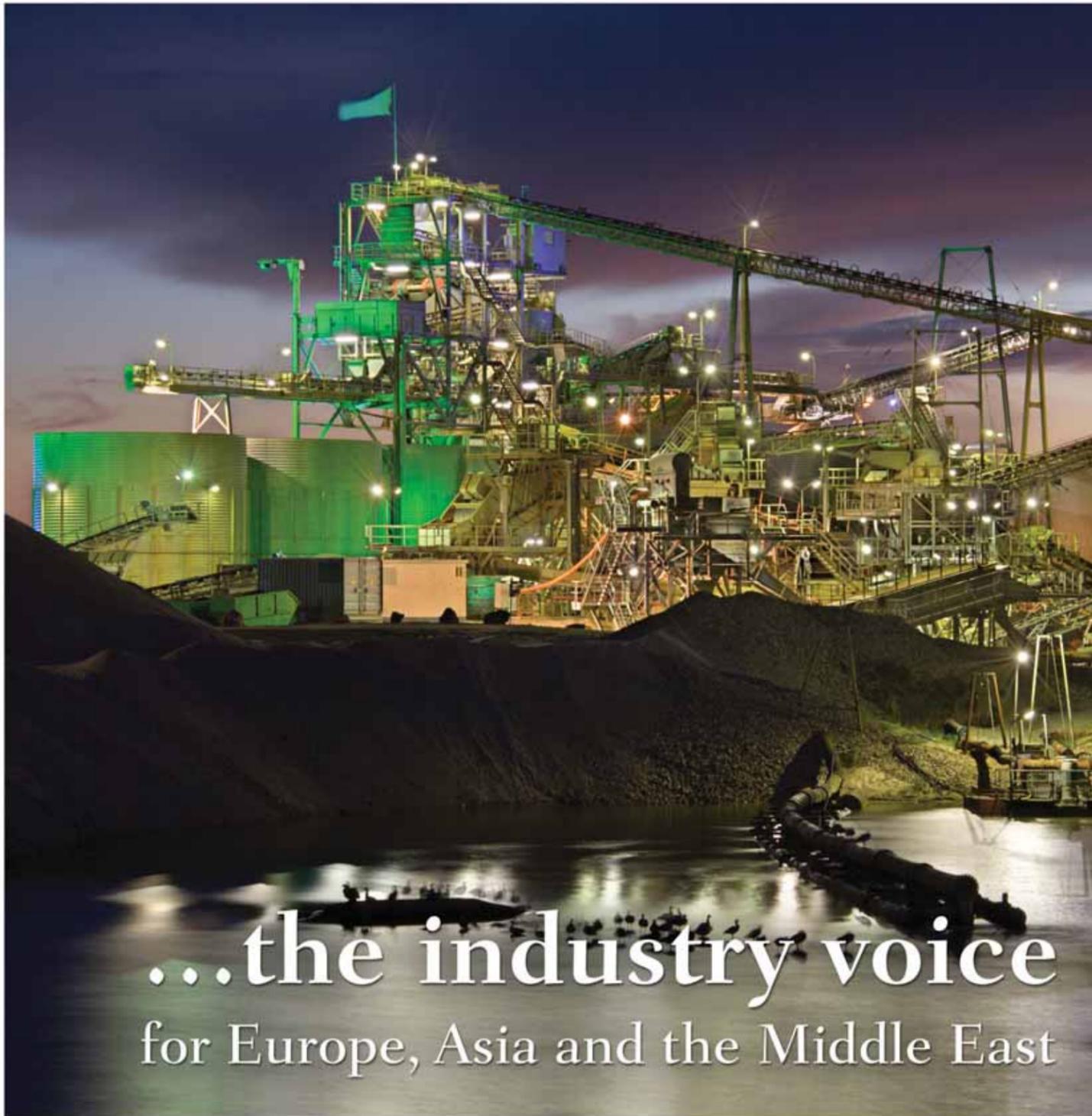


euroasia industry



MINING & REFINING ISSUE | AUSTRALIA COUNTRY FOCUS | TECHNOLOGY REPORT – TAKING THE HEAT
ENVIRONMENT REPORT – MICRO GENERATION | TRADE REPORT – PRESENT & FUTURE CHALLENGES



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editorial

Life cycles

Welcome to our latest issue of EuroAsia Industry magazine, featuring companies from across the industrial spectrum covering mining, construction, oil and gas, engineering and utilities. In this issue we feature many of the world's largest and most respected companies, including Aker Floating Production, Arabtec Construction, Alutec, Barker Mohandas and many more. In addition, our independent editorial delivers incisive articles and reports covering a wide range of industry sectors and functional disciplines. With Mining and Refining under the spotlight, we look at how the rise in commodity prices has driven this sector, particularly in the area of precious metals such as gold. Our environmental report looks at the latest initiatives in renewable energies and poses the question: 'Are governments too focused on large scale generation, when micro generation could be the answer'. Our trade report looks at how the WTO has influenced world trade over the last few decades and what challenges may lie ahead. Our technology feature provides an insight into the developments in super-alloys and the part they play in increased efficiency and safety in modern turbines and jet engines. Finally, our country report focuses on Australia and their position at the forefront of mining technology and innovation.

In one of the most intense and extraordinary sessions of legislative wrangling in modern times, Henry Paulson, the exhausted US Treasury Secretary, finally persuaded the Republican and Democratic leaderships to agree to a compromise deal, on the \$700 billion rescue plan for the US economy, just hours before the Asian markets opened. The \$700 billion

would be disbursed in stages, with \$250 billion made available immediately for the Treasury's use. Whether this will save the system is yet to be seen, but the world's central bankers seem very determined to avoid a complete collapse and are going to ever-greater lengths to keep the 'party' going.

There had been crises before the 1840s, including such spectacular events as the collapse of the Dutch tulip mania in the 1630s. There have been crises since the 19th century, including the Great Wall Street Crash of 1929. We are not dealing with a unique phenomenon now, but with a recurrent event that the world economy has always survived in the end. In fact, it is a well-documented observation that the economy, like the many natural systems in the world, is subject to cycles. The Kondratieff wave cycle for instance, suggests four distinct phases: beneficial inflation (spring), stagflation (summer), beneficial deflation (autumn), and deflation (winter). Since the last Kondratieff cycle ended around 1949, we have seen beneficial inflation 1949-1966, stagflation 1966-1982, beneficial deflation 1982-2000 and according to Kondratieff, we are now in the (winter) deflation cycle which should lead to depression. Whether we can avoid this is yet to be seen, but if successful, who knows, maybe we can finally break many more of life's seemingly harsh cycles, dispensing with winter and eventually cheating death itself. It seems unlikely though, and worth bearing in mind, that of the few phenomena that exhibit unchecked growth, cancers are the most notable.

The Industry Voice for Europe, Asia and the Middle East.

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UPLIFTING DESIGNS

Barker Mohandas LLC is a global elevator consultancy firm with extensive experience spanning system innovation, design, evaluation, modernisation and engineering services on premier construction projects around the globe. Eric Payne spoke to three of the company's Principals, including co-founder Mr Rick Barker and engineers, Paul Bennett and Mike Spaner, about elevator design and the important role Barker Mohandas has in enabling many of the world's most prestigious construction projects to move ahead.

Barker Mohandas is a global company with offices in the USA and Singapore, and an associate company in the UK. Their typical clients are building owners/developers, architects, and consulting engineering firms. At the moment they are most heavily focused on the design of new building systems. By way of summary, their projects are either tall, complex or large, where someone needs to make a decision when they're buying lots of lifts. Their clients sometimes include lift manufacturers. Mr Barker states, "We are flattered when a major lift manufacturer comes to us for a second opinion or requesting a little technical help."

Mr Barker begins with a concise summary of exactly what it is an elevator consultancy provides for its customers. "Our most fundamental service is to determine how many lifts are required for a building, how big and fast they are, which floors they serve, and how they are arranged as a system in different groups, for passengers, and for 'back-of-house' purposes. As well as helping to solve the many issues that go along with that, in multi-use buildings, buildings with car parks and podiums, and so on. Our differentiators include the powerful software tools we use to conduct these services productively without guesswork, helping to find optimal lift 'grouping' solutions for high-rise buildings, and semi-automatically generate drawings and other information. Our main differentiators are our experience, in how lifts relate to other building systems and security and safety issues, planning for vertical circulation to avoid traffic issues that can affect security and fire safety, and our expertise in elevator product engineering."

An elite team

The company, Barker Mohandas, was founded 8 years ago by old friends and work colleagues Rick Barker and Paliath Mohandas, who met while working as executives for the Otis Elevator Company. Mr Barker elaborates, "At

The Key Technical Team of Barker Mohandas (top left to right: Principals Rick Barker, Mike Spaner, and Paul Bennett; bottom left to right: Technology Director, George Wisner and Chief Engineer, Dr. Clem Skalski)



Living Wall Project, Amman, Jordan
Architect: Foster+Partners, London
Engineer: Buro Happold, London

Otis I was director of technical services worldwide, particularly for tall and special building projects and products, while 'Mohan' was responsible for all operations in South-East Asia where he had successfully led Otis in the Petronas Twin Towers project in Kuala Lumpur, drawing on his wide experience from planning the world's first four double deck lift systems. The two of us were introduced by Otis' then-president, Jean Pierre Van Rooy, as the only people in the company with 'high end' lift consulting experience. I was then asked to lead pre-construction technical support for Mohan's busy area of the world, in particular.

"Both our roots lay in planning lift systems for tall buildings. This began when we worked



The Wheel Icon Hotel, Dubai Promenade, UAE
Owner/Developer: Nakheel, UAE
Design Consultant: WS Atkins & Partners Overseas, Dubai

for different multi-disciplined consulting engineering firms in Manhattan (JB&B and Cosentini) leading their 'vertical transportation' departments." Mr Barker says, "I think we both joined Otis because we wanted to do more than count lift hoistways. So, after leaving Otis, it was only natural for us to hook-up." This collaborative spirit has infused all of Barker Mohandas' activities. Undoubtedly, one of the keys to the company's success is the exceptional team of people they have put together. "I have to mention our key people, as they are a part of any strategy we can conceive, helping to provide answers at times when some others are still contemplating the question," says Mr Barker.

"As consulting engagements grew, some very high-end lift engineers joined us, to add capabilities to study and/or design all aspects of a lift. The first to join our co-founders was the best 'lift scientist' I know, Dr. Clem Skalski, who is now our chief engineer. Clem was instrumental in developing motion controls used on today's high-speed lifts, and was involved in many advanced R&D projects involving active guidance for lifts, linear motors, and so on. His prior experience included MagLev designs and his first task for us was to develop a powerful software tool, in MATLAB®, to determine the power requirements and heat release for any lift, including those for use in tall buildings, which are usually custom-designed. In rapid succession, George Wisner joined us as technology director. George has a similarly strong product research background coming from United Technologies Research Centre, and later leading lift power electronics drives development at Otis.

"Eventually, our talent was truly rounded off when Paul Bennett and Mike Spaner joined us as principals. Paul is the best lift mechanical engineer I know, he has led development of safety systems and their certification and testing for tall building lifts, and has designed most other mechanical parts for lifts, including a lift capable of handling a locomotive (specifically, the Channel Tunnel boring machine). Mike is our youngest and brightest principal who was a lift electrical and systems design engineer, and brings with him regenerative fuel cell experience as well. Our hope is that someday Mike will be the one giving these interviews.

"Soon after we opened in the USA, we opened a company in Singapore, called Barker Mohandas Consulting Pte Ltd. Not long after that, we decided to partner with a newly-forming consultancy in the UK, founded on

the basis that we would handle their advanced technical and high-rise support.

"Of course our growth depends directly upon our clients, and this began with some relationships that pre-existed our formation. The most important one initially was Pei Partnership Architects, who have also helped sustain us with some large and enjoyable projects. And I should mention why this relationship is successful: They are architects at their deepest roots who seek out and well orchestrate the advice they receive from their key consultants."

Finding the perfect solution

When the company was founded Barker Mohandas spent about a year with no consulting income developing some of their unique software tools and processes, to enable them to open their consultancy with these differentiators in hand, and supplement their uniquely-strong CV's. Mr Barker explains, "In lift consulting the buildings that we specialise in are rather large and the architect or owner is often not sure if he/she wants it short and fat, tall and slender, or something in between. The answers to these questions need quite a few computations and that is where having the right software tool becomes essential.

"One of my responsibilities at Otis included strategy for developing software tools to assist in the design of lift systems for tall buildings that would involve multiple elevators and multiple groups of elevators. Now, while they were very good at the deep down details of lift product design their tools had some significant limitations in the system planning sense. So, the idea was to find a tool that could find all system solutions within a given set of parameters that several manufacturers could build, to help us find the optimal solution for the client. Mike Spaner was our software consultant back then, helping in the early hours to build our 'optimisation' tool for finding lift system solutions for high-rise buildings involving multiple groups of lifts."

Mr Spaner continues, "The tools that we use, scientifically find more than one viable solution. This means we are able to get closer to client needs, established through discussion around the table and sculpted into solutions, in a way that you couldn't do using traditional methods alone.

"The other purpose of the tool is to save time. In consulting it is very important to respond to architects and owners very quickly, with many possible options, in terms of cost, core space or performance – depending upon the particular clients key objectives and

requirements." Mr Bennet elaborates, "an elevator consultant doing these calculations manually would take forever and you would never have time to ensure that the client got the optimum solution. The benefit of the tool that was developed here is that it finds all the possible solutions and you can pick. The bottom line being that it helps ensure the client gets the optimum solution."

Mr Barker adds "I have a lot of experience using computers to design lift systems, but this was always one lift group at a time. I was amazed with the results of this new software tool, which has returned solutions that I would not have thought of or been able to achieve before within the same time constraints. For instance, conforming to the concept of an architect's unique tower shaped like a flower, or an architect calling me on the way back from a city saying, 'how tall can I make this building, to make it the city's tallest, using the same core footprint?' And having the answer in about 20 minutes." Mr Barker concludes, "Our business demonstrates the power of what can be achieved, when you start with limited resources but some really excellent people."

Making a better product

"Secondly, in software development – clients or architects might think we have CAD details available for infinite sizes and arrangements of lifts, but we don't. If we were drawing things with individual lines or using libraries from AutoCAD we would need a whole floor of drafting people, re-inventing the wheel all the time."

"This is why another piece of software we developed was a parametric tool to generate CAD drawings automatically. At companies like Otis we were using software packages that were costly, such as Pro Engineer, which is not very affordable for a small firm. So, we wrote our own, using a combination of Microsoft applications, proved it could work, but lo and behold years later we found a software company developing a similar product that had put lots of money and time into it. We purchased their advanced version used by lift manufacturers, which enabled us to focus on other things."

Mr Spaner adds, "there is a higher level philosophy here which is; take the domain expertise that we have in-house and couple it with technology in order to get a consistent

high quality, therefore, high response business for the client. If that means creating our own tools, we will do it. If it means integrating the best of other tools already out there, we will do that. Basically, we use the tools that will best serve customer needs. Whether it is for traffic analysis or CAD work or specification writing, whatever it is, we are constantly asking ourselves, 'what tool can we either integrate or create to make a better product?'"

Around the world

As a global firm Barker Mohandas has to be flexible in order to meet different customer requirements in different regions, whether those be regulated by codes, culture or custom. Mr Barker explains, "each client will have their own objectives but generally, in a geographical area there are certain trends. China, for example, is fairly prescriptive; there are strict code requirements, they're conservative, and they typically work for buildings of specific height. The first task, in any region is always to address those standards. What is more of a challenge is to suggest something that goes beyond those standards. ▶

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Visionaire Project, Battery Park City, Manhattan, NYC
Owner/Developer: Albanese Organization, New York
Architects: Pelli Clarke Pelli Architects, CT and
SLCE Architects, NYC
MEP Engineer: Cosentini Associates

Design for Al Burj Project, Dubai, UAE
Owner/Developer: Nakheel, UAE
Architect: Pei Partnership Architects, NYC



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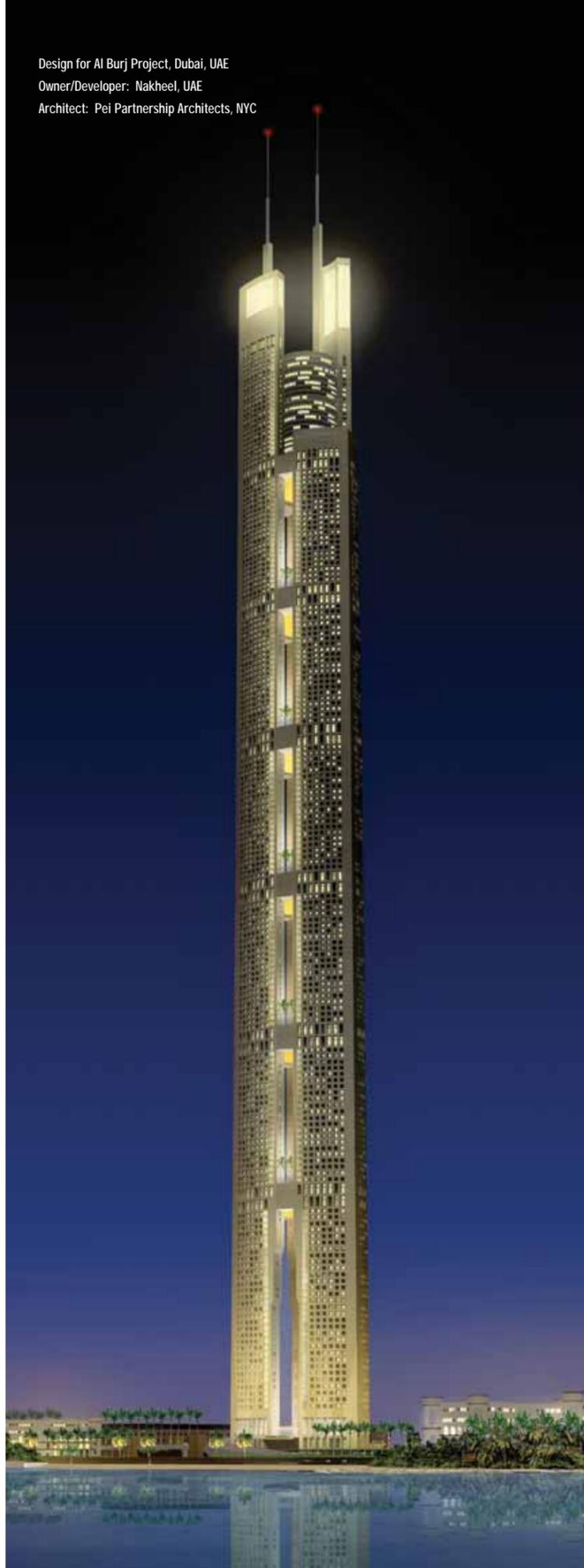
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"The taller the building the more the codes seem to fall short in either coverage or practicality. As a result, we don't just settle for limitations in a present code. For example, there's a requirement that started in the UK, to have a firefighters' lift capable of reaching the top of a building in a single bound – like Superman – in 60 seconds." Mr Barker explains, "What we are trying to do is harmonise the best of this country or that country. The UK showed us things, like the firefighters' lift, for example, which is still not done as well in the US. But we do other things in this country that are pretty good, so we tend to infuse some practicality with British best practise and then take this into a very tall building."

"Where this experience is really valuable is when you are working on a country's first tall building. In Vietnam, for example, in Ho Chi Minh City, we have the Bitexcoland Financial Tower, which will be the country's tallest building, at least for now. At the start of the project the client wanted American codes. Our advice was that there are really good things about the American codes, but there's some really good things about European codes too. We suggested a harmonised version of international codes, and have used this model on many projects.

We've been in Jordan also, the same situation, and in other countries wanting to do tall buildings that's been our approach. I would say that almost universally, the suggestions that we make in the area of fire fighter's lifts have been accepted. We understand that we are just the lift consultants and a design like that involves many other disciplines: stair location, emergency power, water protection, and pressurisation to avoid smoke entering the lift well. We're part of that solution, definitely, we are often the catalyst, but we have to realise that the lifts are just a subsystem of the building, and we need to coordinate with experts in other systems.

The sky's the limit

"There is certainly still a trend for tall buildings, and even taller buildings," says Mr Barker. In fact, Barker Mohandas is involved in what will be America's tallest building and of the world's very tallest, the Chicago Spire, providing a 'peer review' service for the owner, a role that started by interviewing elevator consultants who would handle the actual design.

"With the super high-rise, we sometimes start a design by asking, 'how far can a lift travel with today's elevator equipment?' We well know the capabilities of the manufacturers equipment. After all, we helped design some of that equipment, and good relationships with

the engineers at multiple companies means we can continually ask the right questions. We know the limitations of where they are today, and in some sense the limitations are fine – if you plan an elevator to go 150 stories, you have to wait for it to come back! So, a lot of solutions come down to technique, not technology. That said, we are asked to push the limit a little bit. So, I would say to your question that the current height of buildings is set by the physical and code limits of lifts produced by major manufacturers, such as Otis, Mitsubishi, Schindler, ThyssenKrupp, and Kone.

Mr Spaner informs us, "In addition to the equipment challenges, we often have to think about the fact that these super tall buildings are in fact multiple buildings integrated together, and this firm brings the expertise necessary to be able to handle that complexity." Mr Barker continues, "For a tall building, we are a key part of the design team. It usually starts with the architect, the structural engineer, us, and the mechanical engineer. At this stage we often suggest where an office might be placed in a building versus where the hotel is in the same building. Offices require more lifts than hotels, and that will suggest a certain layout at the design phase. Of course, everybody wants an observation deck at the top of their super tall tower, so that's something we need to deal with."

Mr Barker informs us, "lift and economic constraints effect the size of the core of the building and drive the program owner's brief for the tower. Also, as buildings get taller, questions regarding evacuation will increase. So, we need to find ways to plan in redundancy, so there are safe alternatives. This part of the process involves working very closely with other project designers who protect the lifts, so they don't smell smoke, they don't feel heat, etc.

"Another challenge in buildings of this height and size is that they tend to move. The wind forces on the building will move the building horizontally so there will be some sway. Well, that natural wave frequency could excite the elevator's wire ropes – it's not depending on height, it's just if we happen to hit that frequency and where. So, there are a number of strategies we have to look at and consider, and we have a number of tools and solutions in our arsenal for dealing with that issue."

Custom lifts

"We also plan some very custom lifts for some very unique buildings. This is a particular area of 'fun' for us, especially when manufacturers say they cannot be involved, because they no longer have the people available, and/or are

focused on mass-market model lifts. Work on these projects always begins with a lot of questions. Have we thought about reliability and maintenance? Have we thought about rescues and other emergencies? Many practical questions. Then we all start applying an imaginative process, call it 'imagineers' if you will, the Disney term. This is when the architect, structural engineer and ourselves have some fun – how to hide things, how to shape things, and, also, let's not forget the ability to recall history, and pull ideas from the database."

An early example of a custom lift solution developed by the company is the special lift and escalator designs they provided for a science centre in Macau. For that project "we were asked to plan a leaning lift that was truly an elevator, with all the safety requirements, and ride quality of an elevator, which was a challenge at an incline. We feel we solved the ride quality issues for such a lift and manufacturers who priced the design agreed with that. It was probably the first practical solution for ride quality for an inclined lift. Unfortunately, the costs were outside the client's budget so that did not proceed.

Jumping ahead, right at this very moment, there is a project we are doing with a major client in Dubai called Nakheel. They are doing a 157m high wheel-shaped luxury beachfront hotel, the signature development in the Dubai Promenade project. We were encouraged to be involved with this project because of the design of some very special lifts in the middle of the hole, called 'sky lifts'. At one time they were likened to a project in Paris called Le Grande Arche, for which Otis developed what they called 'duo-lifts', where one lift counterweights the other and they are wide open, in the open air. Well, the design will likely not proceed that way but it will be unique in accordance with the visions the architect and owner have for their iconic project.

Mr Bennet discusses a project with Foster + Partners and Buro Happold consisting of multiple medium-rise buildings infused into a hillside in Amman. "The 'Living Wall' project, as it is known, is built into a cliff side, and on top of the cliff there is an existing hospital, where they've added one tower which is a clinical building, a hotel for people with relatives in the hospital area, wanting to stay over night, two apartment towers for the doctors and clinicians, and an office tower. The towers start at the top of the cliff and go down into the cliff, for nine floors, which are a combination of retail, leisure and car parking. So, there are dedicated lifts in there for each of the towers and common lifts and escalators"

Shenyang Financial Tower Project, Shenyang, PRC
 Owner/Developer:
 Henderson Land, Hong Kong
 Architects: Pei Partnership Architects, NYC and Aedas, Hong Kong



...serving the retail, the leisure and the car parking. The horizontal circulation was much more difficult than the vertical circulation on that building, as people would move around this complex, which presented some interesting studies in pedestrian circulation.”

Another major project Mr Barker is keen to mention is the Rotating Tower Technology projects with architect David Fisher, in Moscow and Dubai. “In these projects each floor rotates individually, which allows the shape of the building to change elegantly, as well as the views from the interior. Presently,

neither the lifts nor their travel pattern rotate, though we have received such requests on other projects!”

Energy-efficient

Mr Barker explains, “Presently we are focused on specifying or designing lift systems that are very energy-efficient. George Wisner, our technology director and I were part of a group of experts involved in green product design and strategy at Otis, Mike Spaner, in addition to his experience with a lift manufacturer, comes to us from a company involved in designing and manufacturing regenerative fuel cells, and another member of our team has done consulting in power systems not involving lifts. Our people were going ‘green’ long before it was fashionable.

“We were hired for this purpose on a high-rise residential building in Manhattan by the owner, the Albanese Organization, who were seeking a Platinum LEED® certification by the U.S. Green Building Council. While this is the highest rating, the owner wanted to take some next steps involving elevators. The project is called the Visionaire and is now in the later stage of construction. An earlier project by this owner achieved this rating, becoming the first high-rise residential tower in the USA to do so.”

Mr Barker states, “Today is a good time for an energy efficient lift. The motors have become very efficient, the motor drives and power electronics are very clean with a high power factor, and they allow regeneration back into the building grid.” There is a “temptation to make products that are overly cost reduced and overly lightweight just so you can say it’s energy efficient. But, for us, knowing down deep design, it is crucial that the lift remain robust. Very little should shortcut robustness and nothing should shortcut safety. Those

remain our prime requisites.” Mr Spaner confirms, “There is a real opportunity to help make elevators sustainable, and one of the ways that our firm can do it is through the specifications that we produce.” Also, “There are certainly opportunities for specifying new sustainable materials. This is still a new, emerging area where we anticipate a lot of positive change.”

The next generation

The vastly experienced team of consultants at Barker Mohandas find themselves in a very privileged position, “sitting on the front end of customer needs,” a role that the company regards with the utmost seriousness. Mr Spaner asserts, “We encourage competitive bidding for our clients. If someone is reading this article and saying, why do I need Barker Mohandas? That’s probably a good reason. Having Barker Mohandas on the team will give you a competitive solution and add value to the project as a whole.”

Mr Barker explains, “If we were back at a manufacturer we would have probably increased our patent resume considerably. However, our goal has been to encourage competition, for our clients.” Consequently, “right now, we do nothing more than copyright designs, because we want anybody to be able to produce the design, for the project, for our client, but not take it as their own. When you put a team like this together – collectively, our key consultants are named on 85 USA patents, all assigned to a major lift manufacturer – possibilities emerge. Many of us were involved in the R&D of high-end elevator products. For a relatively small firm among giants in the lift industry, we probably have the highest per-capita skills in our industry. Naturally, when you put these things together with the speed and flexibility of a smaller firm and you are on

the front-end of customers’ needs, possibilities emerge. It is a good problem, although we do not have time to dwell on that right now with our work load.”

Most exciting of all are hints that Mr Barker makes towards possible future advances in lift technology, which he expects will “speak to the next generation of lifts, after all lifts have basically remained the same since Elisha Otis, when he proved that lifts with ropes are safe. We are being pulled into some of these next generation things and we’ll see. Right now, we are thankful that so many projects like this get funded. It lets us have some fun.”

Future growth

Mr Barker asserts, “Our future plans are to handle our growth, to keep the same quality. We are carefully planning a representative office in India and the Gulf region, with a good leader slated for both, but doing this in a way that keeps our quality consistently high, well utilising our resources here at the core. Some consultancies have problems in this area, becoming very decentralised, franchising a brand name but perhaps the quality of that brand is diffused.” Mr Spaner suggests, “In actuality it’s a relentless pursuit of better quality! Even when we have what we think is a top quality specification for a job, we will look at that specification or portions thereof as we move to the next job and ask, ‘how can we make it better, based on what we’ve learnt in the last month, or even the last week? So, it’s not just maintaining a level of quality – it’s a relentless pursuit of higher quality.”

Mr Barker attests, “What sets us apart from our competition I believe starts with the expertise and experience of our consultants, followed by the level of software tool or design process we build. Quite often lift consultants are former lift salespersons or technicians. While lift, commercial and field, experience is very important, this is usually not enough for what we do at our core. Having people who can provide the right answers quickly is important, equally important is being proactive in consulting. Sometimes a client may be asking the wrong question, or not asking us to study enough alternatives, which we need to volunteer. These things have contributed to a growth rate, in fees billed, that has averaged 37 per cent over the past three years.”

With Barker Mohandas currently enjoying an enviable degree of success, working on some of the most prestigious construction projects on the planet, one can see few obstacles standing in the way of this continuing long into the future. □



Rendering of Rotating Tower Project, Moscow
 Architect: David Fisher
 Engineers: LERA, NYC (Structure) and Lehr Consultants International, NYC (MEP)



Bitexcoland Financial Tower, Ho Chi Minh City, Vietnam
 Architects: Carlos Zapata Studio, NYC and AREP, Paris
 Construction Manager: Turner International