated into the EN 81 code as an essential preventive device.

The Problem with the UCM Protector

The only case in which the UCM protector cannot protect passengers involves the bypassing of door locks or the car gate switch. The code requires:

2.19.2 Unintended Car Movement Protection

2.19.2.1 Purpose.

Protection shall be provided with a means to detect unintended car movement (see 1.3) and stop the car movement, as a result of failure in any of the following:

(a) electric driving-machine motor, brake, coupling, shaft, or gearing

(b) control system

(c) any other component upon which intended car movement depends, except suspension means and drive sheave of the traction machine

2.19.2.2 Where Required and Function. All electric traction elevators shall be provided with a means (see 2.26.2.30) that shall

(a) detect unintended car movement in either direction away from the landing with the hoistway door not in the locked position and the car door or gate not in the closed position.

"(b) control system" is for UCM protector activation while the doors are not in the locked position. Until now, door-lock bypass has not been considered by the elevator controller as "control system failure." Instead, it considers the doors closed and locked; therefore, car movement is allowed with open doors. In such a case, UCM is disabled. Before the appearance of the FSSG, there was no way for the controller and UCM protector to distinguish whether the door-lock circuit was bypassed. However, the FSSG enables this.

Door-lock bypass may either be intentional (by the elevator mechanic to accomplish his or her duties) or unintentional (as a result of a short circuit such as a grounded phase single-ground occurrence). For either case, the door-lock circuit is bypassed, and UCM is disabled. Thus, the car is allowed to move with open doors, while still under "Normal" operation.

Though I suggested in my previous article to switch the elevator controller into inspection mode whenever a bypass is detected with an FSSG installed, it later occurred to me that this is sometimes not enough and does not provide the right solution/protection, nor satisfy the safety requirements. This is because the elevator may experience a combination of both door-lock bypass together with another mechanical failure (such as machine-brake failure). In such a case, switching the elevator to "Inspection" does not and will not prevent the car from uncontrolled running with an open door unless the UCM protector is operative. Therefore, the UCM protector must be kept in operation and not be disabled under any circumstances. This is particularly true when the door-lock circuit is bypassed.

The UCM++ Solution

In the event of the car moving with an open door as a result of suspension failure, shaft or coupling breakage, or machine-brake failure, instant UCM protector activation is required without any complication. My solution refers to the situation where door-lock bypass is involved. This process actually creates a mask that hides the true status of the doors' position from the controller. It is a way to deceive the controller and allow the elevator to run under a false assumption that the doors are closed and secure.

UCM++ utilizes the FSSG not only as a bypass detection device, but also to distinguish between elevator runs on a closed door-lock circuit or when that circuit is bypassed. At that time, I thought it might be useful for informing the elevator mechanic about the door-lock circuit status, although bypass existed, thus saving him or her the time of looking for the faulty door lock. But this was the least I could do with it, bearing in mind that whenever the elevator runs on bypass, it means that it runs with open doors, and that the bypass doesn't have any effect when the door-lock circuit is closed.

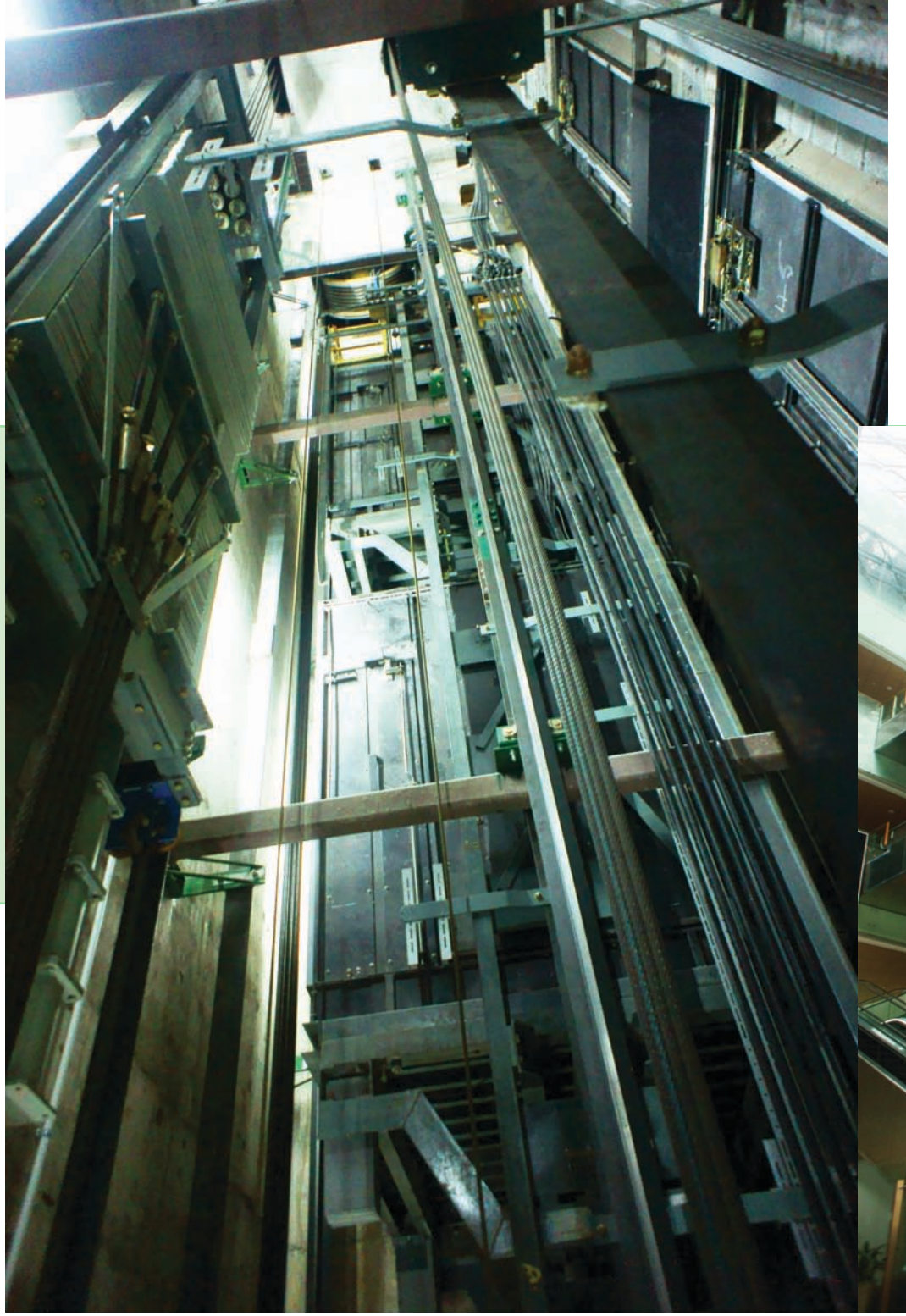
This led me to conclude that since the FSSG has the ability to detect bypass although the door-lock circuit exists, the FSSG has the ability to distinguish between both cases. Contrary to the former situation (with the FSSG on), one cannot deceive the elevator controller letting the elevator run under a false assumption that the doors are closed and locked. This allows integration of the UCM protector with the FSSG (UCM + FSSG = UCM++) to accomplish the main goal, preventing car movement in "Normal" mode, while door locks are bypassed and failure occurs. This has been implemented by connecting a normally closed (N/C) or normally open contact in series with the overspeed governor's activation solenoid: the contact status is controlled by the FSSG, which makes the decision whether to allow car movement according to the rule of bypass, such that if bypass is detected, the FSSG will disconnect the solenoid, thus triggering or activating the governor when the elevator starts moving with open doors. However, the decision made by the FSSG is independent from the decision made by the elevator controller. The decisions are not contradicted; the elevator controller makes the right decision, which complies to the rule of the elevator main motor. As for the FSSG, it acts in accordance with the rule for when bypass exists. This means the controller acts as if doors are locked, but the FSSG keeps it from being deceived.

The solution for how to allow the elevator mechanic to run the elevator under inspection mode during bypass with an operative UCM was quite simple. I used the common push button in the inspection station to override the N/C contact to the overspeed governor, thus allowing the controller to trigger the governor's solenoid, thus allowing the car to move with an open door, but only under inspection mode.

The solution described above makes the following statement valid: "This elevator will never be able to run with open door under 'Normal' operation mode." UCM++ is patent protected.

Bitexco Financial Tower

by Yeonsik (Victor) Kim



Double-deck elevator hoistway

Yeonsik (Victor) Kim works for Otis Elevator Korea. Kim began his career in 1984 at LG Electronics, where he gained experience in both domestic and overseas marketing. When Otis and LG joined forces in 1999, Kim played a key role in the early stages of the joint venture as the Otis LG marketing director. In 2005, Kim became responsible for Otis Korea Sigma's export business. In 2008, he led Sigma SEA/Hong Kong and Otis Vietnam to expansion. Kim has a bachelor's degree from Dong-A University in Korea and an MBA from the University of Washington.

The Bitexco Financial Tower is a 68-story commercial building in Ho Chi Minh City's District 1 (ELEVATOR WORLD, June 2010). Among the country's tallest buildings, the tower has transformed Vietnam's skyline and is a symbol of the momentum and aspirations of its people. Providing 37,000 m^2 of office space and 8,000 m^2 of retail space, upon completion, the tower also featured Vietnam's first helipad, which sits atop the building and resembles a blossoming lotus bud. On the 49th floor, the observation deck provides visitors with a panoramic view of the city and nearby Saigon River.

According to developer Bitexco Group's chairman Vu Quang Hoi, the group wanted a building design that would embody the country's dynamism and culture, similar to the way the Empire State Building is intertwined with New York City's (NYC) culture. Per Hoi's design request, architect Carlos Zapata of NYC, used the lotus, a Vietnamese symbol that represents purity, commitment and optimism for the future, to create an architectural form combining art with glass, steel and concrete.

Escalators inside the Bitexco tower

Bitexco Financial Tower in Ho Chi Minh City

Bitexco assembled an experienced international development team with a strong record of constructing tall buildings around the world. The team included contractor Hyundai Engineering and Construction of South Korea, and project manager Turner International, LLC of New York.

Vertical Transportation

As with any project of this size, the elevator installations presented challenges. The relatively small 5,312-m^2 site was surrounded by narrow, densely populated streets. Storage of building materials at the site also proved difficult. Otis was selected to provide 21 elevators and 10 escalators for the project. Twelve of the elevators are double-deck, high-speed elevators, all of which feature Otis' Compass™ Destination Management system. Fourteen of the building's elevators feature Otis' energy-efficient ReGen™ drives, which can reduce energy consumption by up to 70%. This is among the first projects in the world combining Otis' Compass system with double-deck elevators, creating a unique and efficient experience for building tenants and visitors.

The double-deck elevators shuttle passengers to the top of the building at speeds between 5-7 mps with capacities up to 3600 kg. The elevators were selected as a space-saving solution, as they serve two floors simultaneously using the same hoistway. The design allows for more passengers to be served compared to a single-deck, single-hoistway configuration. Depending on the building and its needs, double-deck elevators can save up to 40% of the space required by traditional elevators, while increasing transportation capacity up to 30%.

With the Compass system, instead of pressing traditional up or down buttons, passengers enter their destination floors using keypads or interactive touchscreens before boarding the elevator. The system immediately assigns passengers traveling to the same or nearby floors to

Continued

Bitexco Financial Tower

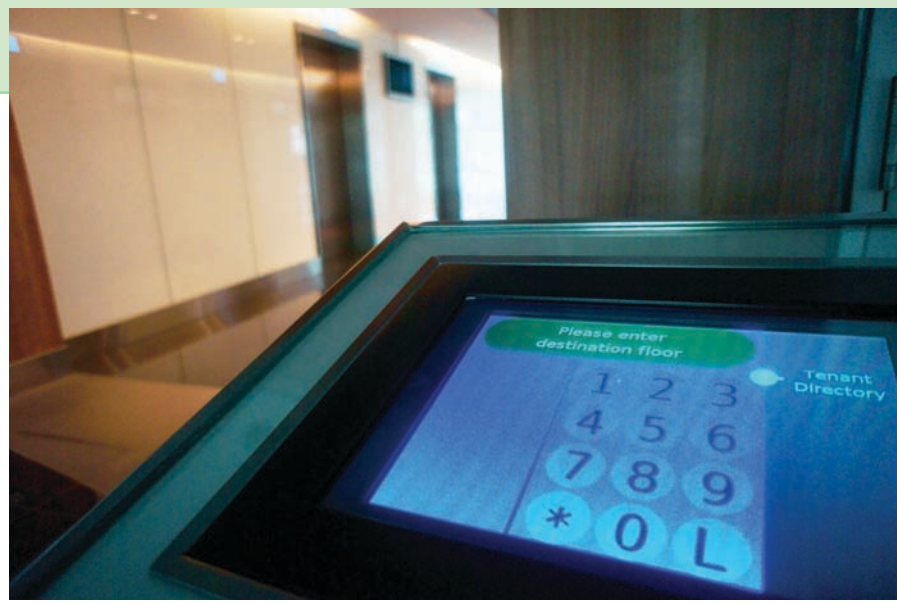
Continued

the same elevator, reducing wait and travel times and improving the flow of building traffic.

The Bitexco Financial Tower was also equipped with Otis' EMS Panorama™ system, a web-based application that enables building staff to monitor, control, report on and manage a range of elevator functions from any computer with an Internet connection. With this system, building staff can monitor elevator performance, security, traffic patterns, key equipment events, etc.

Vietnam is undergoing a historic transition from a primarily rural economy to an urban economy. "In emerging cities like Ho Chi Minh City, elevators are a critical part of ensuring efficient transportation in skyscrapers and optimal accessibility for all users," said Charles Vo, president of Otis' North Asia Pacific Area. "We are honored to [have been] a partner in this prestigious project and [to have] provided the elevators and escalators to this landmark building in Vietnam."

Vietnam has great significance to Otis. In 1929, the first Otis elevator was installed in the Presidential Palace in Hanoi. And, in 1993, Otis was among the first elevator companies and second international company to re-enter the country after the U.S. trade embargo was lifted. In 2006, Otis installed Vietnam's first moving walkways at the "Big C" Thang Long Supermarket in Hanoi.



Compass Destination Management system

Elevator lobby in the Bitexco tower

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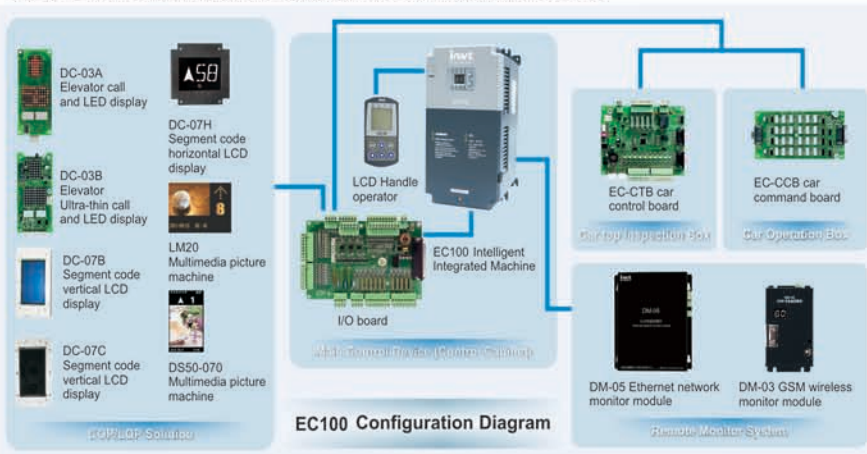

EC100 Configuration Diagram

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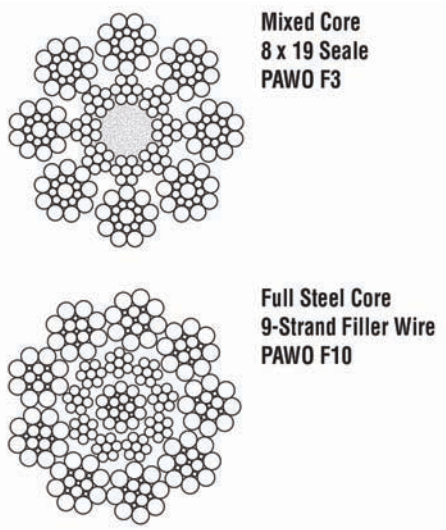
Selecting the Correct Rope for High-Rise/ High-Speed Elevator Applications

by Richard L. Lindemeyer and Dr.-Ing. Andreas Franz

When choosing a wire rope for high-rise/high-speed applications, it is essential to find a rope that combines high-speed performance with features that deliver long-term cost savings, while reducing service interruptions. Traditionally, traction and extra-high-strength (EHS) traction-grade ropes with natural fiber cores were employed for these elevators in North America.

However, improved rope designs that provide many benefits over natural fiber core ropes (especially in the area of longer service life) are now available. Other characteristics that contribute to a longer-lasting rope are its construction, wire tensile strength, resistance to fatigue, increased flexibility and resistance to cross-section deformation.

Table 1 compares traditional natural fiber core ropes with alternative constructions. A quick examination shows natural fiber core ropes offer the advantages of lower weight and acceptable values for breaking force and abrasion resistance. However, they are not strong performers in other important areas, which leads to greater elongation, lower resistance to fatigue (because of wire breaks due to bending) and increased cross-section deformation. These weaknesses result in higher long-term costs and unfavorable service life.



Rope cross-sections

However, these newer rope designs, such as 8 X 19 construction with a mixed core using steel reinforcement of a natural fiber core and nine-strand construction with full-steel core (also called an independent wire-rope core [IWRC]) offer many advantages over natural fiber core ropes, including higher breaking force, reduced elongation, increased resistance to fatigue and less cross-section deformation. These values indicate a measurable longer service life.

Note also that the nine-strand IWRC rope offers greater flexibility and a rounder rope cross-section. If it is determined that extra-high-strength traction grade is the right choice, a rope like Gustav Wolf's PAWO F3 (mixed core) or PAWO F10 (nine-strand IWRC) can usually be substituted for a natural fiber core rope. PAWO F10 also offers excellent resistance to elongation. However, the additional weight of a mixed core or full-steel core rope should first be analyzed to ensure that it does not exceed the equipment design criteria.

Re-roping a high-rise/high-speed installation can present some special

Continued

	Construction	Outer Wire Tensile Strength N/mm²	Breaking Force	Relative Elongation	Abrasion Resistance	Fatigue Resistance	Flexibility	Cross-Section Deformation	Cross-Section Roundness	Relative Weight	Service Life
Natural Fiber Core (Traction Grade)	8x19 Seale	1180 (Soft)	Med	High	Med	Low	Low	High	Low	Low	Low-Med
Natural Fiber Core (EHS Traction Grade)	8x19 Seale	1670 (Hard)	Med-High	High	High	Low	Low	High	Low	Low	Low-Med
Mixed Core	8x19 Seale	1570 (Med-Hard)	Med-High	Med	High	Med	Low	Low	Med	Med	Med-High
Full Steel Core (IWRC)	9-Strand Filler Wire	1570 (Med-Hard)	High	Low	High	High	High	Low	High	High	High
Synthetic Fiber Core	8x19 Warrington	1570 (Med-Hard)	High	Med	High	High	Very High	Med	Med	Low	High

Table 1

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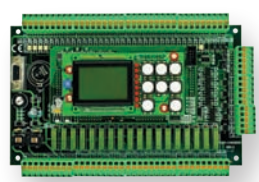

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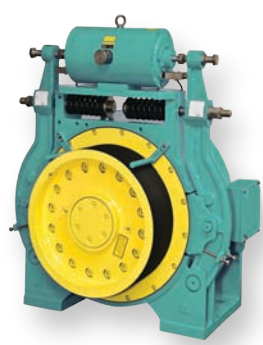

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challenges. For instance, the sheaves must be carefully checked, and re-grooved or replaced as necessary. This is because the diameter of the new ropes is greater than that of the old ropes. Failure to bring the sheave grooves into the machine manufacturer's specified tolerances can lead to vibration, metal shavings and other problems.

Along with taking new-rope diameter into account, care must always be taken to ensure the hardness of the machine sheaves and the grade/tensile strength of the rope are compatible. Sheaves designed for a traction-grade rope may not be hard enough to accommodate EHS traction-grade ropes, and sheave damage could result. Sheave hardness can be confirmed by using a hardness tester. Sometimes the hardness is stamped directly on the sheave. Sheave damage can be avoided by verifying the rope grade/tensile strength. If this information is unavailable, knowing the breaking force can help confirm the grade/tensile strength of the rope. Breaking force is usually indicated on the crosshead data plate. For example, if a breaking load of 17,500 lb. • 77,800 N is indicated for 1/2-in. • 12.7-mm 8 X 19 ropes, referencing the manufacturer's catalog, data sheets or website will indicate this rope is an EHS traction-grade rope. It is important to be aware that if the original elevator machine has been replaced, the crosshead data plate may not be a reliable source of information. Also, the old rope tag may have inaccurate information on rope grade and breaking force.

The synthetic fiber (non-sisal) core rope mentioned in Table 1 is Gustav Wolf's latest innovation, HyTrac™. It combines a high-strength synthetic core with steel wires in the outer strands. When compared to steel core ropes, the weight is 20% less, the bending performance is up to 50% higher, and the breaking force is equal. In comparison to ropes with a natural fiber core, the breaking force is higher still, at around 50% .

When pricing ropes designed for high-rise/high-speed elevators, a very important factor to consider is the cost of the rope – not just the purchase price, but the long-term costs. Most rope replacement is performed under a maintenance contract with a flat fee. Excessive service calls for rope shortening not only cut into a company's profits, they also create a dissatisfied customer when elevators are out of service for work that would be unnecessary had rope with less elongation and a longer service life been installed. Installing a higher-performance mixed core (PAWO F3) or nine-strand steel core (PAWO F10) rope is definitely in a company's financial interest.

It is important to note that while certain designs offer inherently longer service life, it is essential that all hoist ropes be treated to a regular program of rope tensioning and lubrication. (Governor ropes should never be re-lubricated.) Rope tensioning can be performed with a Micelect® rope-tensioning system (RTS). An RTS allows a single technician to quickly and accurately equalize the tension of up to 12 ropes. A rope treatment/lubricant such as DrakaLube® helps mitigate the bending stress and high groove pressures found in high-rise/high-speed applications. A newly introduced automatic rope oiler, the Draka Accu-lube™, provides automatic, consistent and continuous lubrication for these ropes. The Gustav Wolf catalog download mentioned above also contains suggestions for a regular maintenance regimen.

In conclusion, installing mixed core (such as PAWO F3 8x19 Seale) or full-steel core (like PAWO F10 nine-strand Filler Wire) rope on high-rise/high-speed elevator re-roping or new-installation projects is to the advantage of both contractors and their customers.

Richard L. Lindemeyer has been employed at Gustav Wolf Steel Wire & Steel Wire Ropes in the position of general manager for North America since the inception of the company in 2007. Lindemeyer has worked in the elevator industry for more than 30 years, and his previous employers include Otis and Draka Elevator Products. He holds a BA in International Economics from Valparaiso University.

Dr.-Ing. Andreas Franz has been employed at Gustav Wolf Seil- und Drahtwerke GmbH & Co. KG since 1998 in the position of technical manager for steel wire rope. He is a member of the DSV (association of German steel wire rope makers) and EWRIS (European federation of wire rope industries). Prior to joining Gustav Wolf, Franz worked in the field of materials-handling technology. He earned his PhD in Engineering at the Dresden University of Technology.

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Variable-Frequency Drive Systems for Hydraulic Elevators

by Tony Aschwanden

An Overview

Elevators with hydraulic drives are flexible by definition. Almost infinite configurations of elevator and cabin designs are possible, a marked contrast to the somewhat limited mass-produced machine-room-less traction standard. The debate about climate change has triggered even more customer focus on energy efficiency. Some even jumped to proclaim the demise of the hydraulic elevator. However, it is now clear that with the right type of hydraulic drive, a hydraulic system can obtain class B energy efficiency.

Driven by a global discussion about energy efficiency, some providers of hydraulic drives have tackled this issue by bringing variable-frequency drives into their product range. These are presented as the perfect solution to the energy-conscious customer. Taking a closer look, the technically literate and critical observer will notice considerable differences between the various offerings. This article is designed to help the interested reader differentiate between the various types of energy-efficient hydraulic drives.

The Need for Variable-Frequency Drives

Irrespective of their use in traction or hydraulic systems, variable-voltage, variable-frequency (VVVF) elevator drives reduce energy consumption during the ride. The drawback is a relatively high standby energy usage. Conventional hydraulic drives use no energy at all during standby and are, therefore, perfect for infrequently used elevators (Usage Class 1). Using Bucher Hydraulics' electronic valve, these drives have been rated B according to VDI 4707 for more than 30 years. New designs of elevator control systems and VVVF drives now have much lower standby usage; therefore, VVVF drives have become a viable solution across a broader range of applications.

Types of Variable-Frequency Drives

Variable-frequency drives for hydraulic elevators are no novelty, having been built and installed successfully by Bucher Hydraulics worldwide since 1996. At Interlift 2009, a number of other manufacturers presented their own types of variable-frequency drives. There are marked differences between them (Table 1).

Conventional Up and Down Ride (Type a)

In a conventional hydraulic drive, after the start signal, the submerged motor runs up from zero to the maximum number of revolutions (typically 2,800 rpm). The pump delivers the maximum possible flow. To move up out of the starting level and stop at the destination level, speed needs to be controlled. This is done using a mechanical (two-speed) or electronic (variable-speed) control valve, which allows excess oil to flow back to the tank. More oil is pumped than is effectively used. This practice is not only poor for energy efficiency but also heats up the oil unnecessarily: Energy is converted to heat when the oil flow is diverted in the valve. Oil diversion in the valve also generates a certain level of noise.

In the following, the expression "conventional" will only refer to an electronically controlled valve. The LRV-1 works independently from temperature or pressure fluctuations thanks to a patented internal feedback loop. The ride curve can be set only once, with no tolerances or seasonal resetting required. A hydraulic elevator using an electronic valve uses approximately 30% less energy than the same one using a mechanical valve.

The mechanical valve is expected to be rendered obsolete in areas subject to the EN 81 standard by the adoption of Annex 3 to EN 81-2. It will become too difficult to achieve the required leveling precision of ±10 mm and redundancy requirements. (In comparison, Bucher Hydraulics' LRV-1 levels to ±3 mm.) Electronic valves such as the iValve have integrated redundancy and the capability for remote access.

Up Ride ▲	Down Ride ▼	Type
Conventional	Conventional (electronically controlled)	a
Frequency-drive controlled (VVVF)	Conventional (electronically controlled)	b1
	Frequency-drive controlled (VVVF)	b2
	Frequency-drive controlled (VVVF) with recovery	b3
	Variable-frequency drive with hydraulic recuperation	b4
Frequency controlled with load-dependent speed control (limited power connection)	Conventional (electronically controlled)	c1
	Frequency-drive controlled (VVVF)	c2
	Frequency-drive controlled (VVVF) with recovery	c3
	Variable-frequency drive with hydraulic recuperation	c4

Table 1: Different types of variable-frequency drives for hydraulic elevators

Continued

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Frequency-Drive-Controlled Up Ride (All b Types)

Using a variable-frequency drive for the up ride, only as much oil is pumped as is effectively required. The speed of the motor/pump combination is controlled directly by the VVVF drive, and the same flow feedback signal is used as for the electronic valve. VVVF drive control has an advantage of faster starting: the motor starts immediately without needing the 2-3 s. for Star Delta switchover. The actual motor rating is, however, no different with VVVF drives than for the conventional system.

The difference in energy consumption between VVVF-drive-controlled and conventional drives is realized during startup and slowdown. This means that the shorter the full-speed run is compared to the entire run time (or, the shorter the rides), the larger the energy-saving potential. The maximum number of rides without oil cooling is also higher.

Load-Dependent Speed Reduction/ Limited Power Connection (All c Types)

Most installed passenger elevators rarely run at full load. The typical run is more like this: The customer calls the empty elevator, then rides up to the destination floor. The elevator is, however, designed to handle maximum load during every ride. This means that the power supply needs to be dimensioned accordingly. Often during modernizations, the power supply into the building is limited, and increasing this can be complex and expensive. A current limiter can be the solution: If the load increases over a defined threshold (example: empty cabin plus one passenger), ride speed is automatically reduced, and current requirement remains below the threshold. In this way, the power-feed requirement can be reduced by up to 40% versus full-load/full-speed requirements. A VVVF drive is a prerequisite for this system to function.

Frequency-Drive-Controlled Down Ride (b2 and c2 Types)

During the down ride, oil is run back into the tank through the pump, driving the motor as a generator. The power thus generated cannot be used by a standard variable-frequency drive and is therefore "burnt off" using a brake resistor or similar device. The difference when compared to the conventional drive is that the heat no longer goes into the oil through flow diversion in the valve but can be dispersed anywhere (for example, in the lift shaft) through the brake resistor. The main advantage here is that the number of possible rides without required oil cooling rises significantly (typically up to 120 rides per hour).

Frequency-Drive-Controlled Down Ride with Recovery (b3 and c3 Types)

During the down ride, potential energy is converted into electrical energy. To do this, the pump motor acts as a generator. The power thus generated is converted by a special recovery unit and can then be fed back into the power grid. As a result, 30% of the energy that would otherwise be lost can be recovered. Instead of a separate recovery unit, a variable-frequency drive that has the recovery unit fitted inside the same enclosure is now often used.

Frequency-Drive-Controlled Down Ride with Hydraulic Recuperation (b4 and c4 Types)

In this type of system, a part of the potential energy is stored in a pressure accumulator. During the down ride, a high-pressure pump mounted on the same axis as the main pump/motor combination pumps oil into an accumulator, where it remains stored at high pressure. For the up ride, pressure is released to assist the main motor to drive the main pump. This system allows for another 30% energy savings versus the energy use of the standard VVVF drive. Only the load requires additional power. This high-end system not only saves energy through the hydraulic counterweight,

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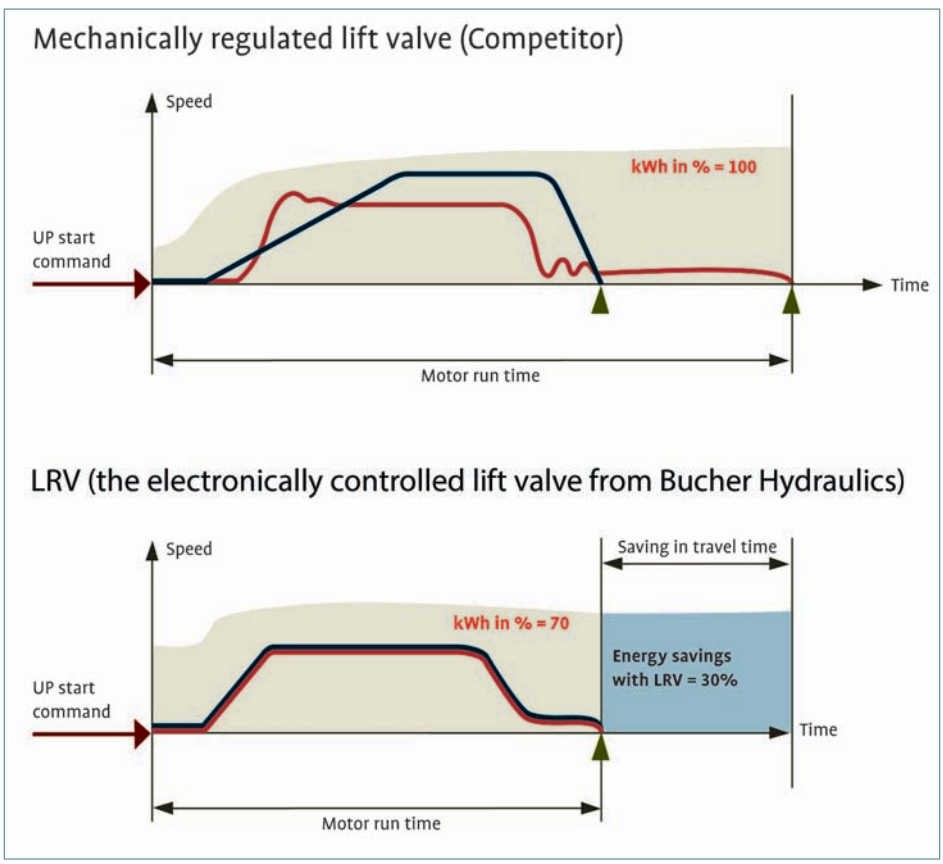

Figure 1: Drive curve and energy consumption of different conventional valves

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but also works with a smaller motor, and therefore has a lower power feed requirement.

Reasons for Using Variable-Frequency Drives with Hydraulic Power Units

In the previous section, we saw that there are many different ways to utilize variable-frequency drives. Each type has its own specific application, with different weighting and gray areas between them. Figure 2 helps the customer select the right drive type for specific applications.

Number of Travels:

High Ride Frequency

High-ride-frequency units include b2, b3, b4 and c2, c3, c4 types. Their applications are in airports, railway stations, shopping centers, hospitals, hotels, etc. The variable-frequency drive helps to reach a high ride frequency in two ways:

- Up ride: no more oil diversion during startup and slowdown of the elevator
- Down ride: heat generated does not go into the oil by using the motor as generator.

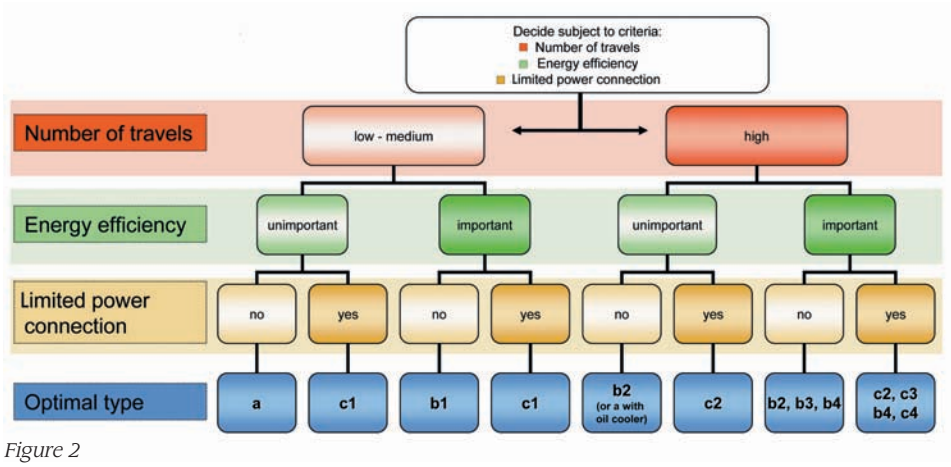


Figure 2

Previously, oil coolers were used for this type of application. At first sight, this seems the less expensive solution. However, oil coolers require fresh or even chilled air to function properly. The user must, therefore, provide for machine-room ventilation or air-conditioning, depending on environmental conditions. Oil coolers are also noisy, require space and use energy. Bucher Hydraulics believes using a variable-frequency drive is the more cost-effective solution over the long term.

Oil heating is not the only issue for this type of high-ride-frequency application. The power unit itself and all other system components must be dimensioned correctly for the extra load. It is irresponsible to use a conventional system and simply add a VVVF drive. The pump, for example, has very different loadings when pumping upward as when driving the motor as a generator; this needs

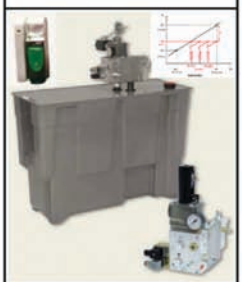
	Compact Line			Comfort Line
Bucher Hydraulics product	C-UDA	Compact VF	Compact VF with limited power connection	Saturn Beta
				
Product Finder type	a	b1	c1	a
Travels / h (without cooler)	low	medium	medium	low
Energy efficiency	low	medium	medium	low
Power connection	high	average	low	high
Starting charateristics	delayed	immediate	immediate	delayed
Noise	high	medium	medium	medium - low
Price	very advantageous	medium	medium	convenient
Usage category (according to VDI 4707 Part 1) typical application range	1 - residential building with up to 6 dwellings - small office or administrative building with few operation	2 - residential building with up to 20 dwellings - small office or administrative building with 2 to 5 floors - small hotel - goods lift with few operation	1 and 2 - residential building with up to 20 dwellings - small office or administrative building with 2 to 5 floors - small hotel - goods lift with few operation	2 and 3 - residential building with up to 50 dwellings - medium office or administrative building - medium-sized hotel - goods lift with medium operation

Table 2: The product range of Bucher Hydraulics AG with information on application areas

to be taken into account when selecting materials and design. There are significant differences between the various offerings on the market, so individual comparisons should be made.

Energy Efficiency

Energy efficiency can be accomplished in all installations suitable for hydraulic drives, including all b and c types. A decisive factor is that during the up ride, only as much oil is pumped as is actually required (no valve bypass). Versus a conventional mechanical valve system, up to 60% energy savings can be realized. The shorter the ride, the more energy is saved.

The down ride can only contribute to energy efficiency if the potential energy of the elevator is stored, then reused partially or fully for the subsequent up ride. This is currently only possible using the c4 type. Versus a conventional, mechanical valve system, up to 80% energy savings can be realized.

Feeding energy back into the grid during the down ride (b3 and c3 types) can also increase energy efficiency, albeit indirectly, since the energy cannot be used for the next up ride. The energy can be used inside the building for other consumers (in lighting, heating, air-conditioning, running computers, etc.). Only in rare cases will the grid operator allow power feedback into the grid itself.

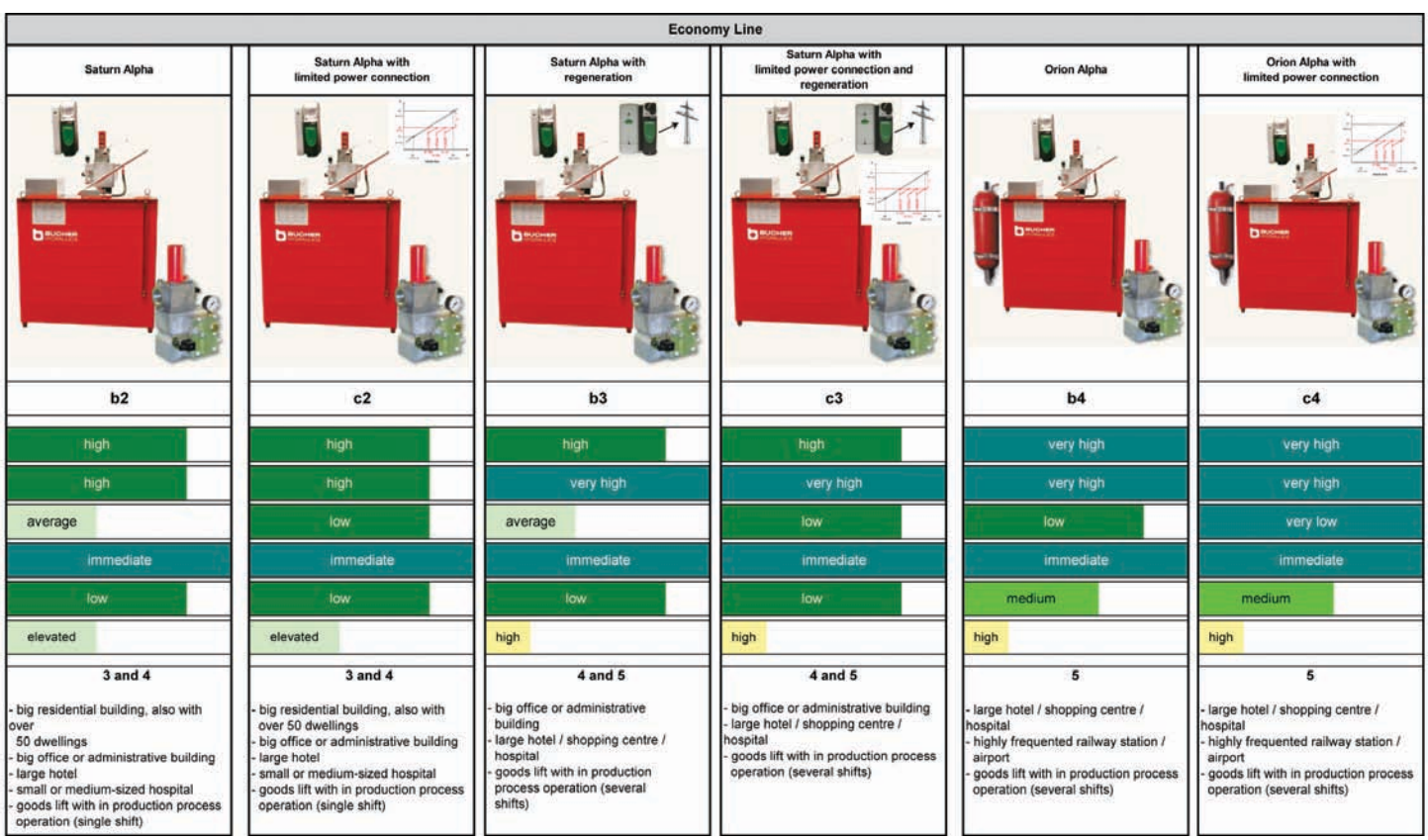
Load-Dependent Speed Reduction/ Current Limiter

If there are limitations to the available power supply, using a hydraulic counterweight (b4 or c4 types) or the load-dependent speed reduction (all c types), decent speeds can be achieved with a partially loaded cabin (or higher loads at the original speed). The hydraulic counterweight is used when high ride frequency is required despite limited power supply; for example, when modernizing elevators for railway stations or hotels. If ride frequency is not an issue, the more cost-effective "up-only" variable-frequency c1 drive type can be used. These types of installations are generally used in modernization projects with limited power supply.

Summary

As varied as the applications are, different types of hydraulic drives are necessary. Do not be distracted by catch phrases like "optimum performance"; the drive type should be selected carefully.

Tony Aschwanden has led the Elevator Application and Product Management group at Bucher Hydraulics in Switzerland since 2007. He specialized in automatic control technique and worked as a field service engineer for Rockwell (formerly Reliance Electric), a manufacturer of electrical drive, regulation and control systems. Aschwanden then joined ESEC (Europe) SA and worked as Product and Process manager for its Division Die Bonder. Afterward, he worked as project manager for ZEAG Ltd., a worldwide supplier of parking solutions. Aschwanden graduated in Electrical Engineering from the University of Lucerne (Switzerland).



Elevators' Horizontal Cousins Packed with Potential

by Lawrence J. Fabian

In the future, many large elevator lobbies will be designed for easy interface with horizontal movement systems. Automated people movers (APMs) are commonly known as people movers, shuttles, monorails and trams. A step up from moving walks, APMs are driverless horizontal passenger mobility systems. Like their vertical cousins, their performance and sophistication levels vary.

Some APMs are simple back-and-forth shuttles akin to an elevator between only two floors. More elaborate APMs serve a string of stations. High-end APMs are known as personal rapid transit (PRT), with taxi-sized vehicles and ramps that bring them off the main guideway (track) when they make a station stop, which can be adjacent to or even integrated within a civil building, such as an office tower, apartment complex, hospital or other large urban facility. (The term "PRT" is roughly equivalent to "podcar" and "automated transit network."). The building's elevators should be nearby, and the space between should be a place for interactions. These multimodal lobbies will have several mobility elements to interface with the APM – elevators, pedestrian circulation, stairways, and perhaps escalators and moving walks. APM stations are commonly found at large airports and hint at what lies in store for elevator professionals around the world.

Ultimately, to be managed as active public spaces, intermodal lobbies need careful design attention. If PRT is the horizontal mode, the off-line ramp can be located with great flexibility inside the building or against an exterior wall. Designers of multimodal lobbies will need to analyze and coordinate a wide range of dimensions and requirements. APM dimensions are considerably smaller for buses and rail transit. PRT guideway and station dimensions are even smaller. Moreover, for PRT systems, the area for boarding and de-boarding passengers is off the main guideway.

A multimodal lobby is unlikely to be at ground level. A building's main entrance(s) are, by definition, at ground level and convenient to sidewalks and streets. Of course, larger buildings – especially those on hills – can have several principal entries. However, APM engineers, seeking to avoid conflicting traffic, need to provide an exclusive (or well-protected) right-of-way. Thus, APM guideways are not generally placed at ground level. Because

Left: APM guideways at Orlando International Airport enter right into terminal buildings.

Top right: Some airport APMs are in lower-level tunnels.

Bottom right: What meets passengers when they exit a vehicle, such as this one at the Zurich Airport?

underground infrastructure is costly, APMs are typically envisioned and promoted as elevated infrastructure. As a result, stations are likely to be located at second- or third-floor levels. Basement-level alternatives are possible but expensive.

Securing District Benefits

Even some informed architects and engineers have not explored the many benefits of introducing APM guideways into a master plan. APMs can move not only passengers, but parcels, supplies and small cargo. On a district level, APMs can create easy and economic conduits for wires, cables, pneumatic tubes and heating/cooling fluids. If heating and cooling are included, APMs can also solve winter icing problems during frigid winters. Besides moving passengers, APM networks can transport parcels, supplies and small cargo.

So why aren't there more examples of multimodal lobbies, other than in a few dozen airports and large passenger terminals? Some point to high APM costs, while APM suppliers and consultants report that airports demand highly reliable service, often 24/7. Others blame architects' and public safety officials' lack of creativity and unfamiliarity with the many district benefits APMs can bring. Zoning and district management bureaucracies are inertial, but innovative district designs need flexibility and governmental support.

Public safety demands that lines of responsibility and command be unambiguous and explicit. Elevators, escalators and moving walks (hereafter referred to as "elevators") are governed

Continued

Elevators' Horizontal Cousins
Packed with Potential

Continued

by well-debated rules and regulations. Signatures with legal authority must be in place before an installation opens to the public. Routine inspections are mandatory. Reporting procedures are reviewed.

APMs are less commonly known to the disciplined worlds of building/elevator inspections and insurance reviews. Will APMs and their stations in intermodal lobbies fall under the same regulatory offices as elevators? Or, do they belong under rail authorities? The picture in the U.S. varies by state.

Who will have to worry about the cleanliness and security of multimodal lobby areas? Most likely, it will be someone within a specialized facility-management unit.

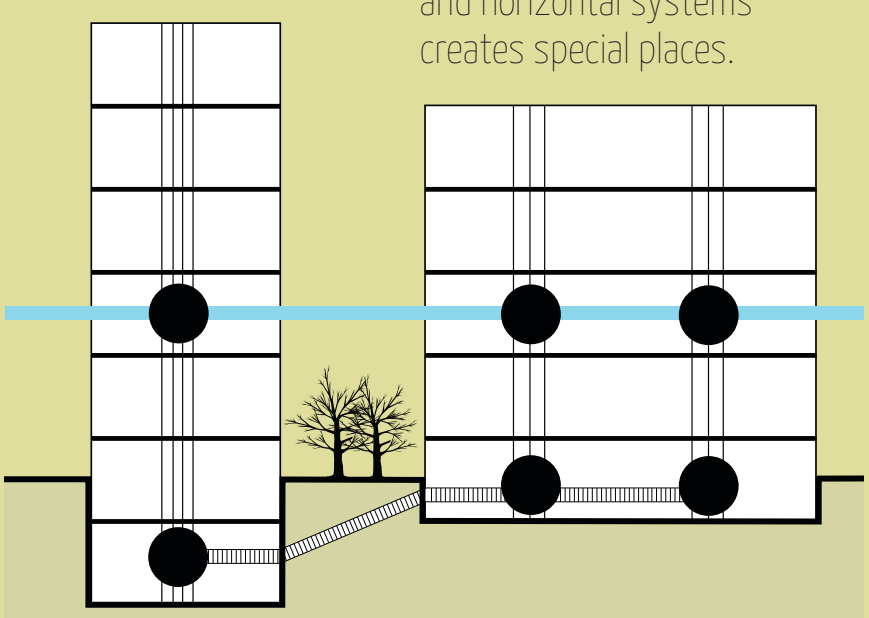
High Up or Over?

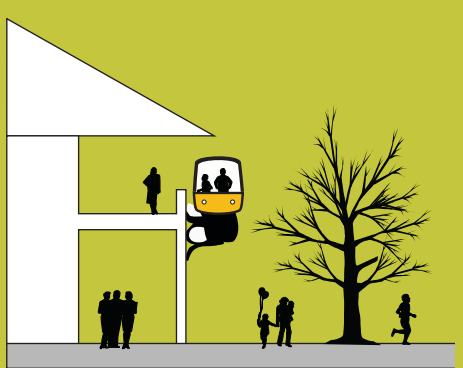
The 220-story Sky City is being built in Changsha, China (ELEVATOR WORLD India, 1st and 3rd Quarter 2013). It is largely ego that drives the decision to build such higher-than-thou structures. Economic and safety issues would lead more rational developers to spread all that floor space out into a district of, say, four 50-story buildings and integrate them horizontally. What is the optimal massing of floor space in a dense district? Where is the parking?

Many world urbanologists argue that very dense districts save agricultural and other land from sprawl. But is highest best? What is the optimal density? What is the best floor-to-area ratio? How high is good?

There are advantages and disadvantages in super-high living. Better views, visibility and prestige for users and residents are some of the advantages. Higher is better for rooftop telecommunications stations. On the other hand, is it psychologically good to live so high? Isn't a high structure more vulnerable to earthquakes and wind? It seems that more stability can be designed into shorter buildings integrated into a polygon of sorts, with APMs connecting them at one or more levels.

The intersection of vertical and horizontal systems creates special places.





Small-dimensioned APM guideways can be attached to buildings.

(adapted from an original sketch by Professor Emeritus Charles Harris, GSD)

More interesting strategies for parking also become apparent.

Integration in Perspective

Historically, cities had modest dimensions. Populations rarely exceeded one million, because citizens relied on walking. It was not until the 1800s that pressure for larger cities created intense demand for central spaces, hence incentives to build up. The elevator industry emerged in response to this pressure. Building height, limited by tolerance for climbing, rarely exceeded six floors.

Today, cities have grown larger, often exceeding populations of 10 million and creating horrible street and highway congestion with intolerable traffic accidents and carbon-dioxide (CO_2) pollution. In contemporary automobile-addicted cities, towns and sprawled regions, parking requirements stretch large districts horizontally to dimensions that are unwalkable. On foot, it's hard – almost impossible – to get around. In response to last-mile travel and delivery needs, the APM industry has emerged and needs to talk with the elevator world.

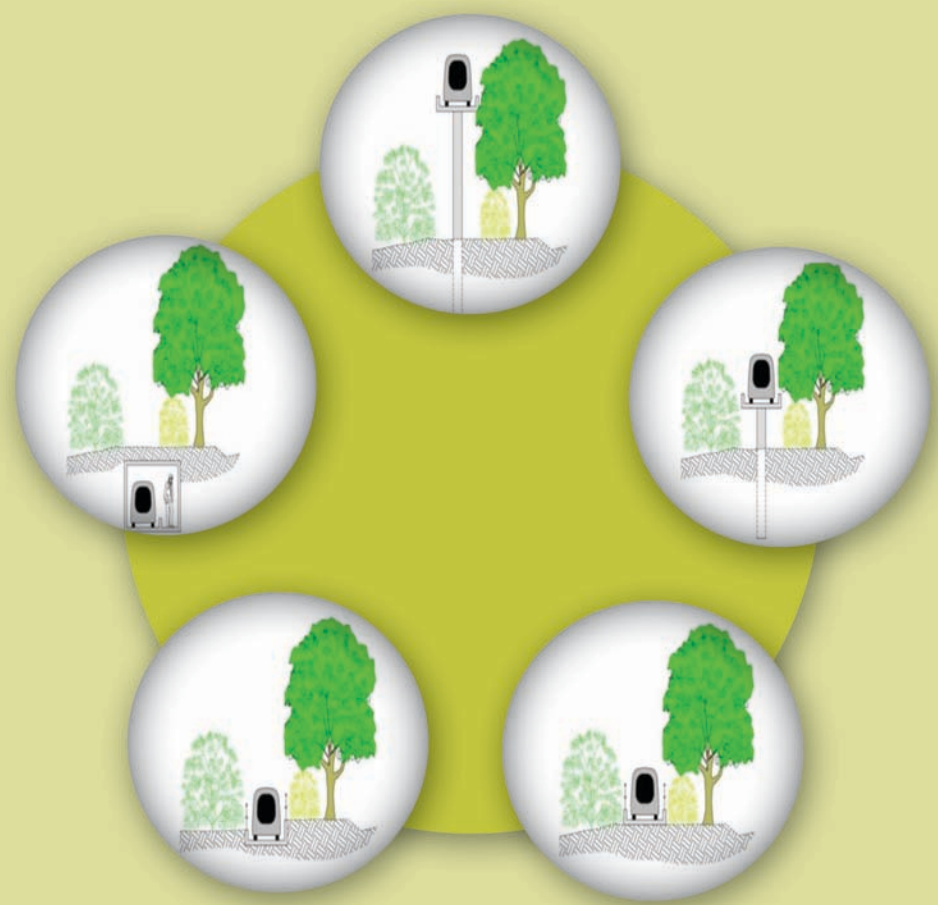
Where are the growth zones of tomorrow's cities? Rapid growth is taking place in Asia, Africa and Latin America, where each year, cities are absorbing thousands of migrants from rural areas and small towns. In the U.S., growth is modest and selective. Some southern states – Florida, Texas, Arizona and California – are growing rapidly and are largely highway-oriented.

Yet, even in slower growing or stagnant areas – the U.S. Heartland, Great Lakes belt and Northeast – airport officials are looking for better ways to provide parking, serve car-rental operations, and connect to hotels and convention and event facilities. Security concerns make de-clogging airport roads a priority. Environmental concerns make shifting from CO_2-spewing cars to electric transportation attractive. It is here where we will likely see progress in intermodal lobby design.

Medical and research districts are also growing in size and complexity. They have needs that a series of visitor-orienting lobbies interconnected by easy horizontal movements can satisfy.

Most metropolitan areas also have knowledge zones – districts with clusters of universities, colleges and research institutes – that create intense circulation needs and parking headaches. Other districts may be cultural and include museums, concert halls, etc. Yet others may cater to growing populations of senior citizens with their special needs and interests.

The future holds many opportunities for the elevator and APM worlds to interact. With mutually respectful synergy, APMs and elevators can help create urban areas that make for safer, healthier and more sustainable lives.



APM guideways can be elevated, partially elevated, protected at grade or underground.

(adapted from an original by PRT Consulting)

Indian Elevator Industry: Growth and Outlook

by Kanupriya Gupta

India has witnessed tremendous growth in residential complexes, hospitals, information-technology parks, educational institutions, laboratories, airports, corporate offices and government buildings. This is putting enormous pressure on such resources as energy, water and materials, and cost is ever a chief concern. The boost in Indian construction and urbanization after the financial crisis has created a huge demand for elevators. Millions of people relocating to the country's cities each year has resulted in less land and taller buildings, leading to high demand for elevators. Elevator companies are increasingly focused on offering complete and reliable solutions, while looking at the rapid increase in diversity and growth in the Indian realty market.

Five years ago, the situation was very different. The elevator business in the country had slumped, following the slowdown in the real-estate market. Manufacturers had to bide time for a recovery, as their fortunes are linked to home sales, especially high-rise residential apartments. For example, almost 60% of projects launched before 2008 in Mumbai, the National Capital Region, Chennai and Bangalore were delayed by more than two years, but many of these projects are finally reaching the end of their construction cycles. Currently, these metropolises drive the demand for elevators, with a 60% share. The rest comes from smaller towns with growing real-estate businesses, such as Bhopal, Nagpur, Indore, Aurangabad and Surat.

India has continued to register economic growth of 5-6% in the last two to three years, despite the global recession. Owing to this growth, its real-estate market is expanding quickly. Real-estate projects in India that reached US$100 billion in 2010 are expected to more than double to US$265 billion in 2020. But, this year, the growth rate has again slumped, and it has had a direct effect on the elevator industry. Adding to the growth of the real-estate market, the government's push to improve infrastructure in the 12th Five-Year Plan (12FYP) has also been a major boost to the elevator and escalator market. The government has approved the 12FYP, which initially aimed to achieve an annual average gross domestic product (GDP) growth of 8.2% between 2012 and 2017. However, this GDP growth projection was recently downgraded to 4%. That is a big concern for both the real-estate and elevator markets.

Sahadevan Eradi, deputy general manager of sales and marketing at Escon Elevators Pvt. Ltd., remarked:

> *"There has been growth in demand from tier-II and -III cities, and we do not envisage any delay in smaller projects. [Recession] is affecting [the] real-estate market, also. [Its] effect is not [as] strong as [it was] three years ago, but as the realty market [changes], it will affect our margins but not [our] volumes."*

Mega Trends

One of the key mega trends unfolding in India is urbanization. Under this, the four main trends are developing of mega cities, mega regions, mega corridors and mega slums. These are anticipated to give a strong impetus to the elevator and escalator market. Frost & Sullivan estimates this trend will have a sustained impact and set the stage for

Kanupriya Gupta is manager of Branding at Escon Elevators Pvt. Ltd.

visionary innovation, and the transformation of societies, markets and cultures.

India is expected to have 25 mega cities with a population of at least eight million and a GDP of US$250 million. Furthermore, "mega regions" are to be created when cities combine with suburbs or other nearby cities. India is expected to witness the creation of four mega regions by 2025, each with a population of more than 15 million. Two notable ones would be:

- New Delhi, Noida, Greater Noida, Ghaziabad, Gurgaon and Faridabad, with a combined population of 28.5 million
- Mumbai and nearby towns of Bhiwandi, Kalyan, Thane and Ulhasnagar, together having a population of 34.4 million

This expansion will definitely affect the real-estate market in a positive manner, which will synergistically grow the elevator industry.

What It Means for the Industry

Currently, the elevator market in India is recording sales of 40,000-45,000 units per year, compared to its 14,000-15,000 new units per year 10 years ago. The strong growth witnessed in the residential real-estate segment is boosting this market. Frost & Sullivan corroborates:

> *"The residential real-estate segment contributes to more than 50% of elevator sales in India. With several cities and state governments pursuing reforms to relax norms for environmental clearances, higher [multistory] buildings on smaller roads and lanes will soon become a reality. High-rise apartments are being touted as a panacea for rapidly overcrowding cities, and the elevators market is expected to grow at 15-17% in the next five to seven years."*

The commercial segment, particularly office space and mall space, has remained flat and shown signs of slowdown in the recent past. However, new office space, malls, hospitals, hotels and residential projects will be back on track once credit rates and inflation soften. In major cities, horizontal growth is limited, and municipal corporations are finding favor with the construction of high rises, augmenting the elevator and escalator market.

The Indian elevator and escalator market has enough space for all major manufacturers in this sector to grow and succeed. In this scenario, the best practice would be to undertake a comprehensive market due-diligence investigation covering industry analysis, customer analysis and competitor analysis before embarking on a long-term strategic roadmap.

Battling Crises in the Indian Construction Sector

by Srini Vuruputur

The Indian construction sector may have survived the crisis that developed from the global recession, but the rupee depreciation has been a source of worry, not only to the policymakers, but also to industry players. While problems like liquidity constraints, bureaucratic hassles, rising interest rates, shortage of skilled manpower and raw material, and a poor state of technology haunts investors, the government is fighting the perception of "policy paralysis" with its back to the wall by taking several concrete steps.

The construction industry is estimated to contribute 11-12% to India's gross domestic product (GDP), and the turnover is said to be US$200-250 billion. But, it has almost been stagnant in the last two to three years, given the range of problems the industry is facing. Construction-sector watchers feel the gloomy scenario is likely to change only after the next general elections, which are slated to be held next year.

The construction industry is the second-largest employer in the country, following agriculture, with approximately 18 million direct and more than 14 million indirect workers. It contributed approximately US$70 billion to the national GDP in 2010-2011, a share of 8%. The share would have been much higher if the industry had been supplied with the required manpower to meet its demand.

Infrastructure projects like ports, airports, roads and above-ground rail projects are taken up by several states. Their progress is moving at a snail's pace, due to vagaries of monsoons, the financial crunch and the short supply of raw materials (like cement and steel) and steep increases in their prices. The urban housing sector is where the private firms have been pumping money and expecting good returns.

Indian Minister for Statistics and Programme Implementation Srikant Kumar Jena has admitted that nearly 50% of the infrastructure projects monitored by his ministry are running behind schedule. "The central government is implementing 569 projects, each costing more than INR1.5 billion (US$24.44 million) and which are monitored by my ministry, and of [those], 277 projects are running behind schedule," he told the Indian Parliament in August. The minister attributed the delays in executing the projects to law-and-order problems, delay in land acquisition, rehabilitation and resettlement problems, fund constraints, delay in forest-and-environment clearances, right-of-way/-use issues, delay in supply of material, contractual issues, etc.

Referring to the mega infrastructure projects, Jena said that as of March 31, 204 mega projects were on the monitor for his ministry, out of which 103 reported delay. "A total cost overrun of INR1.15 trillion (US$18.77 billion) was reported by the project implementing agencies for these 204 projects," he added.

Ernst & Young's report "Infrastructure 2013 Global Priorities, Global Insights" says that about 42% of a total 564 infrastructure projects have been delayed, and the average private-public partnership initiative takes approximately five years to gain approval.

Continued

Srini Vuruputur is a senior journalist based in India and has worked for reputed English-language dailies in Oman and Bahrain.

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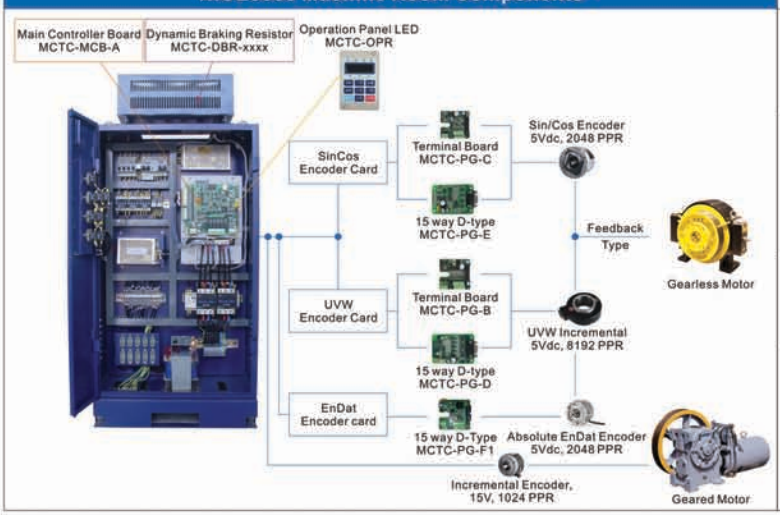

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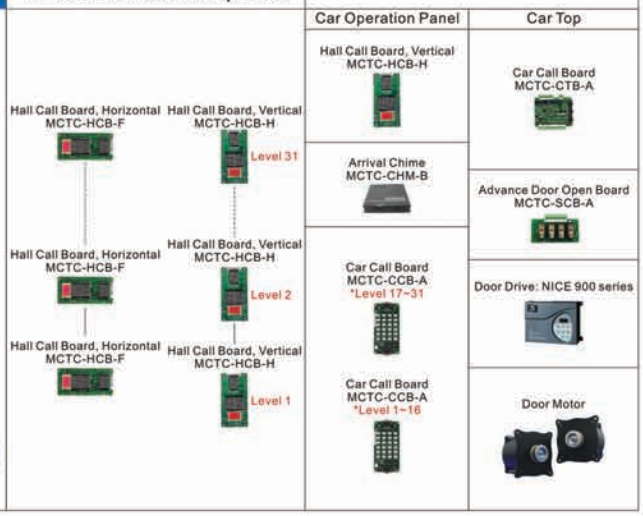

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Singh

The Cabinet Committee on Investments, chaired by Prime Minister Dr. Manmohan Singh, has recently approved fast-track clearances to 36 stalled infrastructure projects, including as many as 28 projects in the power sector, entailing an expenditure of approximately US$30 billion. However, serious doubts are being raised in industry circles over the impact of the government's belated decision.


Sandhir

Of the 28 power projects in limbo, 18 are held back due to issues related to fuel-supply agreements, and the concerned ministry has been asked to resolve the issue at the earliest. The issue has been so serious that the Indian government's plans to add power capacity of 78,700 MW during the 11th Five-Year Plan (2007-2012) went awry. It only achieved 70% of the target, adding 54,964 MW. The government has set a target of 80,000 MW for the 12th Five-Year Plan (between 2012-2017).

According to Sachin Sandhir, managing director of the Royal Institute of Chartered Surveyors (RICS) South Asia:

"The construction sector faces several challenges, such as liquidity constraints, tough weather conditions, shortage of raw materials and delays, due [to] various clearances from the government. The biggest challenge, however, is skills shortage. The shortage is visible across all levels, such as quantity surveyors [and] other construction professionals, [such as] bricklayers, plasterers, plumbers, carpenters and electricians."

According to Sandhir, construction firms are regulated under multiple laws, and there is no unified regulatory framework. The sector lacks an efficient and stable regime for dispute resolution in contracts, leading to costly and time-consuming disputes between project promoters and contractors. He continued:

"Although the flow of bank credit has improved to the construction industry, institutional finance still remains inadequate. High cost of [financing] translates into high costs for the industry and the economy. Presently, [the] construction industry suffers from [a] poor state of technology leading to inefficiencies, wastage and low value added."

Industry expert and Group Economist at Raymond Ltd. Ritesh Kumar Singh says the industry has been excessively leveraged and is in serious trouble at present, because of the high and rising cost of borrowing, regulatory hurdles, problems in land acquisition and cost and availability of labor. He explained:

"The falling rupee and the rising oil prices have a double effect on the inflation. The imported components in all the sectors have become 25% more costly in just two months, which will end up [resulting in] huge cost overruns on the [infrastructure] and housing projects. For a country with limited foreign-exchange reserves and imports significantly higher than that of exports, the depreciation of [the] Indian rupee at the current speed is a nightmare. Again, the elections and the new government will have a significant role to play in harnessing the foreign direct investment (FDI) [and] private equity, and allocating

Continued

Work Underway/Coming Soon

Some of the projects in the construction industry coming up are:

- 20,000 km of new and upgraded roads over the next five years
- The Delhi-Mumbai Industrial Corridor: creation of an industrial corridor between Mumbai and Delhi financed by a consortium of companies, including those from Japan. Six new cities, a dedicated freight line, and power and desalination projects are likely to come up along the corridor.
- In Mumbai, an elevated freight-rail corridor, a new airport and a trans-harbor link are progressing.
- Two regional rapid-transit systems connecting Delhi to neighboring states Haryana and Uttar Pradesh at a cost of US$12 billion.

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the budgets for these [infrastructure] projects, where [the] government has to be in the driver's seat."

Dinesh Musalekar, general manager India, Middle East and Africa for global elevator company Avire, added:

"Though India has the potential to become the third-largest construction industry by 2025 with an annual turnover of US$1 trillion, the present state of affairs is not encouraging and appears to remain this way at least over the next 10-12 months at the minimum. As the supply exceeded demand with three to six months of inventories in the building sectors, the property rates and the rentals have been nose diving and are expected to gain momentum in their downward fall over the coming months.

"The interest rates are going up on the housing loans and the construction projects are helpless, as they are not able to generate project [financing]. Many of the ongoing projects in commercial and residential sectors have slowed down drastically, and not many new projects are kicking off the ground. Part of the problem is due to the overall slowdown of the economy, apart from other external factors. While the infrastructure projects are going on all over the country, there are no bidders for the second phase of sea link projects in Mumbai, which is certainly not a good sign. Adding to the woes are [a] series of scams and slowdown of the economic reforms, [which are] keeping away the FDI in many sectors."


Musalekar

However, Musalekar hopes the situation will change after the Indian Parliament general elections, scheduled to be held in March/April 2014. Sharing the view, Sandhir says that on account of rapid urbanization across Indian cities, the sector is expected to grow. This will continue to drive the construction industry at 16-17% compound annual growth rate (CAGR) over the next 10 years. Sandhir continued:

"The RICS second-quarter 2013 survey corroborates the trend that the sector would witness increased workloads in the next 12 months, despite the current challenges resulting from financial constraints, as well as ongoing issues relating to the regulatory and planning environment."

In the housing sector, the shortage is to the tune of 25 million (according to the Indian government's March 2007 estimation), and 96% of this shortage is for the poorer sections of society, for which the government is providing subsidy. The demand is expected to double by 2020 due to the growing nuclearization of families and the migration of people to urban areas looking for better jobs.

Since the government cannot build enough houses for all the poor, policymakers are planning to ask private developers to reserve 35% of the houses in their projects for these sections. In return, the government provides them land and other concessions. The policy is still in its formative stages. Sandhir said of it:

"This proposal will result in an increased supply for the segment, resulting in the reduction [of] the overall housing shortage. It will also impact the growth of related industries, as [the] housing sector supports 250 ancillary industries. The enhanced construction activity will thus support these industries and help in income generation for millions who are employed directly and indirectly."

Echoing similar feelings, Musalekar added:

"It can have a positive effect in major metros, where lots of prime lands are occupied by the poor in the form of slums. This plan will release the land for construction of high-rise buildings in the prime locations in cities like Mumbai, and the people residing in these slums can be relocated [to] better living conditions in the buildings. This can work out as a 'win win' for all the stakeholders, if implemented honestly without any wasted interests by the stakeholders."

However, Singh disagrees with their view, commenting:

"If the government pays the market price for 35% of the units built by private developers, it will not directly affect the sector, but will further add to India's fiscal deficit, and that, in turn, will cause hardening of [the] interest rate -- not good news for overleveraged [infrastructure] companies."

As India is expected to witness exponential growth in its population in the coming years, the demand for housing also shoots up. The population is likely to be 1.28 billion in two years and 1.38 billion by 2020. Of them, 65-70% will be migrating to urban areas, putting huge pressure on the government to provide them with quality roads, houses and other infrastructure.

According to RICS' research "Real Estate and Construction Professionals in India by 2020," based on population growth estimates, the incremental annual demand or requirement for real-estate space (including space for basic civic amenities) in India is estimated to be in the range of 10,145 million sq. ft. in 2020. Statistics reveal that more than 85% of the potential requirement would fall under residential and industrial categories.

Sandhir says:

"The demand for real-estate space and infrastructure will lead to higher demand for manpower in the sector. However, we do not have

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The course is designed for everyone who works with or around lifts. Lift engineers, consultants, and owners and managers of lift maintenance companies are not only taught the basics of lift technology, they also learn the essential aspects necessary to work safely and independently on and around lift installations.

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the required skilled workforce to achieve the expected growth. Current supply in [the] built environment comprises nearly 50 million people, of which only 2 million are professionally qualified, while [the] remaining are semiskilled and unskilled workers. The existing supply of core [professionals in] architecture, engineering and planning is miniscule compared to the soaring demand."

The number of unskilled construction laborers has risen significantly over the years, from approximately 10.67 million in 1995 to approximately 25.60 million by 2005, depicting a CAGR of approximately 9.15%. Singh concluded:

"If we were to assume that unskilled labor will continue to grow at the same pace, then by 2015, the number of unskilled workers in the industry will account for approximately 61.42 million by 2015 and a further 95.14 million by 2020. It is, therefore, imperative that even the nonprofessional strata of the workforce engaged in the sector have the essential skills that will enable them to meet the changing and ever-evolving needs and demands of the built environment.

"[The] shortage of skilled manpower is a common problem India Inc. is facing these days. Given the scale of the problem. . . [the] shortage of requisite manpower will continue to haunt the industry, unless some drastic measures [are] taken to address the problem."

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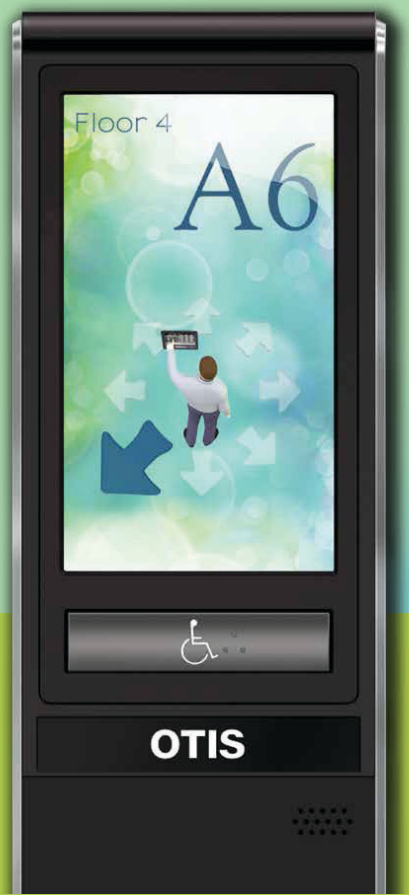

Otis Launches CompassPlus

by Angela C. Baldwin

In August, ELEVATOR WORLD India had the opportunity to talk with Otis team members about the company's latest product poised to hit the global marketplace this fall. CompassPlus™, a destination-management system Otis says "fundamentally changes the way people move through buildings," was announced internally at the company in early August. The product builds on the company's Compass™ destination-management system technology, which has been in place since 2003, its first installation being the then-newly constructed 7 World Trade Center building in New York City. CompassPlus is the latest in a string of recent major new product releases from Otis, including Skyrise Elevators, featured in some of the world's tallest buildings, and the NCE escalator, the first escalator that offers green features as standard.

Research for the advancement of the original Compass product was conducted over months by talking with architects, consultants and existing Compass customers. Six months prior to the official internal August announcement of CompassPlus, Otis' sales team began demonstrating and selling the new product. According to Product Manager North America Joseph Armas, feedback on the product has been very good, and three major North American projects currently under construction have already purchased CompassPlus – The Wilshire Grand in Los Angeles; LUMINA, also known as 201 Folsom St., in San Francisco; and the latest Amazon building in Seattle. The first running installation will likely be a modernization project scheduled for completion in mid 2014.

"In the last seven years, the industry has accepted [destination-dispatch] technology," Armas said. "What makes CompassPlus unique is it brings back a level of personal service, like an elevator attendant could in the old days – greeting you, letting you know about the weather and restaurants nearby. Our Concierge and Create software allows for customized iPhone-like interfaces at different times of day that can be programmed by the building owners instead of by Otis – that is one thing we are really proud of."

CompassPlus (photo above) offers a virtual concierge, with intuitive screens that help guide passengers through their journey and provide customized service.

According to Regional Sales Manager-CompassPlus Mariah Martino, "The beauty of CompassPlus is watching the system in real time and how it adjusts to the needs of the passengers without the need of an engineer. This system came from the voices of our clients. They asked: 'What else can we do?' 'What else do we need?' 'What else can we use?' CompassPlus is the result of their questions."

CompassPlus Overview

CompassPlus replaces the traditional up-and-down push-button elevator system with an array of customizable touch-capable fixtures in the elevator lobbies. A passenger enters his or her destination from the hallway, rather than from inside the elevator, using a keypad or touchscreen device; receives an elevator assignment, which is shown on the touchscreen; follows directions to the assigned elevator; and proceeds to his or her destination.

According to Armas, Otis' patented Smart-Grouping technology allows CompassPlus to group passengers by destinations and stops, getting them to their destinations up to 50% faster than conventional dispatching systems do. "The system allows dynamic zoning throughout the building. Our goal is to create express runs throughout the building as often as we can," he explained. CompassPlus is also energy efficient, offering up to 27% energy savings compared to conventional elevator systems, Armas added. But, according to Martino, CompassPlus does much more than just revolutionize how people move through buildings – it also includes advanced software that enables an array of functions.

"Our goal is to create express runs throughout the building as often as we can."

Compass Concierge and Compass Create

Included with CompassPlus is Compass Concierge, a software interface that creates a virtual environment to guide passengers throughout their journey. Concierge allows the fixture screen to have customizable services like welcome screens, popular building destination icons, express runs for VIP passengers and more.

"...It brings back a level of personal service, like an elevator attendant could in the old days..."

It also integrates with third-party building security systems, and the fixtures host an integrated security card reader. The Compass Create software system enables building owners to customize the screens' designs to match their building's style and branding.

Flexible Design, Competitive Cost

Existing Compass customers will not have a difficult transition if they wish to upgrade to CompassPlus, said Martino.

"Our legacy systems are compatible with CompassPlus. Adding Compass Concierge or Compass Create can be done using existing fixtures or upgrading to new ones. We can adapt to the building's needs; if the lobby has a certain aesthetic, various floors can have different looks. In five or 10 years, the building may change design or owners or tenants, and the software, features and fixtures can be adapted."

Though CompassPlus offers flexible aesthetics, there is a standard available, according to Armas, and he says, "People are positive regarding the design." There are standard signage and floor indicators but being able to offer options is a benefit to customers, said Armas.

All touchscreens have a mechanical Americans with Disabilities Act button as a standard feature. Upon pressing it, verbal commands are given, directing the potential passenger to the elevator to the left or right of him/her, and longer dwell time on the door is allowed.

The installation of CompassPlus can be done efficiently, and the cost of the system is competitive, said Martino. "And the more people get a chance to experience CompassPlus, the more successful it will be," she said.

Have your company's new or improved products showcased in Product Spotlight.

Product Spotlight article submissions should be sent to the Elevator World Editorial Department at one of the following addresses:

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COLOR TFT LCD TOUCHSCREENS

Mitsubishi Electric has announced the launch of an upgraded line of touch panels. Sales of the 15-in. XGA and 19-in. SXGA color thin-film-transistor liquid-crystal-display (TFT LCD) modules with touch panels the company calls "intuitive" were scheduled to start in August at Mitsubishi Electric offices worldwide. Mitsubishi Electric said it planned to produce 1,000 15-in. and 500 19-in. units per month. "The two additions to the company's DIAFINE lineup have larger screens and are intended to offer additional options for a broader range of industrial applications for touch-panel screens compared to existing XGA modules ranging from 6.5-12.1 in. and WXGA modules ranging from 9-10.6 in.

For more information, contact Mitsubishi Electric at website: www.mitsubishielectric.com.

PEOPLE FLOW INTELLIGENCE

KONE has announced its People Flow® Intelligence suite of "smart solutions" designed to guide building visitors and tenants effectively and smoothly from a structure's front entrance to their desired destination, while also improving building security. The suite includes access control, destination guidance, information communication and equipment monitoring. The solutions are modular, flexible and third-party compatible, meaning building owners can either take the entire integrated package or choose specific solutions to complement their existing building systems.

Heikki Leppänen, KONE executive vice president, New Equipment Business, explained the impetus for the new products:

> *"We know that property owners and developers are under increasing pressure to ensure their tenants can move around buildings as quickly and comfortably as possible, and simultaneously provide improved security and access control. At the same time, building users expect to be able to move through various public spaces smoothly and intuitively."*

The access solutions are to seamlessly connect elevators with all entry points in a building, including turnstiles and automatic doors. They take into account the number of people waiting to use the elevators and their destination floors when they assign and guide individual users to their assigned elevators. This is intended to improve elevator traffic-handling capacity and performance, leading to less-crowded elevators, shorter travel times and fewer stops. In addition to the replacement of traditional call buttons by touchscreens, the solutions offer the KONE RemoteCall™ mobile app, which allows users to call an elevator from anywhere in the building using their smartphones.

KONE's information screens can be placed inside elevator cars or anywhere else in a building. Uses for them include guiding building users to their destination, providing information about the building and serving as a platform for media content. The monitoring aspect of the suite enables the surveillance of elevators and escalators in real time across multiple locations.

For more information, visit website: www.kone.com/peopleflowintelligence.

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Schindler Has High Hopes for New Solar Elevator

by Kaija Wilkinson

Schindler R&D headquarters in Ebikon, Switzerland, where one of two solar-elevator prototypes was installed.

Schindler officials hope that a solar-powered elevator inspired by the much-ballyhooed, zero-fuel Solar Impulse plane on which it is a partner (ELEVATOR WORLD India, 2nd Quarter 2013) will become popular among customers who want to be environmentally conscious or avoid unreliable power service. The company unveiled its Solar Elevator, a modification of its standard 3300 gearless machine-room-less elevator, in April 2013. Geared toward the residential and low-rise commercial market, it is being introduced in Europe and India in 2013 and to other worldwide markets in 2014 and beyond. It is expected to be available to the U.S. market in 2015, and Washington, D.C–real estate firm Akridge has said it plans to install a solar elevator in one of its commercial buildings as soon as it is introduced.

(l-r) Schindler R&D Director Frank Resch with Bertrand Piccard, pilot and co-founder of Solar Impulse, at a press conference in Washington, D.C., in June 2013.

Despite displaying Schindler's advanced building information models for elevator and escalator planning at the American Institute of Architects Convention in Denver in June, it was the Solar Elevator that stole the show, according to Chris Smith, director of public relations and marketing at Schindler Elevator.

Frank Resch, Schindler's director of R&D in Ebikon, Switzerland, said the idea to retrofit the Schindler 3300 into a solar elevator was born about five years ago. The 3300, according to the company, is already up to 60% more energy efficient than a hydraulic elevator. The hybrid system, meanwhile, draws up to 100% of an elevator's power from the sun via rooftop solar panels and Schindler's proprietary Hybrid Power Manager (HPM), which stores solar energy in batteries until it is ready to be used. A one-phase grid connection provides backup power, a simpler and less costly alternative to the standard three-phase connection. A frequency converter boasts a standby power mode, and the system has controls that automatically switch car lights to standby. Prototypes installed at a residential complex in Barcelona and the Schindler Headquarters in Ebikon are performing well, according to the company.

Schindler declines to say how much it invested to develop and bring the product to market. As far as how much it costs, that depends on factors such as range, solar coverage, payload and usage, Resch said. "Of course,

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yearlong sunny environments like California would be better suited for the product than say, Alaska, which has long, dark winters," he said. "It also depends on what the customer wants – maybe he just wants it to bridge situations where power is expensive. There is a broad range of applications."

Schindler has a tool that estimates coverage and cost based on an individual's needs, Smith noted. The product carries what he described as a "slight premium" over the cost of the standard 3300, thanks to the battery system and HPM. "However, when you consider the energy costs over the span of the system into the total cost of ownership, the payback can amount to significant savings overall," he said. The system also avoids costly power peaks that occur when elevators start each trip.

> "I can tell you that the Solar Elevator was the number-one attraction at our booth," Smith said. "It was generating a lot of buzz – we were very surprised."

Since Schindler's Solar Elevator uses the 3300 as the system's base, it can travel as far as any other 3300. The solar elevator is suitable for up to 80% of the residential market, according to Schindler, with the ability to travel up to 30 m and make up to 10 stops. An installation's details – payload, size of the solar-panel array, etc. – determine how close to 100% solar powered the system will be. On average, it travels at 1 mps, Resch said, "so it's not a system where the performance is below our standard 3300 (powered by the grid). It's got exactly the same performance criteria and speed payload."

Installing the system would "obviously help someone hit goals" toward achieving Leadership in Energy & Environmental Design certification or something similar, he added. That promises to be a selling point in environmentally conscious western Europe, Resch said, and in parts of the U.S. Potential customers in India, however, will be interested in the product for different reasons, he said – namely, their interest in keeping elevators running despite sometimes poor power service, as the system can run independent from the power grid.

Schindler hopes solar elevators will become more desirable as the world population, especially in cities, grows. "Cities make up nearly 75% of the energy used globally, while covering only 2% of its footprint," Smith said, quoting figures from the United Nations (UN). Other global trends reported by the UN that could dovetail with demand for solar power include:

- About 2.5 billion people are expected to be added to the current 7 billion within the next 15 years, representing a 35% increase.

The elevator at the residential complex in Barcelona, where the other prototype was installed.

- More than 60% of citizens will move to major cities in the next 15 years.
- Modern urban planners will be looking for new ways and new products that move more people in less time, with greater ease, using less energy.
- Smarter cities demand new innovations for energy-saving and reliable mobility technologies.

With all that potential demand, is a solar-powered escalator in the works? Not right now, Resch said. "The focus is clearly on the elevator market and on the volume and the benefits we think we can get with the applications," he said. "On other hand, since the drive technology on an escalator is not any different, that's something we may consider later on."

ELEVATOR WORLD India Source Directory

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by Ben Abbaspour

This book presents a roadmap of elevator design and acts as a complete guide to practical engineering based on the *American Society of Mechanical Engineers A17.1-2007/ Canadian Standards Authority B44-07 Safety Code for Elevators and Escalators*. With more than 45 examples for essential and comprehensive elevator calculations relating to both traction and hydraulic units, *Elevator Engineering* is suitable for a wide audience.

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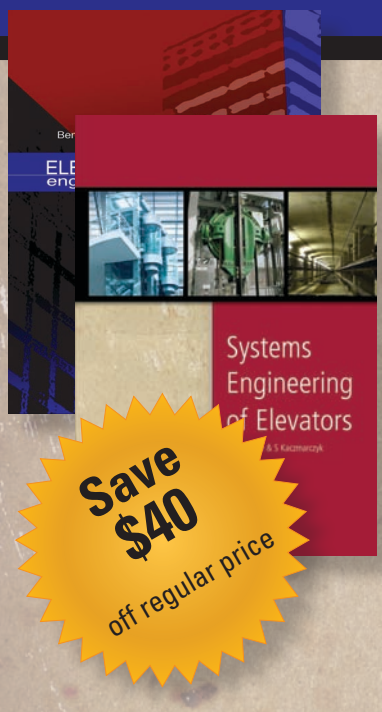

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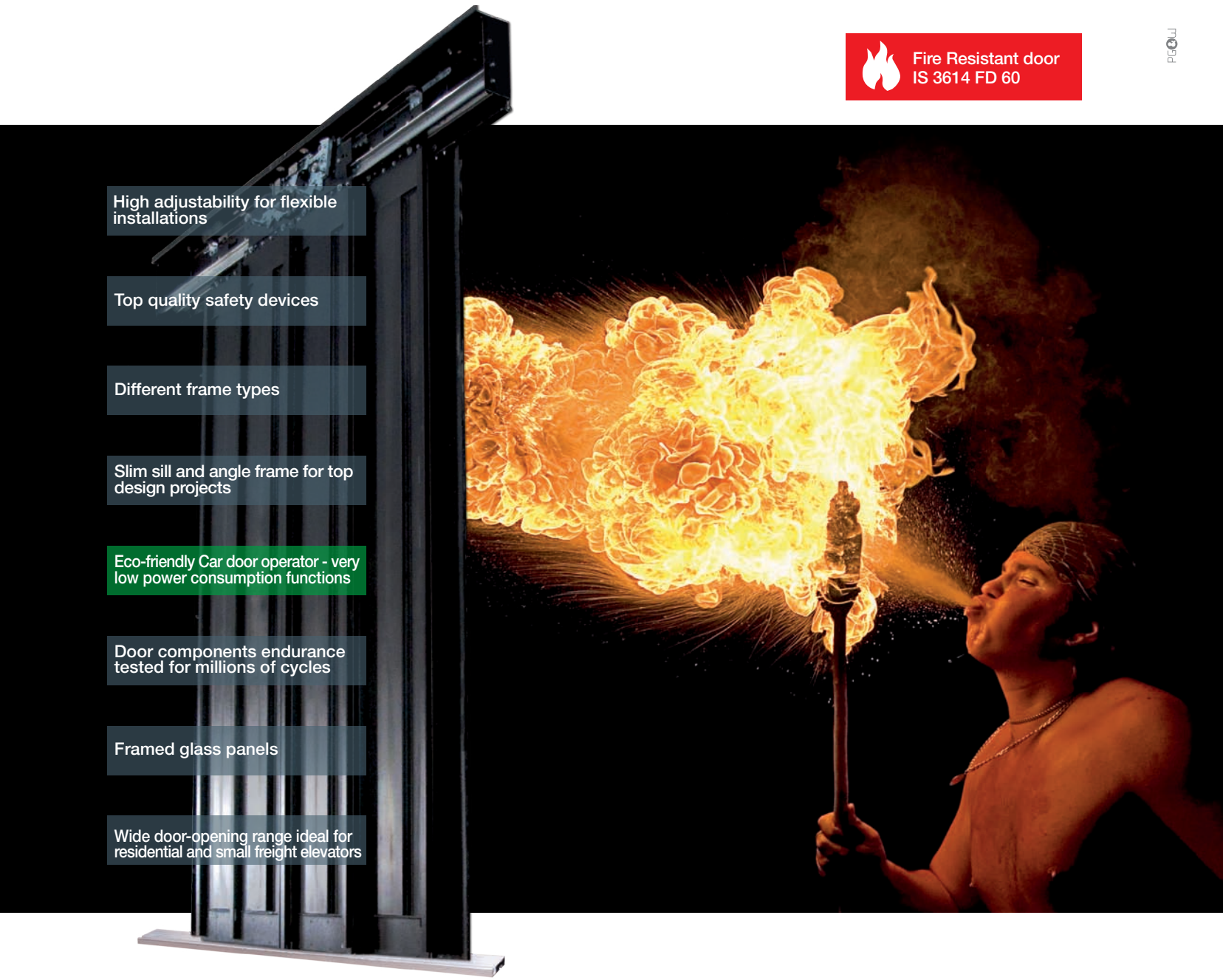

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