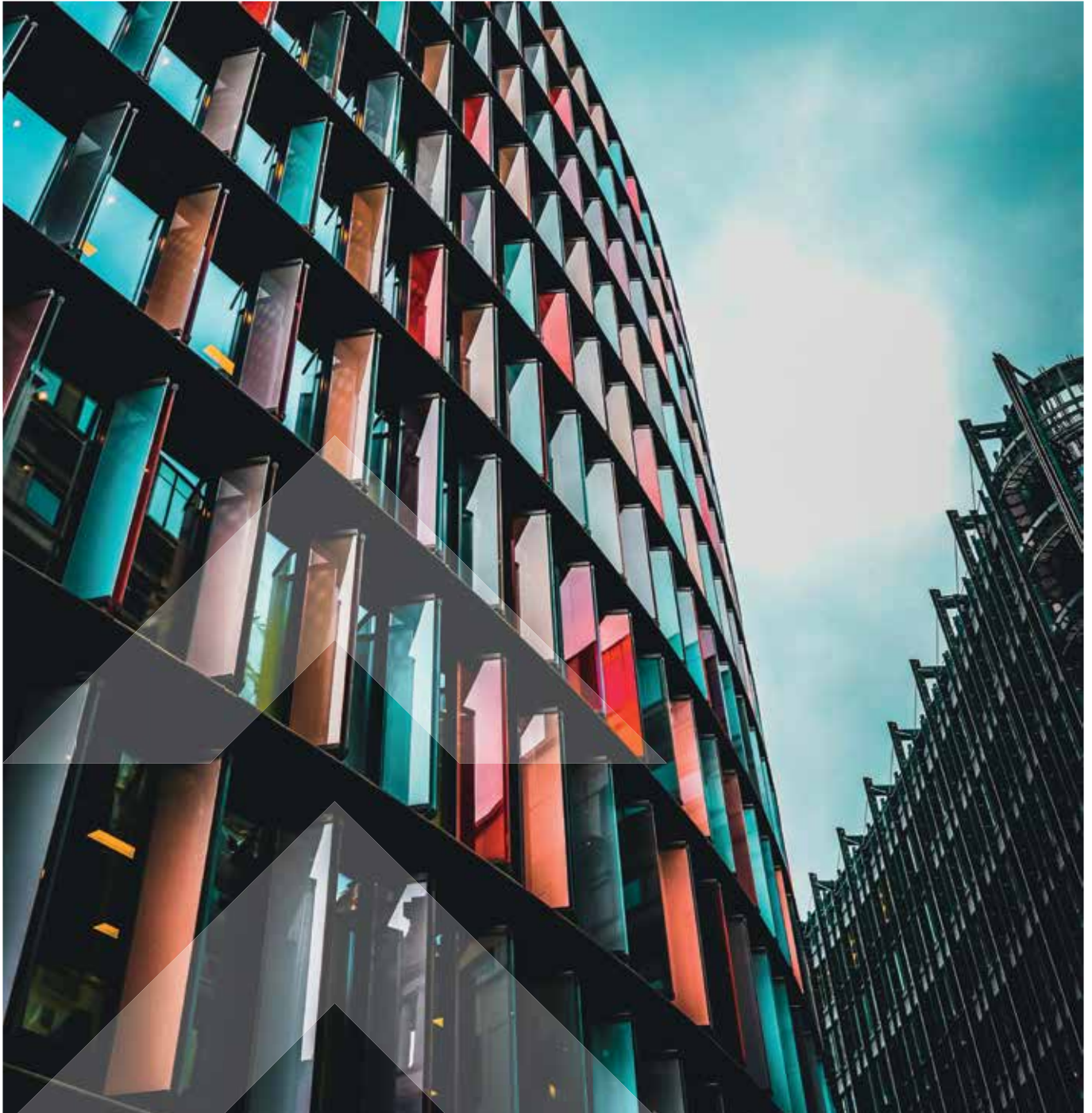


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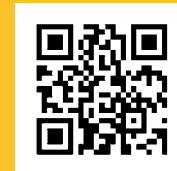


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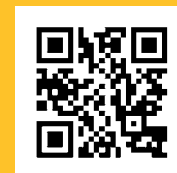
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HYWEL DAVIES

OVERVIEW



Welcome to the spring edition of Lift Industry News

It is a great pleasure to be the Guest Editor for this edition of Lift Industry News. As I prepare for life after CIBSE, after more than 25 years working for the Institution, it continues to be a time of unprecedented change in our sector. The Building Safety Act 2022 is the most far-reaching review of building and fire safety legislation since World War II and will affect all of us. You can read my summary on Page 32.

Len Halsey, a true industry veteran, gives his Point of View on the BSA on page 14, asking some challenging questions.

We also look at the much-debated topic of second staircases. Earlier this year Michael Gove released a statement on the government's long-term plans for housing including the provision of 'second staircases' in higher-risk buildings. My final column for the CIBSE Journal tackled this topic and it is reproduced on page 36. I am grateful to Rachel Smalley at Jacobs for her contribution from an inclusivity perspective on the topic, also reproduced by kind permission of the CIBSE Journal on page 38.

Just as this issue was being finalised, Mr Gove conveniently published the latest amendments to Approved Document B. This addresses the recommendation for a second stair in new HRBs as well as including specific provisions for the incorporation of evacuation lifts into HRBs in future.

There is also the final report of research into evacuation strategies, including the potential role of evacuation lifts.

I was delighted to speak about the BSA at the CIBSE Lifts Group AGM in February. Also discussed was the move from a CIBSE Group to a Division of CIBSE, or Society - you can learn more on page 31. Do send in any thoughts or comments to liftsgroup@cibse.org. CIBSE exists to deliver public benefit, and supporting the community of built environment professionals in the lift sector in their pursuit of excellence by becoming a Society can only be beneficial.

Societies and the BSA may be the future but the From the Archives article on page 18 looks at spectacular lift engineering from the past - water lifts! And we come bang up to date with news about the restoration project of the Folkestone Leas water lift on page 26.

I know that many readers of this magazine really do give a duck about lifts and you can read about Kirstie Horsler of Horsler Lifts on page 75 where ducks are a key feature of their great involvement with local charities.

Talking of charities, the spokesdog for the Lift Industry Mental Health Charity has rounded up some industry friends for this edition, follow Ted to page 70 and learn more about the benefits of animals to our mental health.

Plus we have updates from LEIA, news about LIFTEX in 2025, an interview with Ralph Smith at VerticA, Danny Garaway from Target Lifts gives his Elevator Pitch from his favourite lift in Las Vegas, John Bentley is back answering letters from the Pit and we have the first LIN Quiz, all about Stuck in a Lift.

And finally, I am delighted to have been invited to give the keynote speech at the Lift & Escalator Symposium September 18th-19th this year.

Registration is open here <https://bit.ly/3vlFvGQ> and I look forward to meeting many of you there.

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We focus on the Building Safety Act and the implications for the industry.



BUILDING SAFETY ACT

The Building Safety Act introduces the most radical change to the English regulatory landscape for the built environment in a generation. Needless to say, many of the changes have far-reaching consequences for construction clients. Hywel Davies from CIBSE explains it all!



INCLUSIVITY

Designing lifts for inclusivity involves considering the needs of a diverse range of users, including those with disabilities, sensory sensitivities, and varying mobility levels - we have two articles looking at this crucial area.

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CALENDAR 2024/25

April 30	CIBSE Lifts Group Annual Seminar April 30 GLASGOW, SCOTLAND  	June 26	CIBSE Lifts Group Annual Seminar June 26 MANCHESTER, UK  	October 01 - 02	E2 Forum October 1-2 FRANKFURT, GERMANY  
May 08 - 11	World Elevator & Escalator Expo May 8-11 SHANGHAI, CHINA  	September 16 - 18	The Elevator Show September 16-18 DUBAI, UAE  	October 28 - 30	Lift City Expo Saudi October 28-30 RIYADH, SAUDI ARABIA  
May 09 - 11	Inelex May 9-11 IZMIR, TURKEY  	September 18 - 19	Lift & Escalator Symposium (LES) September 18 - 19 KETTERING, UK  	LES 2024 Planning for the 15th Lift & Escalator Symposium is well underway. It brings together experts from the field of vertical transportation, offering opportunities for speakers to present peer reviewed papers on the subject of their research. Speakers include industry experts, academics and post graduate students. 15th Lift & Escalator Symposium is well underway. It will take place in a new venue, Kettering Park Hotel. Registration is open for delegates, early bird rate ends on 30th June. https://www.liftsymposium.org/	
June 14 - 16	Ascen.tec June 14-16 ATHENS, GREECE  	September 23 - 27	CTBUH International Conference 2024 October 16-20 LONDON, UK & PARIS, FRANCE   		

<p>12 November</p>	<p>Nordic Lift Expo November 12 STOCKHOLM, SWEDEN</p>  	<p>06 - 08 February</p>	<p>Lift City Expo 2025 February 6-8 CAIRO, EGYPT</p>  	<p>15 - 17 May</p>	<p>Asansör May 15-17 ISTANBUL, TURKEY</p>  
<p>13 - 14 November</p>	<p>Build2Perform November 13-14 LONDON, UK</p>  	<p>23 April</p>	<p>Elevator Forum April 23 MUNICH, GERMANY</p>  	<p>11 - 12 June</p>	<p>LIFTEX June 11-12 LONDON, UK</p>  
<p>04 - 06 December</p>	<p>Lift Expo Italia December 4-6 MILAN, ITALY</p>  	<p>14 - 17 October</p>	<p>Interlift October 14-17 NUREMBERG, GERMANY</p>  	<p>19 - 21 November</p>	<p>GEE Global Elevator November 19-21 MILAN, ITALY</p>  
<p>05 - 07 December</p>	<p>International Sourcing Exposition for Elevators and Escalators December 5-7 MUMBAI, INDIA</p>  	<p>06 November</p>	<p>Elevator Forum (Manchester) November 6 MANCHESTER, UK</p>  	<p>06 December</p>	<p>Elevator Forum (London) December 6 LONDON, UK</p>  

Celebrating

the life of

Peter Lycett



20th April 1968 – 22nd November 2023

A PERSONAL OBITUARY FROM DAVE COOPER



Peter worked in the lift industry from 1985 to 2022. He was very well known and at the funeral the number of those wishing to pay him respect was in excess of 200. Many, many of those were from our very own lift industry.

Peter served as an apprentice with Key Elevators. In the early days he worked as an engineer's mate to Gary Poynter and developed a natural understanding for refurbishment. The lift industry in 1985 was very different to our current established working environment. Peter and his supply side contemporaries defined the growth of the independent lift sector during the 80s and 90s. During the Independence Revolution, Peter enjoyed his work challenges completely. He was equally at home in the London life and the international travel that often took him away from his young family.



Peter was a dedicated family man and I recall him relishing the thought of getting home to see his daughters after those business trips. It is hard to imagine a more diverse group of people, all of whom who found Peter quite beguiling. Americans, Italians, French and Germans all seemed to laugh heartily whether in surprise – or more likely incomprehension – at Peter's often unorthodox theories. His humour wasn't wasted on us Brits either! On many occasions the laughter was in anticipation of what Peter would say or do next!

His ability to shock and simultaneously entertain have defined many of his friendships and professional dealings. However, this side of Peter was his exterior. Inside, he was kind, sensitive and very smart. As much as Peter both worked and played hard, he always had time for his friends – many of whom would talk to him about issues they were having both professionally and personally. He was very different on his own and many of us knew and valued him for that. It was normally only when an audience was involved that Peter's sense of excess mischief would come out, and he certainly knew how to hold an audience and keep them entertained!

Peter had a great love for ILE. As a second-generation owner, he worked for ILE with great pride for nearly 40 years. He was a mentor and a friend to many past and current colleagues. He was instrumental in the development of GAL VF door operator, and the Glaser brothers always credited him with the initial idea. He worked with Luciano Sorio to establish Prisma, and every day he championed the British lift industry. He believed that it was always possible to evolve to improve. He remained uniquely optimistic and eternally proud to be a lift man.

I had the very great pleasure to have Peter as a friend. God only knows what he is preparing in that great motor room in the sky. I await to find out with a mix of trepidation and anticipation. God bless you mate; may you rest in peace.

The Building Safety Act – A Major Change in the Approach to Compliance.

POINT OF VIEW

by Len Halsey

Few can be surprised that following the Grenfell tragedy the regulations, codes and standards applicable to safety in high rise residential buildings would come under very close scrutiny. This of course has been the case and as a direct result of the Grenfell enquiry the Building Safety Act (BSA) was introduced in April 2023.

The BSA is designed to improve safety standards and make dutyholders, those responsible for development, design, construction and ongoing maintenance management, directly responsible for the safety of the building and its residents.

The BSA represents a seismic shift in the approach taken to regulatory compliance of what is termed 'higher risk' residential buildings. Higher risk buildings are defined as being over 18m tall or above seven floors and in both cases having two or more residential units. The scope of the BSA is extensive and its implications will take time to fully understand and digest but it does represent a new and fundamental change to the culture of design, construction and management of tall residential buildings. With compliance being the central plank of the legislation, it aims to set out clear lines of responsibility and accountability to those dutyholders engaged in residential development.

A new Building Safety Regulator (BSR), working under the Health and Safety Executive, will be responsible for enforcing the BSA, bringing a new level of oversight for design with the added responsibility for final certification of new buildings before occupation. A key element of the BSA is the 'Golden Thread' which is aimed at ensuring residents feel safe and secure knowing that all information with respect to safety and compliance has been reviewed, and shared, between all relevant parties during the design and building of the project.

Electronic record keeping of design, construction and maintenance information will be the basis of the Golden Thread. It is intended that the Golden Thread will extend for the life of the building and become 'a building's single source of truth'.

While the regulations focus on new buildings, I'm sure that when it comes to modernising and upgrading existing stock, the framework and spirit of the Act will be used as a template and point of reference for 'good practice' in seeking to improve safety. In this respect it is interesting to see that as part of the BSA a 'residents engagement strategy' will have to be formulated, allowing residents to have a say in any changes to safety arrangements; no doubt the reliability of lifts, especially in public housing, will be a keen topic for discussion.

So, the BSA brings into sharp focus the key areas of applied building regulations, accountability and importantly, ongoing maintenance. Clearly this is a major shift in approach. However, the question must be: why it has taken a catastrophic incident like Grenfell to bring about such a change? Has it been that regulations haven't been properly enforced, or could it be that compliance to the regulations have been diluted to such an extent that they have become ineffective? Other causes may have been driven by precedent or perhaps a stretching of boundaries beyond their limits. Do those who make major design decisions possess the right levels of experience and competence? It is interesting that the BSA seeks to promote higher levels of competence and the regulator is encouraged to facilitate improvement for those involved.

As we know interpretation of regulations is always a keen area of debate and here precedent plays a major part in the decision making process. Could it be that we have all become somewhat complacent when it comes to compliance and that budgetary constraints drive much of the need to reach a solution? In such circumstances, who is responsible for the decisions? This, I feel, is one of the key drivers of the BSA as there is perhaps significant difficulty in establishing who is accountable and who takes responsibility when things go wrong. I'm sure many of us have experienced responsibility effectively being delegated, a 'that's their responsibility, they are the experts' approach to consultants and contractors are not unknown. It will be interesting to see what changes are made by dutyholders as the requirements of the BSA start to be fully understood and applied.

Whatever the causes of the situation before Grenfell, the BSA represents the biggest change in building regulations for decades. Aimed at bringing a major reset of thinking it seeks to clearly establish areas of responsibility and accountability for both the decision makers and the process.

While much of the BSA is focused on the building design itself, what are the implications for the installation and maintenance of lifts? Clearly compliance to applicable EN standards is something that should be covered by the manufacturer, design team, VT contractor and any insurance inspection bodies who may be involved. Even here we know from experience that limits have been pushed and it is sometimes a battle to get what would be considered an acceptable solution.

However, from a design perspective some key considerations would include the fire rating of landing entrances, the working environment of the lift and its interfaces to the building structure and other building services. Clearly there is a significant difference between lifts installed in luxury apartment blocks and those found in social housing, fitness for purpose should be a major consideration. In terms of building interfaces, the first to come to mind is fire stopping, particularly of landing entrances and shaft penetrations for wiring and containment. Who installs it and issues the necessary certification is of major importance and will need to be diligently monitored and recorded. The materials used in car finishes and the provision of low smoke zero halogen wiring and containment must surely become an area of attention in reducing the risk of fire and smoke inhalation within the car, shaft and machine rooms/spaces.

In addition, interfaces to other building systems such as fire alarms, emergency/secondary power supplies and communication are all crucial areas of focus. Add to this the operational functions such as firefighting and evacuation control and it is clear the levels of design, installation and testing will need careful checking and sign off as part of the 'Golden Thread'. Building design associated with items such as safe access to lifts, machine rooms/spaces and pits are all part of the wider aspects of lift installations and are important elements to be considered.

All of this falls back on building developers and owners who have to ensure the professional design team have the right qualifications and competencies to deliver a compliant design. This is then followed through and documented in the construction and commissioning phases of the project.

Ongoing maintenance is also a major factor covered within the BSA and it is here that good VT maintenance plays a major part in ensuring reliability and reducing risk. We are only too aware that maintenance standards are declining with something of a race to the bottom in terms of provision and cost.

The Internet of Things (IoT) offers some meaningful benefits with remote monitoring and reporting, but when it comes to the functionality of lifts in areas such as firefighting and evacuation service, I would suggest nothing beats a competent lift engineer thoroughly checking everything is working properly. This should extend beyond the operation of the lift to items such as escape hatches, shaft lighting and firefighting/evacuation communications; all vital components that require regular inspection and checks. Once completed all of these will need to be documented and recorded with any non-compliances addressed immediately.

While a competent lift engineer can carry out checks as part of regular maintenance visits it has to be recognised that these may be at extended intervals. This raises the question of who checks special operations on a regular basis? A trained and competent facilities operative perhaps? And how are these checks to be recorded; do you have a proforma check list to be ticked off on each inspection?

One further area that may be affected is the scope of the maintenance contract. Will the introduction of the BSA and Golden Thread mean that functional testing is now performed on every inspection? Will this become a feature of basic contracts? These I'm sure will become issues for discussion as the implications of the Act start to be understood.

Another area of consideration is the scope of LOLER inspections, something I discussed in an earlier article. Do you have a wider brief to encompass special operation verification as part of every LOLER visit? Perhaps another debate.

There are many questions at the moment but clearly things will need to change in meeting the requirements of the BCA, and while aimed at tall residential buildings, the principles and objectives will no doubt be reflected and used as a template in the world of commercial, retail and infrastructure projects.

The introduction of the BSA, the imminent London Plan and updated EN81-76 for evacuation lifts will bring major changes in a relatively short period of time. Individually and collectively, they represent significant step changes, all aimed at improving life safety in our buildings.

The main purpose of the Building Safety Act is to reshape culture, change practice, and bring design compliance and accountability. We should all perhaps reflect on the fact that the need for change has been driven by the terrible events of Grenfell.

BIOGRAPHY

Len spent a major part of his career with Otis holding senior technical and managerial positions in construction, modernisation and major projects before joining Canary Wharf Contractors in 1998. Working with vertical transportation contractors, consultants and interface trades Len was responsible for lift and escalator installations on major high rise developments before being appointed Vertical Transportation Design Manager in 2002.

Working with signature architects and major international VT consultancies Len worked providing design solutions in complex high rise buildings and across the developments portfolio, including infrastructure, retail, residential and public transport projects. He was appointed Project Executive for Vertical Transportation Systems in 2015 and fully retired from Canary Wharf in 2023. He is now an independent consultant.

He is a former chair of the CIBSE Lifts Group



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FROM THE ARCHIVES

The Four Remaining Water Balance Lifts in the UK

Dave Cooper looks back at energy efficient water lifts

In the Victorian and Edwardian eras a number of inclined water balance lifts were installed in the UK. Some of the heritage installations still survive in their water balance format and some have seen conversion to electric motors. As recent as 1991 a new one was installed in Wales and sees regular passenger service. This paper looks at the four water balance units remaining in the UK and compares the clever technologies that were used in their designs. The paper also looks at some of the converted installations which still remain including some which are important means of transport from one part of a town to another. All of the installations are different in their designs and the one thing that they have in common is that they are highly efficient when it comes to the energy they use.

1. INTRODUCTION

Two men were instrumental in the installation of inclined lifts around the UK's coastline. George Croydon Marks (Later Baron Marks of Woolwich) was the engineer and George Newnes was the financier having made his money setting up the "Country Life" series of magazines. The first installation of an inclined lift was at Scarborough in 1875 and they became synonymous with seaside towns such as Folkestone, Hastings, Torquay, Aberystwyth, Bournemouth, and Southend and so on. A few were installed inland but still in popular tourist towns such as Bridgnorth. In the early days some of the lifts were driven by water balance using the volume of water to create a weight differential between two carriages which were linked together. There are two words that have crept into use with these installations namely "lift" and "funicular" both of which are incorrectly used in this concept. They actually fall under the Cableway Installations Regulations 2004 and are "cableways" rather than lifts and the term "funicular" has become the standard way of describing an inclined system where two cabins are linked and one acts as a counterbalance to the other. In fact the term "funicular" technically means "of rope" and could apply to many things. Four water balance lifts remain in service in the UK at Lynton & Lynmouth, Folkestone Leas, Saltburn and Machynlleth. They operate in different ways and demonstrate a wealth of engineering ingenuity which is, of course, where the title engineer was derived from.

2. SALTBURN (1884)

Scarborough's popularity as a resort developed in the 1870s, at the time annual seaside holidays became a national custom. In 1875 the first inclined lift was installed and was a water balance type. It has since been modernised and is now a variable frequency type.

The success of these lifts in aiding tourists to get from the beach to their hotels above on the cliffs caused other seaside towns to consider installing one. Saltburn on Sea was one of those resorts and they ordered a gas engine, water pump and other items of engineering miscellanea from Tangye Engineering Company in Birmingham.

At the time George Croydon Marks was employed by the Tangye company which gained its status as one of leading engineering companies of the time when it assisted Brunel to launch his ship that was firmly stuck on its supports at Millwall – their marketing motto became "Brunel launched us and we launched Brunel!"

Originally Saltburn had a traditional vertical lift of timber construction. The cage could carry 20 passengers and was a traditional counterbalance type and entered service in July 1870.



The original vertical lift

The inclined lift replaced the vertical lift when it opened in June 1884. The track is 207 ft long and the rise is 120 ft. The original gauge was 3 ft 9 in but was relaid to 4 ft ¼ in in 1921. Each cabin has a rated load of 12 passengers and the triangular underframe under each cabin provides the housing for water tanks. In the 1950s the carriages were rebuilt to drawings reflecting the original design.



The original inclined lift

Upon arrival at the bottom station the lower car discharges its water which is pumped back up to the tank of the upper car. There are two water holding tanks the one at the bottom capable of holding 30,000 gallons and the one at the top 18,500 gallons.

The original pump was driven by a gas engine which was changed to a DC generator and motor in 1913 and changed again in the 1930s when it was connected to the mains electrical supply.



The lift in 2014

The water cycle for the Saltburn Lift is as follows:

- Cycle starts with water in the top tank (18,500 gallon capacity).
- Water is transferred from the top tank to the tank under the upper carriage.
- The system then overhauls with the heavier top carriage with its water lowering whilst the other car ascends.
- When the water laden carriage reaches the bottom the tank under it is emptied into a holding tank (30,000 gallon capacity).
- Pumps are used to transfer the water from the lower tank to the upper tank.

3. FOLKESTONE LEAS (1885)

Folkestone were not to be outdone! With little room left around the harbour area the building of houses and hotels continued to the west of the town on top of the cliffs but getting down to the harbour and seafront area was a problem for residents and holidaymakers alike. Similarly, getting back up the hill was not for the old, ill or faint hearted so when the idea of a pier was mooted in the early 1880s the time was right to search for a less arduous way of navigating the cliffs. Water balance lifts had already been built in Scarborough (1875) and Saltburn (1884) and appeared to be the solution. The Scarborough Lift still survives but has been converted to electric drive and the Saltburn Lift features elsewhere in this paper. The Folkestone Lift Company was formed and a lease was agreed with the land owner, Lord Radnor.

Reginald Pope, Architect, designed the installation and local builder John Newman constructed the stations. The stations were the first in the town to be constructed using

cavity walls which are now employed in the construction of most modern buildings. The lift equipment was provided by Waygood & Company and it opened for service on 21st September 1885.

The weight of water added to the top carriage was used to overcome the weight of the lower carriage and allowed the system to run. The two carriages were rated at 15 persons each and had the familiar triangular shaped water tanks mounted in the chassis.

The lift was an immediate success offering holidaymakers a comfortable ride from the new hotels on The Leas to the bathing facilities on the beach, the "switchback" and the new pier. It was, in fact, so successful that an additional lift, completed in 1890, was added. The second lift was steeper at 42° and as a result toast rack style cars were provided.

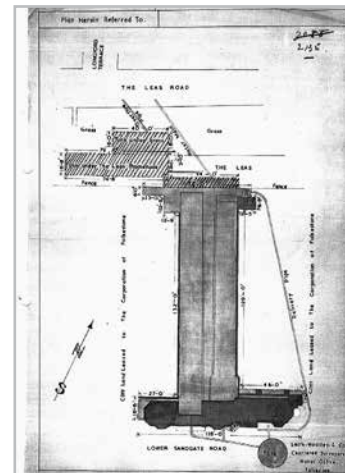
The original lift dumped its water onto the beach and proved very expensive for the owners because of the amount used. The addition of the second lift would have made matters worse and it was decided to use the water time and time again by installing a storage and pumping system. This required storage tanks at the bottom and top stations.



The pump room

In 1899 a second set of storage tanks were added to increase the amount of water that could be stored.

In about 1921 the Crossley gas engines that had driven the pumps for more than 30 years were replaced by electric motors and a band drive facility.



The lift closed during the 2nd World War and became a home guard post. A section of the pier opposite was also removed to prevent invading armies using it. The carriages were lowered to the bottom station thus rendering them useless as well. At the end of the war, years of neglect and abuse by the occupying military personnel had left the lifts in a poor state of repair and unusable. It was only a concerted effort by locals that saw the lift reopen in 1947 after a protracted wait for replacement motors which were in short supply at the end of the war.

The heydays of Folkestone had passed with the introduction of overseas package holidays and the 1890 lift carried its last passengers in October 1966. The real reason for the lift being withdrawn was because it had suffered damage following a hard landing and the 1885 lift could cope with the falling numbers of passengers. The lifts insurers though had different ideas and demanded expensive, major improvements that the lift company could not afford and Folkestone Borough Council offered to put up the money in return for taking over the business. As a result the Folkestone Lift Company was forced into liquidation and the lift was absorbed into the local council. In 1974 Shepway District Council took over Folkestone Borough Council and they continued to manage the lift until 2009 when they closed it for economic reasons.

The ownership of the lease reverted to the Folkestone Estate when the lease was surrendered and they carried out a major refurbishment of the lift before looking for a new team to operate it. A group of townspeople got together to form a community interest company and they still run the lift today.

The water cycle for the Folkestone lift is similar to the Saltburn cycle as follows:

- Cycle starts with water in the top tank under the Leas.
- Water is transferred from the top tank to the tank under the upper carriage.
- The system then overhauls with the heavier top carriage with its water lowering whilst the other car ascends.
- When the water laden carriage reaches the bottom the tank under it is emptied into a holding tank.
- A couple of times a day the pumps are used to transfer the water from the lower tank to the upper tank.

4. LYNTON & LYNMOUTH (1890)

The Lift at Lynton and Lynmouth is a very different design but still uses water ballast as its motive power.

The cliff railway was the second part of a scheme which involved Lynmouth Promenade, Pier and the lift itself.

The cliffs between Lynton at the top and Lynmouth at the bottom posed problems for the growing tourist industry. From the mid 1820s holiday makers began arriving at Lynmouth on paddle steamers from Bristol, Swansea and other Bristol Channel ports but a daunting hill faced those who wanted to walk up to Lynton.

Bob Jones, a local man and partner in the firm that built the esplanade recommended his sister's son, George Marks, to be the engineering advisor on the project to build the lift.

Marks realised that due to the length of the rails (some 900 ft) rising over 500 ft vertically at an incline of 1:1.75 that he would need to consider safety carefully and particularly the braking system which would need to be far more advanced than those used on its predecessors.

He decided on four separate systems. Two friction brakes which were steel blocks which push down on the crown of the rails by hydraulic pistons and hydraulic callipers which clamp across the crown of the rails. The system was patented by Marks and the hydraulic system used was filled with water and not oil which became unique to this lift.

The river Lyn, notable for the 1952 floods, would provide the motive power. The Lynmouth & Lynton Lift Company was formed by an Act of Parliament in 1888 which gave the company the perpetual right to extract up to 60,000

gallons of water a day from the River Lyn at the top of the hill. The water passes through a pipe under the road through the town and is held in tanks at the top of the hill adjacent to the top station



The Lynton & Lynmouth Lift in the 1950s

This lift is also different to the other water operated lifts in that space is limited and therefore the two carriages pass in a wide section in the middle of the traverse but spend the rest of their time above and below the passing point in narrower sections.

The water cycle for the Lynton & Lynmouth lift is very different to Saltburn & Folkestone and operates as follows:

- Cycle starts with the bottom carriage full of water and held static by the second brake and the diamond lock at the bottom station.



The Diamond Lock

- The top carriage tank is loaded with water (700 gallon capacity).
- When the carriages are ready to move the drivers communicate with each other by bell signals.

- The driver of the lower carriage releases the diamond lock and the calliper brake thus leaving the system hanging in suspense.
- The lower driver then releases some of the water from their carriage until the system overhauls.
- The overspeed governor automatically applies the brake if the carriages go too fast and it is up to the driver of the lower carriage to keep the speed of the system under the governor speed by using their foot brake to control the speed.

With the water being supplied by the River Lyn and merely being made useful on its way to its discharging into the sea via the lift rather than via the valley it can be seen that the system draws no power and can therefore be deemed as extremely environmentally friendly.

5. MACHYNLLETH (1992)

The Centre for Alternative Technology was a project before its time. It was the place where the idealism of the 1960s met the real world and fought the hard won battle to convince the latter of the virtues of concepts such as sustainable energy sources, energy conservation, organic farming and materials recycling which we readily accept today.

The inclined cliff railway here opened on Saturday 6th June 1992 having been built by the enthusiasts for energy conservation.

The water cycle for this lift is, yet again, different to the other three covered in this paper and operates as follows:

- Cycle starts when the operator at the top station is commanded to fill the top carriage tank as demonstrated below with the carriage away from the station for the benefit of the photo. The water is sourced from a lake at the upper level.



Water Chute

- As the water fills the top carriage tank the drum at the top wants to overhaul which is detected by a tilt switch.
- The top car starts to roll away with the bottom car naturally ascending as their ropes, albeit separate, are wrapped around the same drum.
- As the drum rotates it charges an accumulator via a hydraulic pump which is also used to maintain control of the speed.
- As the upper car arrives at the bottom the accumulator is used to power the extension of the hydraulic piston which released the water from the carriage that has just arrived at the bottom station.

The water for the operation of the lift comes from a natural lake supplied by rainwater and the system only draws minimal power using a car battery to maintain lighting and switches at the operators console. The movement of the carriages is all down to gravity and costs nothing to operate.

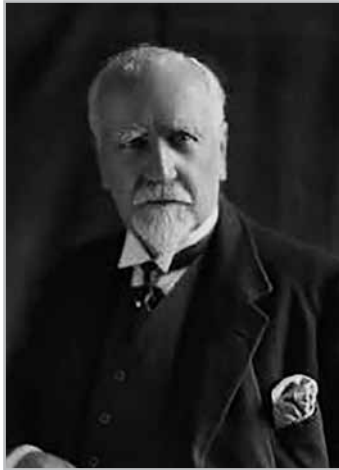


Water being released at the bottom station

6. GEORGE CROYDON MARKS

George Croydon Marks was born on 6th June 1858, the eldest of eight children of which only four survived infancy and followed his father into the Arsenal at Woolwich where he undertook an apprenticeship. At school he had impressed his teachers with his academic ability and it was suggested that he attempt the Whitworth scholarship which he passed and attended Kings College in London, achieving a Degree.

At a reasonably young age he became the manager of the hydraulic and lift department of the Birmingham based Tangye Brothers, a company associated with funicular lifts, and was placed in charge of the installation of the funicular at Saltburn. It was here that he met Dugald Clerk, inventor of the two stroke combustion engine, who was to become his business partner.



George Croydon Marks

In 1880 he set up in private practice in Birmingham and married Margaret Maynard a year later.

In 1882 (but some reports say 1887) at the age of 29, he set up in private practice as a consulting engineer and was soon joined by Dugald Clerk in the London based patent agency Marks Clerk which still trades today and has offices all round the world.

George's mother was originally from Lynton and had maintained contact with her relatives there, so once the idea of the Lynton railway became a reality, George was brought in to carry out its design. In Lynton he met with George Newnes and each had a profound impact in each other's lives.

Following the opening of the Lynton and Lynmouth funicular, Newnes and Marks worked together on a number of funicular installations; Saltburn, in 1892 Bridgnorth, 1893 Bristol Clifton and in 1895 Aberystwyth.

In 1906 he was elected Liberal MP for Launceston & North Cornwall In 1910 he opened a New York office with Thomas Edison.

In 1911 he was knighted followed by a CBE in 1918. After being elected into the Houses of Parliament he crossed the floor of the house to join the Labour party under the leadership of Ramsay McDonald.

In 1929 he was elevated to the peerage and became Baron Marks of Woolwich which was one of the first two Labour peerages

During his life he was a Director of two record companies, Columbia and EMI, and could be described as the Richard Branson of his time. He passed way in Bournemouth on 24th September 1938 whereupon the peerage became extinct.

7. GEORGE NEWNES

Newnes was a man of distinction; born on 13th March 1851, in Bakewell, Derbyshire he was the youngest of 6 children. The son of a congregational minister, he was expected to follow his father into the ministry and he was educated in a boarding school where he received preparation for this. He had his own ideas and on leaving school he joined a London firm of accountants as a trainee and later took over their Manchester office. In 1881 he launched the journal "Tit Bits" which was to supply his future funding for some of his projects. It was the success of this magazine that brought him back to London.

In 1885 he was elected as Liberal MP for Newmarket.

The popularity of his publications enabled him to spend the winter in places such as Torquay. In 1887 he was persuaded by Thomas Hewitt, a business man from Lynton, to change his plans and he wintered in Lynton and fell in love with this north Devon town. Here he funded the installation of the water balance funicular lift which still exists today.

In 1890, the same year as proposing a cliff lift at Babbacombe, he teamed up with George Croydon Marks, later Baron Marks of Woolwich, who was to be the consultant on the eventual installation at Babbacombe.

In 1895 he lost his Newmarket seat and was given a Baronetcy. In 1897 he started the now renowned journal "Country Life".

In 1900 he was elected MP for the Swansea Town seat although some reports say this was 1906.



George Newnes

He died in 1910 and was buried in Lynton. He never got to see the realisation of his proposal of a cliff lift at Babbacombe although he had his hand in on many cliff railways around the UK including Bridgnorth and Lynton & Lynmouth.

8. THE HISTORY OF WATER BALANCE INCLINED LIFTS IN THE UK

The following water balanced inclined lifts were installed in the UK

Date	Location	Gauge	Length	Angle	Notes
1875	Scarborough (Spa)	4 ft 8 ½ in	284 ft	30°	Converted to electric
1878	Scarborough (Queens)	4 ft	218 ft	27°	Withdrawn 1887
1884	Saltburn	3 ft 9 in	207 ft	30°	Still in service
1885	Folkestone Leas	5 ft 10 in	164 ft	32°	Still in service
1890	Folkestone Leas (2)	5 ft	155 ft	34°	Withdrawn 1966
1890	Lynton & Lynmouth	3 ft 8 in	862 ft	30°	Still in service
1890	Laxey	5 ft	300 ft	14°	Withdrawn 1914
1892	Bridgnorth	3 ft 8 ½ in	201 ft	29°	Converted to electric
1893	Bristol	3 ft 8 in	450 ft	22°	Withdrawn 1934
1893	Folkestone (Sandgate)	5 ft 6 in	670 ft	12°	Withdrawn 1918
1896	Aberystwyth	4 ft 10 in	798 ft	27°	Converted to electric
1903	Hastings (East Hill)	5 ft	267 ft	38°	Converted to electric
1904	Folkestone (Metropole)	5 ft 6 in	96 ft	36°	Withdrawn 1940
1992	Machynlleth	5 ft 3 in	197 ft	29°	Still in service

9. CONCLUSION

14 water balance inclined lifts were installed in the UK of which only 4 remain at Saltburn, Folkestone, Lynton & Lynmouth and Machynlleth.

Whilst the 4 remaining inclined lifts have different modus operandi they all have two things in common – they use water as the prime mover and they are incredibly efficient when it comes to energy consumption.

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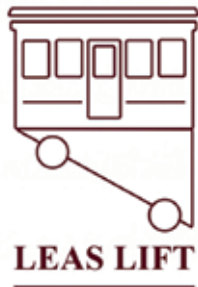
BIOGRAPHY

David Cooper has been in the lift industry since 1980 when he started an apprenticeship with British Railways. He has been involved with many of the rail mounted inclined lifts around the UK including Hastings East, Hastings West, Babbacombe, Scarborough Central, Scarborough South Cliff, Scarborough St Nicholas, Padstow, Lizard, Southend, Urbis Centre, Machynlleth, Bridgnorth.

Internationally he has also been involved with the Angels Flight inclined lift in Los Angeles. In 2008 he appeared in the BBC programme "Flog It" as the expert showing Paul Martin over the Inclined Lift at Babbacombe in Devon. He has won awards for his involvement with inclined lifts including the Association for Consulting and Engineering Awards for the projects at Babbacombe and Hastings.

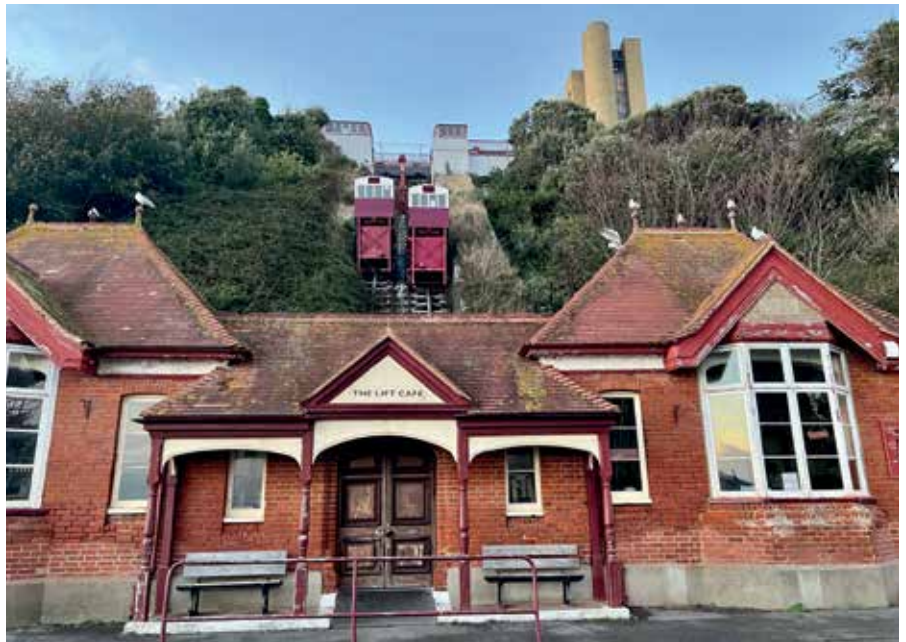
He has also been involved with aerial suspended cableways and was the winning project in the Elevator World Project of the Year in 2013 for the London Emirates Airline Cable Car on which he presented a paper at the 2013 Symposium.





THE LEAS LIFT REVIVAL – RESTORING AN ICONIC LOCAL KENT LANDMARK TO ITS FORMER GLORY

Having carried over 36.4 million passengers between the seafront and promenade since 1885, Leas Lift in Folkestone, Kent is an icon of local history. It's one of the oldest water lifts in the UK, is Grade II* listed and was placed on Historic England's Heritage at Risk Register in 2019.



One of only eight water balance cliff lifts in the country, it still operates using its original engineering system which includes its 1890 reciprocating pumps. It also has the only working band brake in a funicular railway worldwide. Having closed in 2016, restoration work is now set to start, with a view to reopening in 2025. With so much support and a fascinating story, we caught up with Ed Wealend, Vice Chair of the Board of Trustees.

THE JOURNEY TO REINSTATE A CHERISHED LIFT

A volunteer group came together as a Community Interest Company (CIC) in 2017, and in 2022 the Folkestone Leas Lift Charitable Incorporated Organisation (CIO) was created to save this nationally significant heritage asset. The group were looking to raise funds for complete restoration to bring the lift back into use, benefiting the whole community.

"The lift is a much-loved community feature, and we were determined to restore it to its former glory. We carried out a consultation in 2020 which told us that many people in our community now struggle to walk up the footpaths that connect the coastal path to the top of the Leas, whether due to ill health, disability or the little legs of children! So this project became not just about saving a piece of history,

but providing much-needed transport to allow our whole community to take full advantage of our beautiful surroundings."

With a significant £6.6 million target to achieve this transformational project to repair and conserve Leas Lift, there has been a lot of work to raise funds, and the Folkestone Leas Lift CIO has been working hard to hit their goal.

"We have had so much local support for the project which has allowed us to take some huge steps forward. We were successful with a bid to the National Lottery Heritage Fund, which secured us £4.8 million. The remaining £1.8 million has come from Section 106 funding, donations from Trusts and Foundations, and we've been incredibly fortunate to have the support of the community, with local companies and individuals adding £136,000 to our total."



Plans are now coming to fruition, with a lengthy schedule of works to keep to. Work will include the restoration of the lift cars, waiting rooms, pump rooms, tanks, track, wheel houses and upper station tunnel and railways, as well as creating welcoming waiting spaces, ticket office, information desk, outdoor seating and WCs. Accessibility is also a major focus, with step free access a priority. The lower station pump room and both cars will be brought up to modern accessibility standards. A programme of activities to educate and engage with the local community is also an important part of the lift's future.

"We're determined to make Leas Lift a focal point of our community, and with this in mind, our restoration plans include an extension to our site to provide a space for a café and events. We're looking to create a viable business, which we hope will attract people to the area and will create permanent jobs, work experience and placement opportunities for young people as well. We want to engage with the whole community, and for Leas Lift to be friendly and welcoming to all, a hub of the community and providing a real asset to their lives."

Popular in the Victorian era, Leas Lift operated for over 130 years, before closing in 2016. By its nature, the lift has a low environmental impact, using water and gravity to operate. The team is keen to continue this theme throughout the restoration and beyond, with sustainable options for sourcing the electricity needed to pump the water to the top.

"We're acutely aware of the sustainable nature of the lift, and are keen to minimise our carbon footprint when bringing it back into service. With this in mind, we're installing an air source heat pump, insulation and secondary glazing where possible, photovoltaic (PV) panels and LED lighting. We're keen to improve the energy efficiency of the lift, and once complete, it will be powered by super-efficient pumps driven by electricity from the PV panels. Operating using water and gravity, it will be a near net zero carbon building, recycling all the water it uses to drive the cars. Sustainability is being built in."

At the heart of Folkestone, the Leas Lift restoration has seen an outpouring of local support, with plans created around the needs of the community and ongoing engagement with a dedicated officer to run exhibitions, events and activities. Work is scheduled to start in summer 2024, taking just under a year to complete.

"Our aim is to give Folkestone back their beloved Leas Lift in full working order – and better than ever! Our vision is that it becomes an unmissable attraction for visitors, offers an accessible transport option from the Leas to the beach, as well as providing a space for our entire community to enjoy."

If you'd like to find out more about **Leas Lift**, or contribute to the ongoing management of the project, visit leaslift.co.uk.

FIRST CEO APPOINTED AT THE LEAS LIFT

Folkestone's Leas Lift has appointed its first chief executive officer, charged with leading the restoration and re-opening of the nationally significant heritage asset.

Floortje Hoette, who currently leads Produced in Kent, will join Folkestone Leas Lift Company Charity on 1 May 2024.

With more than 25 years' project management experience in the not-for-profit and commercial sectors, Floortje is well positioned to lead the team working to re-open the lift in 2025.





BEHIND THE SCENES AT LEIA

LEIA Member seminars:

BS7255 Code of Practice on Safe Working Lifts - 25th April

LEIA Safety Seminar - 26th Sept

LEIA Technical Seminar - 23rd Oct

Date for your diary

The distance learning cut-off for the September cohort is **15th August**.

LEIA Assessment

Karen Slade, Head of End-Point Assessment

It has been a busy first quarter for our team as we welcomed the first Lifting Equipment Technician Apprentices through for EPA. The first Stairlift, Platform Lift and Service Lift Electromechanics have started their EPA too.



"It is confidence-boosting and inspiring to know that my company is still investing in my education after my apprenticeship. There are a wide range of courses available within the industry to gain more knowledge, which will propel me on my path to becoming a highly competent and well-rounded employee."

Congratulations to all those who passed through and good luck with your future endeavours.

In other news, the Government has published a new End-point Assessment guide for apprentices. It details what apprentices can expect from their end-point assessment, how to prepare, and advises on results and next steps. It's available from the Gov website under publications. We've also got guides over on our LEIA Assessment site (www.leia-assessment.co.uk).

LIFTEX 2025

Event Director, Oliver Greening

LIFTEX 2025 officially launched in February, and we've been overwhelmed with the positive response. 65% of floor space was booked within the first two weeks, and we have since expanded the show. The event team is now busy planning our marketing activity and looking forward to June 2025 (see page 30 for more details on LIFTEX 2025).



As part of National Apprenticeship Week, we highlighted past apprentice Harry Harris, having completed his Lift Technology NVQ and the first apprentice to pass the LEIA Assessment gateway from Otis back in 2021. He told us,

"I found the process exciting and a great opportunity to show off the knowledge I had gained during my apprenticeship. It was a great way of confirming that I was ready to be on my own jobs as a fully competent lift engineer. It gave me a real confidence going into my first solo jobs."

He's now taking the next steps to further his career by enrolling in another course provided by Otis (via LEIA).

Training and development

Nick Mellor, MD at LEIA

Reminder: End of CSCS cards through Industry Accreditation (IA) by the end of 2024

As a reminder, all renewed CSCS cards through Industry Accreditation will expire on 31 December 2024 and CSCS will no longer renew IA cards after 30 June 2024. This follows the announcement by the Construction Skills Certification Scheme (CSCS) in 2019 that it was withdrawing the Industry Accreditation (IA) route for CSCS cards. IA, or 'grandfather rights', enabled employers of experienced and competent operatives without formal qualifications, to certify the competence of their staff and enable them to apply for a CSCS card.

We advise any remaining people with a CSCS card through Industry Accreditation who will still need a CSCS card to look at other routes to obtaining a CSCS card (such as starting on one of the relevant NVQs, or Level 2 Certificate below). Statements and guidance from the Construction Leadership Council (CLC) can be found at CLC Industry Accreditation and from Construction Skills Certification Scheme (CSCS) can be found at CSCS Industry Accreditation.

Level 2 Certificate in Lift and Escalator Support Services

This qualification was developed to provide a route for those carrying out various support services and who would not need the full L3 NVQ to demonstrate their competence. The Level 2 EAL Certificate in Lift and Escalator Support Services is recognised by CSCS as a valid qualification to obtain a Skilled Worker (Blue) card following CSCS withdrawal of the Construction Related Occupation (CRO) card.

The EAL Level 2 Certificate in Lift and Escalator Support Services qualification is available for registration through the LEIA training provider network. It has been designed to allow workers in relevant disciplines to be suitably assessed and prove competence. The Level 2 Certificate is not applicable for lift and escalator installation and maintenance people who should be looking at the Level 3 NVQ.

The qualification requires five units to be completed in total (three of which are mandatory). The total qualification time is recorded as 170 hours of study and evidence collection for assessment. LEIA anticipates that this could be completed in a six month period (provided the learner has access to collect evidence and undertakes the work to produce the portfolio).

The disciplines include:

- Fitting and updating electrical and electronic systems
- Strip and fit-out
- Carrying out building work
- Erecting and assembling prefabricated steelwork
- Applying surface treatments
- Removal and dismantling of lifts and escalators
- Installation, removal and replacement of ropes
- Installation, removal and replacement of equipment
- Installing and testing protective materials
- Site co-ordination

BS 7255:2023 Safe working on lifts

The code of practice was published in November 2023 and includes clause 4.6 on training and competence. Clause 4.6.1 recommends that all persons working on a lift or related equipment, including within a lift well (including the pit), machinery space, pulley room or lift lobby, or carrying out risk assessments, should possess demonstrable competence in basic lift safety and procedures or be under relevant supervision; and refers to the industry guidance for suitable qualifications:

"Guidance on suitable basic levels of certified competence for various types of workers can be found at www.leia.co.uk/industry-qualifications".

This industry guidance lists suitable qualifications for the following categories addressed in BS 7255:2023 and in this document. Details can be found in the LEIA news item from March 2023 and at the Industry Qualifications page on the LEIA website which is the landing page for links from the training and competence clause in BS 7255:2023.

Anyone doing lift installation, maintenance or repair should also meet BS 7255:2023, 4.6.3 and those doing testing work should also meet BS 7255:2023, 4.6.5. For each of these, suitable basic levels of certified competence can be found at the Industry Qualifications page on the LEIA website.

Visit www.leia.co.uk for more information on everything highlighted in this article.

Exhibition bookings are now open for LIFTEX 2025 when it returns to London's ExCeL from 11 – 12 June 2025.

Now in its 37th year, the tri-annual event has received strong backing from LEIA members.

Confirmed exhibitors include:

- A & A Electrical Distributors
- Alimak
- Digital Advanced Control
- Gartec
- Global1Partners
- International Lift Equipment
- Jackson Lift Group
- Kollmorgen UK
- Lester Control Systems
- Murray Lift Group
- NDC Elevator Drives
- Sassi Lift Systems
- Shorts
- Taylor Lifts
- Thames Valley Controls
- TK Elevator

The 2022 event was the most successful yet, as Show Director, Oliver Greening explains, "Our 2022 event broke all records, attracting over 4,000 attendees, which was a 22% increase in visitors. We welcomed over 100 exhibitors from 12 different countries including the UK, Croatia, Germany, Italy, Spain, Sweden, Switzerland and the USA. The feedback was that LIFTEX plays an essential role in supporting the UK's lift and escalator industry, so we're delighted to launch the latest event with such strong backing from LEIA members."

The popular free seminar programme will run alongside the exhibition once again. Featuring presentations from industry experts, the 2025 programme will focus on themes including building safety, standards, regulations and evacuation.

LIFTEX 2025 LAUNCHES WITH THE BACKING OF LEIA MEMBERS

5 REASONS TO EXHIBIT AT LIFTEX 2025:

1. No other UK event brings together so many key decision-makers in the lift and escalator industry in just two days.
2. A unique opportunity to launch new products and services to the industry.
3. Designed to help you generate new business for the next three years.
4. Unrivalled networking opportunities with UK and global peers.
5. Designed and run for the industry, by the industry.



A LOOK BACK AT 2022

- 71% of exhibitors expected to take an order as a direct result of LIFTEX*
- 88% indicated they would attend LIFTEX again*
- 94% rated LIFTEX as "Excellent", "Very good" & "Good"
- £7.2m of orders taken, or expected within 12 months as a result of attending*

*Source: LIFTEX 2022 exhibitor survey.

To join the LIFTEX 2025 exhibitor line-up please visit www.liftexshow.com or contact **Stephen Ingram** at stephen.ingram@liftexshow.com





NEWS FROM THE CIBSE LIFTS GROUP

The Officers for 2024 are:

Chair - Michael Bottomley

Vice Chair - Phil Pearson

Secretary - Wee Chuan Lim

Treasurer - Richard Peters

The Committee Positions

for 2024 are:

Events Organiser (North and South)

- Phil Pearson / Erkan Soydan

BSi Representative - Adam Scott

Event Exhibition - John Bashford

Training Development –

David Cooper

SAFED Representative -

Jonathan Bracken

Press and Publicity - Paul Clements

LEIA Representative - Nick Mellor

University of Northampton

Representative -

Stefan Kaczmarczyk

INITA Representative - Vince Sharpe

International Representative USA

- Rory Smith

International Representative AU -

John Carroll

The CIBSE AGM was held on 21 February at CIBSE HQ in Balham. A full conference room demonstrated the strong support and interest by our members.

Following Michael Bottomley's Welcome and tribute to the late Dr Gina Barney, CIBSE President, Adrian Catchpole took the opportunity to address the attendees, stressing the value of the special interest groups within CIBSE.

The Society of Vertical Transportation?

Michael then provided an update on the efforts behind transitioning the group to a society. CIBSE societies represent key specialisms of the building services industry, offering professional recognition to their members and supporting the science, art and practice of their field. Two examples are the Society of Light and Lighting (SLL) and the Society of Façade Engineering (SFE).

Becoming the Society of Vertical Transportation (SVT) would give recognition to those working in the industry with accreditations entirely specific to the lift industry.

The intention is to start the transition to a society through 2024, hopefully this will be completed at the launch of CIBSE Guide D 2025. **Please do email suggestions and/or concerns to: liftsgroup@cibse.org**

Codes and Standards

Adam Scott shared updates on the development of codes and standards, his slides can be viewed here <https://bit.ly/3lycniu>

Education Training and CPD

Dave Cooper reminded the attendees of the various knowledge sharing and education initiatives available and that CIBSE will be creating an online continuous, professional development

(CPD) specifically for the Vertical Transportation industry.

- Learning Portal
- Lift and Escalator Library
- Lift and Escalator Symposium
- TSIB

Phil Pearson then kicked off the afternoon seminar where Hywel Davies provided some great insights into the "Building Safety Act 2022" which was followed by an intense Q&A session.

Read Hywel's incisive overview of the BSA on the following pages.

Do visit the CLG website for a recording and copy of Hywel's presentation <https://bit.ly/48RBvvl>

FOLLOW us on 



Keep up to date on our web site



THE BUILDING SAFETY ACT

The Building Safety Act introduces the most radical change to the English regulatory landscape for the built environment in a generation. Needless to say, many of the changes have far-reaching consequences for construction clients.



It is almost two years since the ***Building Safety Act 2022*** received Royal Assent and became law. Introduced in response to the Grenfell Tower tragedy and Dame Judith Hackitt's report on Building Regulations and Fire Safety, it is the most fundamental reform of regulation of the construction and residential property sectors since the Second World War.

The Act itself is a major piece of law, it makes significant amendments to the Building Act 1984 and Building Regulations 2010 and it is supported by more than 20 pieces of secondary legislation. It is a complicated piece of work. The whole package is intended to create a regulatory system in which residents of apartments are safer and feel safer in their homes. It is not an unreasonable ambition but requires rebuilding of trust in the construction sector.

Although a response to the tragic loss of life in the Grenfell Tower apartment block, the Act transforms the law relating to design and construction of all buildings and introduces a new regime for the operation and management of higher risk residential buildings. It will therefore have a significant impact on the work of the lift industry, in the following ways.

The Act creates a Building Safety Regulator, responsible for the regulation of ALL buildings. And the Regulator is also the Building Control Body for all Higher Risk Buildings (HRBs). These are buildings over 18 metres in height, or seven storeys or more, which contain two or more residential units, a care home or a hospital. Whilst the hospitals and care homes are only HRBs whilst being constructed or undergoing controlled building work, residential buildings are HRBs for their entire operating life and are regulated in operation and use.

The Act creates a new and more rigorous regime for the planning, design, construction and operation of HRBs, with new planning and building control gateways, accountable persons, safety cases and a statutory 'Golden Thread' of information, all linked to a formal certification of the building by the regulator for fitness to occupy.

The Act enables the introduction of new regulations covering the competence of all those who undertake building work with new statutory roles for designers and contractors on all projects. These are implemented through the introduction of the new Part 2A of the Building Regulations 2010.

This will have implications for the design and specification of lifts and the provision of information about the installation as part of both design process and the Golden Thread. It will also have implications whenever work is carried out on lifts in HRBs, with a need to update the Golden Thread with details of the work carried out.

The new regime will lead to a much greater focus on the interface between the regulatory regime for lifts under machinery legislation, the workplace regulations and BS EN81 and the Building Regulations. This will be most obvious in relation to lift lobby doors, which form a key element of the compartmentation of the core as well as providing the means of access to the cars and preventing access to the shaft.

There is almost certainly an interface here between competence requirements specific to the lift sector and the competence requirements in relation to building regulations.

Beyond HRBs the Act introduces major changes to the regulation of ALL controlled building work, with statutory registration of all building control inspectors and changes to the Building Control processes for all work limiting the use of initial notices.

This will in turn drive a change in the culture of the building control profession. They are now a regulated profession and will be expected to behave as a regulator. They are not advisers to the design or construction teams: the days of asking the building inspector how to do something are gone. They are there to mark the homework, not to do it. This will in turn have implications for designers. Where there is a debate or disagreement about what compliance looks like, it may be necessary to get the advice of a building control practitioner, who does not need to be registered but does need to understand the system.

When the design team take the design to the regulator, the regulator will expect them to be able to set out the specific functional requirements from Schedule 1 of the building regulations and then set out how they, the design team, consider that their design meets those requirements. The regulator will want to see the evidence for the claims of compliance and understand the thinking behind them. They may be interested to know what guidance has been followed, but ultimately their concern will be that the functional requirements are met.

And as noted elsewhere in this issue (see the articles on Means of Escape on page 36 and Second Staircases and Evacuation Lifts on page 38) this will be particularly true of the requirements for appropriate means of escape and adequate means of firefighting access. The Approved Documents contain useful and relevant information on compliance, but they are written for "common building types". The taller an HRB the harder it will be to justify the claim that it is a "common" building type. And of course for hospitals there are some very specific requirements for the lifts and the Health Technical Memoranda apply.

It is important to recognise that this is a new regime. A new Regulator, new building control regime and a new system for regulating Higher Risk Buildings. There are a good many known unknowns here, where we know there are new requirements, but we don't know how they will play out. And of course, we don't know what the unknown unknowns or unintended consequences might look like. It will take time for the new regime to bed down, for the new regulator to become established and for examples of the new system in practice to emerge.

Find out more

<https://www.cibse.org/policy-insight/key-policy-areas/building-safety-act>

CIBSE are running online courses every month except August
<https://www.cibse.org/training/search-building-services-engineering-training-courses/introduction-to-the-building-safety-act>

BIOGRAPHY

Dr Hywel Davies CChem CSci HonFCIBSE has recently retired as Chief Technical Officer from CIBSE after more than 25 years working for the Institution. He was CIBSE's technical director from 2007 until September 2023, after 10 years at the Building Research Establishment and 10 years as an independent consultant. He was awarded an Honorary Fellowship by CIBSE in 2023 – the first to be given to a serving member of staff. He led the government's expert group responsible for reviewing the use and structure of Approved Documents following the Grenfell Tower tragedy and led CIBSE's Covid-19 pandemic response. He has been an active author of and contributor to British, European and International Standards for over 30 years. He was the last chair of the Building Regulations Advisory Committee and is a member of the Building Safety Regulator's Building Advisory Committee, where he now serves in an independent capacity.



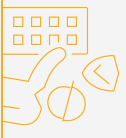
Building Safety

A summary of the key points and definitions covered in or impacted by the Building Safety Act and the new Building Safety Regulator.

Register for the CIBSE training on the Building Safety Act



BUILDING SAFETY REGULATOR



Operating within the Health and Safety Executive to oversee ALL building work that requires building control approval, setting standards, enforcement of building regulations (through local authorities), setting competency requirements and establishing duty holder roles.

[Learn more](#)

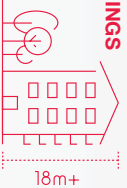
BUILDING SAFETY ACT



The Act is a major revision and reform to the Building Act 1984. The Act creates a Building Safety Regulator, responsible for the regulation of ALL buildings, with new statutory roles for designers and contractors on all projects and regulation of building control officers.

[Learn more](#)

HIGHER RISK BUILDINGS OR BUILDINGS IN SCOPE (of the new Building Safety Regime)



The Act does not exclusively refer to higher risk buildings. However, the new regime introduced by the Building Safety Act includes a strengthened regulatory regime for higher risk buildings, improving accountability, risk-management and assurance.

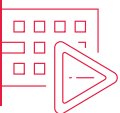
[Learn more](#)

KEY

- All Buildings
- Higher-Risk Buildings

Points Relating to Higher-Risk Buildings

HIGHER RISK BUILDINGS



- At least 18 metres in height or has at least 7 storeys
- Contains at least 2 residential units, as well as hospitals and care homes above the height threshold in design and construction
- Residential Higher Risk Buildings will be subject to safety case processes and regular safety case reports, needing to be reapproved for occupation regularly.

[Learn more](#)

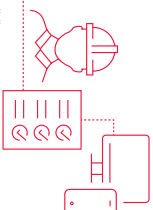
ACCOUNTABLE PERSON



- All occupied higher risk residential buildings will be required to have an Accountable Person, who will be legally responsible for ensuring that the fire and structural safety of their building(s) are being properly managed.
- The Accountable Person must identify themselves to the Building Safety Regulator before a higher-risk residential building is occupied.

[Learn more](#)

THE GOLDEN THREAD

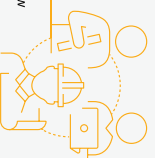


Designed to be a tool for building owners to manage and operate higher risk residential buildings safely. Requirements relate to the management, recording and accessibility of information about a building that allows someone to understand the building and keep it safe. It also refers to how this information is managed, ensuring that it is accurate, up to date, secure, clear and accessible to those who need it.

[Learn more](#)

Points Relating to Duty Holders

DUTY HOLDERS



The Building Safety Act introduces new regulations that place duties on those who procure, plan, manage and undertake building work of any kind. Duty holders will need to work together to plan, manage and monitor the design work and the building work, ensure they cooperate and communicate with each other, coordinate work and have systems in place to ensure that all building and design work complies with all relevant building regulations.

[Learn more](#)

CLIENT

The person for whom the work is being done (often the developer or building owner). They will have new statutory duties to take all reasonable steps to assure themselves that those they appoint to work on a project are competent to do that work.

PRINCIPAL CONTRACTOR

A contractor appointed to be in control of the whole project during the construction phase.

PRINCIPAL DESIGNER

Appointed to be in control of ALL design work.



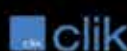
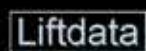
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MEANS OF ESCAPE

In July last year, the government announced that it expected residential buildings higher than 18m to contain a second staircase. Further details were set out last month. Hywel Davies explores the latest statement.



On 19 February, Michael Gove, Secretary of State for Levelling Up, Housing and Communities, released a statement¹ on the government's long-term plans for housing. It included four paragraphs on the provision of 'second staircases' in higher-risk buildings – namely, residential blocks above 18m in height. It also refers to evacuation lifts.

One factor that contributed to the tragic loss of life in the Grenfell Tower fire was that the single stair core became unusable as a means of escape because of smoke. There has been debate about the need for a second means of escape ever since.

Second staircases were consulted on in December 2022. A further speech committed to an 18m threshold in July 2023 and the latest statement follows speculation about the detailed policy.

Gove has stated that 'the Building Safety Regulator (BSR) will publish the new guidance on second staircases before April, making clear the need for a second staircase in new multi-occupancy residential buildings that have a top occupied storey above 18m, and confirming that evacuation lifts will not be called for as a matter of course, providing housebuilders with the clarity they need to progress developments'.

What does that actually mean for developers? It does not change their responsibility for the safety of their building. Government and the BSR are very clear that a developer applying for approval of full plans for a new residential building must show why they think the building will be safe to occupy. We must also be clear that there is no such thing as absolute safety. Second means of escape, sprinklers, evacuation lifts, even compartmentation and fire stopping may reduce risk, but they do not offer absolute safety.

Building Regulations in England and the rest of the UK are currently at variance with many other jurisdictions around the world in allowing taller residential buildings to be constructed with a single means of escape. Last July's announcement that new residential buildings above 18m in height would need a 'second stair' left many questions open, such as whether this would be a requirement or just guidance in the Approved Document.

How might developers of residential buildings respond to the latest statement? It seems clear that the BSR will expect them to provide a second means of escape – but what will that look like? That depends on the fire-evacuation strategy, already required in the package submitted for approval of full plans known as Gateway 2, and signed off by developers at submission.

Two functional requirements of the Building Regulations consider escape and access: 'appropriate means of escape from the building to a place of safety outside the building, capable of being safely and effectively used at all material times' (B1) and reasonable provision for fire-fighting (B5). The developer needs to decide whether they are looking to reduce evacuation times by providing a basic second staircase. Or are they providing an alternative access route for firefighters? That requires both a second stair and firefighting lift. Each building needs a decision by the client and design team.

Gove's statement says that evacuation lifts 'will not be called for as a matter of course'. It could be taken to mean that, as a rule, they are to be expected, but a case may be made not to include one. It implies that it's up to the client to decide how to provide for those who cannot evacuate using the stairs, and for the BSR to accept that decision (or not?).

If the development contains social housing or student accommodation, there may be a public sector equality duty to consider in relation to the evacuation strategy. If it is entirely for sale or lease, how will that market react to the chosen strategy?

When complete, it will need a BSR building assessment certificate confirming it is safe to occupy, requiring a safety case specific to the building. With an ageing population, safe and equitable access and means of escape is also a demographic issue. Buildings will need to be adaptable.

It may be that the only feasible design with a realistic prospect of approval in many cases will incorporate two full cores offering genuine accessibility, resilience and redundancy in the event of a catastrophic incident.

This would align with the stance of the National Fire Chiefs Council². Rather than clarify the issue the Department has handed it back to the BSR and developers to resolve. And then to clarify through the first tranche of applications, appeals, determinations and maybe a judicial review?

REFERENCES:

¹ Written Ministerial Statement:

bit.ly/3PfvMsv

² NFCC Opinion paper bit.ly/49FmD43

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On 29th March the latest amendments to Approved Document B were published, setting out a new recommendation to provide more than one common stair in blocks of flats with a storey 18m or more in height, along with building design provisions to support the use of evacuation lifts in blocks of flats.

Full details to the summary of changes and to the amended AD are here: <https://www.gov.uk/government/publications/fire-safety-approved-document-b>

The final report into government funded research on means of escape in residential buildings was also published on 28th March, with findings on the potential role of evacuation lifts. Means of escape in residential buildings research - GOV.UK (www.gov.uk)

BIOGRAPHY

Dr Hywel Davies CChem CSci HonFCIBSE has recently retired as Chief Technical Officer from CIBSE after more than 25 years working for the Institution. He was CIBSE's technical director from 2007 until September 2023, after 10 years at the Building Research Establishment and 10 years as an independent consultant. He was awarded an Honorary Fellowship by CIBSE in 2023 – the first to be given to a serving member of staff. He led the government's expert group responsible for reviewing the use and structure of Approved Documents following the Grenfell Tower tragedy and led CIBSE's Covid-19 pandemic response. He has been an active author of and contributor to British, European and International Standards for over 30 years. He was the last chair of the Building Regulations Advisory Committee and is a member of the Building Safety Regulator's Building Advisory Committee, where he now serves in an independent capacity.





SECOND STAIRCASES AND EVACUATION LIFTS: AN INCLUSIVE DESIGN PERSPECTIVE

By Rachel Smalley,
Head of Inclusive Design at Jacobs



In October last year, the Secretary of State announced intended transitional arrangements to accompany new guidance relating to second staircases in new residential buildings in England above 18 metres³. The Secretary of State described these as 'the latest step in a continuing effort to ensure that new buildings are constructed, managed and maintained to the very highest standards', messaging which was reiterated in the Written Ministerial Statement (WMS) 'Long-term plan for housing update' issued on 19 February 2024.

The WMS committed the Building Safety Regulator to 'publish the new statutory guidance [in the form of a revised Approved Document B] on second staircases before the end of March, making clear the need for a second staircase in new multi-occupancy residential buildings that have a top occupied storey above 18 metres, and confirming that evacuation lifts will not be called for as a matter of course, providing housebuilders with the clarity they need to progress developments.'

The justification for these changes is that a 'second staircase will provide new buildings with additional resilience to support exit from the building and enhanced options for fire-fighting in the rare event of a catastrophic incident... and... will provide people with further confidence in the safety of new homes.'

SO, WHAT HAS THIS GOT TO DO WITH INCLUSIVE DESIGN?

To answer this question, we need to step back for a moment and understand what inclusive design is and who it considers.

An inclusive design approach takes into account any protected characteristic group (Equality Act 2010) for whom the design of the built environment could potentially impact both positively or negatively, including (but not limited to):

- **Age:** a range of age groups including older people, young people and children
- **Disability:** people with ambulant mobility impairments, wheelchair users, blind and partially sighted people, people with learning disabilities, people who are Deaf or have a hearing impairment, people with mental health conditions, some people with neurodiverse conditions and people with cognitive impairments

- People of all genders and gender identities
- People who are pregnant or have very young children
- People with a range of religious beliefs (or none)

Taking a range of end user group requirements into account helps to ensure that the resultant built environments work for a range of end users, and peoples' experiences are not less favourable due to their personal requirements, protected characteristics, or perceived 'differences'.

People who require level access/egress do not all come under one protected characteristic group, they could have protected characteristics relating to disability, age, pregnancy and maternity, or more than one of these at any given time. In addition people's requirements can change over time or with age, with different life events, or on a temporary basis.

Despite high-rise residential buildings in the UK increasing in prevalence since the 1950s, there has been very little change in means of escape provisions since the introduction of British Standard Code of Practice CP 3: Chapter IV 1962 Code Of Basic Data For The Design Of Buildings Chapter IV Precautions Against Fire Part 1. Fire Precautions in Flats and Maisonettes over 80ft in Height.

This is despite the changing demographics of the UK. For example, just in terms of the protected characteristic of age, in the last UK Census in 2021 over 11 million people – 18.6% of the total population – were aged 65 years or older, compared with 16.4% at the time of the previous census in 2011.

Without careful consideration of factors such as changing demographics, the design of the built environment can unintentionally work to treat some people less favourably than others due

to their protected characteristics or personal requirements.

Level egress from buildings in an emergency is a requirement for a range of people, but why has it been linked to the subject of second staircases in this Written Ministerial Statement (WMS) by the Secretary of State? On the surface second staircases and level egress are two distinct subjects, which should be addressed separately.

The link between the two lines within the WMS stated benefit of 'supporting exit from the building' and the Equality Act definition of discrimination. This benefit will only be experienced by people who can use the stairs and who do not require level egress. If it is intended that people will use the second staircase to exit from a new-build residential building in an emergency, then people who require level egress will have fewer options to exit the building, compared with people who can use stairs.

The extent to which people who require level access are treated less favourably is likely to increase with these changes. This is because the new requirements are very likely to result in a greater difference in options and experience for people who require level egress, when compared with options which will be available to people who do not. The difference between the two groups' experience is likely to increase, be exacerbated and 'worsened', creating greater disparity and differential treatment of certain people due to their protected characteristic requirements.

Some people may read the WMS and assume that evacuation lifts are already included in statutory guidance and will simply not be included in the guidance for the second staircase. However Approved Document B does not currently contain any guidance on the installation of fire evacuation lifts.

People who can use stairs currently have at least one option for independent egress, and will soon, in many new build residential buildings, have a second. But what independent egress options exist for people for whom stairs are not suitable? The answer in most cases is none.

The proposed amendment to the statutory guidance to incorporate guidance on a second staircase represented an opportunity to rectify this situation and many expected that this would happen. The caveat 'as a matter of course' still maintains some possibility that acknowledgement of the diversity of end user requirements may be considered by developers.

This is more likely in London due to London Plan policy D5 Inclusive Design. However, more generally and outside of London the WMS does not give much hope that a much-needed change from historic guidance and a traditional approach which does not consider all resident requirements is coming.

It will also be interesting to see how the Secretary of State shows how Section 149 of the Equality Act (2010) has been responded to in terms of the decision-making process which informed the WMS. Section 149 requires public authorities to, in the exercise of its functions, have due regard to the need to advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it, ...in particular, to the need to -

- remove or minimise disadvantages suffered by persons who share a relevant protected characteristic that are connected to that characteristic
- take steps to meet the needs of persons who share a relevant protected characteristic that are different from the needs of persons who do not share it

The forthcoming amendments to the statutory guidance (Approved Document B) represented an opportunity to deliver meaningful change to people who will be living in new build residential buildings in England above 18 meters, to futureproof dwellings and ensure they are suitable for as many people as possible in terms of egress. However, based on the WMS, it would appear this will not be achieved.

REFERENCES:

Written Ministerial Statement:
bit.ly/3PfvMsv

NFCC Opinion paper bit.ly/49FmD43

House of Commons, Building Safety Update, Statement made on 24 October 2023 Statement UIN HCWS1090)

February 2024 statement: Written statements – Written questions, answers and statements – UK Parliament

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AN UPDATE FROM NICK MELLOR, PRESIDENT, LEIA

The articles by Hywel Davies and Rachel Smalley articulate the situation arising from the written ministerial statement of 19 February from Michael Gove, Secretary of State at the DLUHC on "Long term plan for housing update". A revision of Approved Document B (the statutory guidance for fire safety) is expected by the end of March (after this piece was written). Michael Gove's statement made clear that this new guidance will not include a requirement for evacuation lifts for new higher risk buildings even though second staircases will be introduced for new higher-risk buildings. Under the new Building Safety regime, a higher-risk building is one that has at least 7 storeys or is at least 18 metres in height and either is a hospital or care home or has at least 2 residential units.

Uncertainty in the guidance over second staircases and evacuation lifts has impacted on the numbers of new high-rise residential buildings being started. But does Michael Gove's statement provide the needed clarity?

The statement made clear that owners and those carrying out building works, including developers, need to demonstrate (to the Building Safety Regulator) that the functional requirements of the

building regulations have been met – in this case B.1 means of escape.

How might owners and developers proceed if they are intending to include evacuation lifts to provide a means of escape for those who cannot readily use stairs? It is hoped that the revision of Approved Document B would include guidance on how evacuation lifts should be included.

Currently BS 9999:2017, Annex G is the only specification for an evacuation lift in British Standards. This is based on an assistant or driver to take control of the evacuation lift car. Work is in the final stages of preparing a new standard for evacuation lifts; a final draft FprEN 81-76 is expected in the next months and hopefully a published BS EN 81-76 late in the year. A new BS EN 81-76 would, once published, include an option for driver assisted evacuation operation and also an option for an automatic evacuation operation. This has attracted interest since, in many buildings such as residential buildings, having a team to take control of the evacuation lift might not be practicable.

Having evacuation lifts with an automatic evacuation operation would provide for those requiring level access and would be a step forward in providing equitability for evacuation for all building users.

In the meantime, a revised BS 9991; Fire safety in the design, management and use of residential buildings – Code of practice is expected to be published and, since the draft for public consultation included recommendations for evacuation lifts, something on evacuation lifts is expected.



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NHS England Guidance
(HTM 08-02)



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ENHANCING INCLUSIVITY IN LIFT DESIGN

At the Lift & Escalator Symposium last year it was both interesting and challenging to hear Rachel Smalley, Head of Inclusive Design at Jacobs, talking about the Principles of Inclusive Design.

In an interview with Rachel on the Jacobs website she says:

The term 'inclusive design' is commonly used, but it's heavily misrepresented and misinterpreted. Many discuss it in the context of Equality, Diversity and Inclusion (EDI) and industry representation — which is a crucial area of focus — but it's not inclusive design. People also often use the term inclusive design when referring only to access for disabled people, and it goes way beyond that.

<https://bit.ly/3UKSeqj>

Designing lifts for inclusivity involves considering the needs of a diverse range of users, including those with disabilities, sensory sensitivities, and varying mobility levels.

The CIBSE Lifts Group have put together some key principles to enhance inclusivity in lift design.

Training and Awareness:

Train building staff to be aware of the diverse needs of lift users and how to assist individuals with disabilities.

Universal Design Principles:

Apply universal design principles to ensure that the lift is user-friendly for everyone, regardless of age, size, or ability.

User-Friendly Interfaces:

Design intuitive user interfaces that are easy to understand and operate, benefiting all users, including those with cognitive or developmental disabilities.

Auditory and Visual Information:

Include both visual and auditory signals to convey lift status and floor information. This is essential for users with visual or hearing impairments. Use clear, high-contrast visual displays with large, easy-to-read fonts.

Automatic Doors:

Train building staff to be aware of the diverse needs of lift users and how to assist individuals with disabilities.

Handrails:

Provide handrails in lift cars to provide support during entry and exit while ensuring stability during elevator movements.

Accessibility

Standards Compliance:

Ensure compliance with local and international accessibility standards, such as the Americans with Disabilities Act (ADA) in the United States or the EN 81-70 standard in Europe.

Accessible Controls:

Place controls at various heights to accommodate individuals of different heights and mobility levels. Implement tactile and Braille markings for buttons to assist those with visual impairments.

Emergency Communication:

Install emergency communication systems with clear instructions and options suitable for a variety of users, including those with speech or hearing impairments.

Voice Announcements:

Provide audible announcements for floor numbers and other relevant information. This benefits individuals with visual impairments.

Spacious Design:

Provide ample space inside the lift to accommodate wheelchairs, mobility aids, and service animals. Ensure that there's enough turning space for wheelchairs to easily manoeuvre.

Adjustable Lighting:

Ensure that the lighting inside the lift is adjustable to accommodate users with light sensitivities or visual impairments.

Regular Maintenance:

Ensure lifts are regularly maintained to minimise breakdowns and malfunctions that could disproportionately affect individuals with disabilities.

Non-Slip Flooring:

Choose flooring materials that provide good traction to prevent slips and falls, catering to individuals with mobility challenges.



SAFETY FIRST



Dave Cooper, our expert adviser looks at

ESCALATOR COMB PLATES

For the lifties and non technical readers out there who don't work on escalators the comb plates are found at the ends of the escalator where the steps disappear under the fixed landings at either end.



They play a very important safety role as their purpose is to protect passengers from an open gap that would otherwise exist under the landing plate and present a risk of entrapment by items such as shoes, fingers, foreign objects etc. The absence of comb plates could have seen the whole shoe in the photograph below being drawn into the machine.

In the days prior to what we now know as the common escalator some designs had shunt landings where you had to step to the side to step off rather than the conventional straight on and off designs we are familiar with today. In those days no comb plates existed and entrapments were common.



Maintenance of comb plates is very important and in particular areas of concern are:

- that the teeth are in good condition.
- the ingress of the comb plate teeth into the step tread cleats is set correctly.
- the comb plate switch(es) that detect an entrapment are functioning.
- the treads of the step band are also to good condition.
- that the steps go through the combs correctly.

It is vital that comb plates are maintained in a good condition as a failure to do so could present not only a risk of entrapment but also a risk of not stopping the escalator when an obstruction is encountered.

When an escalator is required to stop there is a correlation between the distance and time it takes to stop the step band from rotating and the forces imposed upon passengers. Stopping the escalator too quickly could cause passengers to fall down the escalator whereas taking too long to stop the step band could result in serious injury to a trapped person.

When a comb plate detects an obstruction, it should stop the escalator and it is therefore important to ensure that this function is operating correctly.

Missing comb plate teeth should be noted by persons undertaking routine start up of an escalator remembering that a higher risk exists at the exit end compared to the entry end but nevertheless most escalators are reversible and therefore both ends should be properly maintained. An example of poorly maintained comb plates on an escalator can be seen below.



I have to say this is probably the worst example of comb plate maintenance I have ever seen and you won't be surprised to hear that a passenger was injured as a result of falling over at the wrong time and their fingers disappeared into the gap.

Trapping at the comb plates is listed as a significant hazard in the EN115 standard.

Table 1 — List of significant hazards

Nr.	Hazard/hazardous situation	Priority level	Relevant clause of EN 115-2
1	Affect of harmful materials (e.g. asbestos)	H	5.1
2	Contact with moving machinery parts (e.g. driving unit, handrail drive, step or pallet) normally not accessible to the public	M	5.2.1, 5.4.1, 5.12.2, 5.13.2.1
3	Fire inside the supporting structure and machinery spaces	M	5.2.2, 5.9
4	Slipping on steps/pallets/belt and landing areas	H	5.3.1, 5.7.1
5	Falling due to insufficient step demarcation	M	5.3.2
6	Trapping between skirting and steps	H	5.3.3, 5.5.3
7	Trapping between step and step or pallet and pallet	H	5.3.4
8	Missing steps or pallets	H	5.3.5
9	Collision between fixed and moving parts of the step/pallet/belt system	M	5.3.6
10	Uncontrolled movement or a failure to stop of the machine resulting from missing second independent main contactor	H	5.4.1, 5.4.2.3
11	Excessive speed and unintended reversal of direction	M	5.4.2.1, 5.4.2.2, 5.4.2.5
12	Effect of excessive stopping distance	L	5.4.2.4
13	Falling due to reduced stopping distance	H	5.4.2.6
14	Falling over the balustrade	M	5.5.2.1, 5.5.2.2
15	Falling resulting from sliding on the outside of the balustrade	L	5.5.2.3
16	Climbing on the outside of the balustrade or falling from the landing	H	5.5.2.3, 5.13.1.6
17	Falling due to handrail speed deviation	M	5.6.1
18	Crushing of fingers between handrail and balustrade	H	5.6.2
19	Drawing-in at handrail entry into the balustrade	HM	5.6.3.1
20	Trapping at handrail entry (between handrail and floor)	M	5.6.3.2
21	Trapping between comb and step/pallet	H	5.7.2, 5.7.3
22	Trapping of users resulting from sagging of the step/pallet	H	5.7.4
23	Miscellaneous equipment in workers' area not related to the installation	M	5.8.1

SAFed guidance (EMW) sets out the recommended discard criteria for escalator comb plates with missing and/or damaged teeth and requires that when two adjacent teeth are missing the comb plate should be replaced.

The condition of the comb plate teeth will also give an indication of possible other problems with an escalator such as crabbed steps or terminal guide wear.

It is important that owners understand that comb plates are consumables. They will get damaged during routine use of the escalator and will need to be replaced every now and then.

BIOGRAPHY

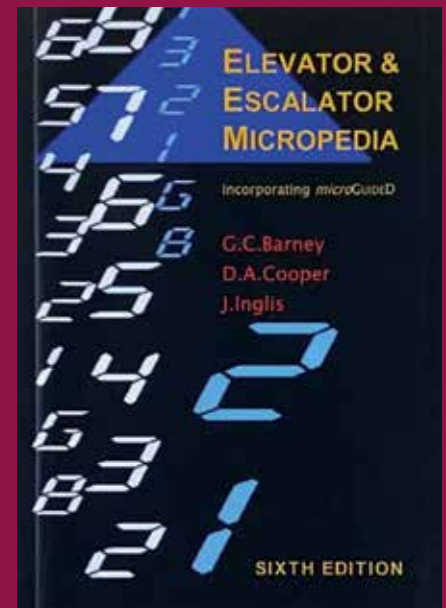
Eurling Prof. David Cooper MBE, BSc (Hons), MSc, MPhil, CEng, FIET, FCIBSE, FIMechE, FSOE, FCGI, is the CEO of consultants LECS (UK) Ltd. With 44 years' experience he is a well-known author and speaker, an Honorary Visiting Professor at The University of Northampton and is Vice President of CIBSE. He chairs both the UK's Lift Industry Charity and the Charity that runs the Lift Symposium. In 2021 he received the Sir Moir Lockhead Award for 30 years dedication to safety in the industry and in 2023 received an MBE in the Kings Birthday Honours list for services to lift & escalator engineering.

ELEVATOR & ESCALATOR MICROPEDIA

The Elevator & Escalator Micropedia is a compendium of useful data providing a handy first "port of call" for information. It comprises: a glossary of over 2150 terms; drawings of lift components; tables & formulae and a "microGuideD" referencing CIBSE Guide D 'Transportation systems in buildings'.

The book has been compiled by industry experts from authoritative sources across the world. It will be of practical use to designers, field service personnel, installers and engineer surveyors.

Also, building owners, facilities managers, lift operators, teachers, researchers, students, etc. will find it a helpful reference book.



This edition has been extensively revised to cover the advent of EN 81- 20 / 50 and the emergence of the ISO 8100 family of standards.

Copies of the Elevator & Escalator Micropedia can be obtained from

<https://www.cibse.org/knowledge-research/knowledge-portal/geem-elevator-escalator-micropedia-6th-edition-soft-cover>

Price £12.50, {£11.00 CIBSE Members} (no VAT)



Founded in 2006, with a team of four, VerticA Consulting's 18 year history has seen a steady, successful growth. Priding themselves on bespoke solutions and expert advice, VerticA works worldwide from their Northamptonshire office, now with a team of 12. We caught up with Director Ralph Smith to find out more about VerticA's vision and secret to success.

THE INTERVIEW

What was the catalyst for creating VerticA?

Myself and David Thompson, VerticA's other Director at the time, had worked together on a number of occasions, and came together again in 2005 with two others as a core team of four. We formed VerticA in 2006, creating a brand that really showcases what we do as a vertical transportation consultancy, providing bespoke solutions to our customers.

Can you give us an overview of what VerticA does?

We're based in Northamptonshire, although we undertake projects all over the UK and Ireland as well as Europe. We actually have current and prospective projects around the world, although typically we don't visit these in person.

We offer lift and escalator consultancy for new construction and existing buildings; from new design through upgrading or replacement to the support of in-service equipment. We provide performance assessment, vertical transportation strategies, simulation, and calculation as well as inspection, condition, reliability, and technical support, amongst other essential vertical transportation consultancy services.

What's your company vision?

We are focused on providing an excellent bespoke service so that our customers can succeed in their business. Our mission statement is "Our business will thrive by offering a service tailored to suit the needs of each customer and by ensuring excellent customer satisfaction. In this way we contribute to the success of our customers and their businesses also." This has stood the test of time. We're focused on excellence and committed to working hard to see our customers thrive – that's what motivates us.

What sets you apart and makes VerticA unique?

Our team has a unique breadth of skills that enables us to tackle all projects with experience, knowledge and skill. We work from a core office, allowing us to easily collaborate and quickly identify the right mix of skills for each project, regardless of where it is located, rather than just sending whoever is closest!



We create a bespoke offering for each customer, with a service tailored to their requirements. Modern building design is changing; we're seeing more multi-use buildings with elements such as communal floors in different locations over the height of a building. In these cases, there's a risk that best practice lags behind what is being designed and built. We have the skills to build a model that is unique for any such building that reflects its likely use, rather than being reliant on standard templates.

How do you inspire and motivate your team?

I can't expect my team to work hard if I don't, so I lead by example! We've got a great team, our people are what makes the business. It can be demanding and stressful, but we bounce off each other and there's a mutual support - that's what gets us through the challenges we face. The benefit of having a close team is that we all know each other, and friendships have grown out of working together. You'll often find us socialising outside of work, which makes us closer as a team.

Can you tell us about a recent successful project?

We've recently completed the design of a substantial consultancy project for a public venue in the Middle East, which I'm really proud of. NDAs prohibit me from going into detail, but since completion, we've secured four additional similar projects in the same region, with more in the pipeline. This is such good news for our team and underlines the hard work that goes into every project.

With the theme for this issue centred on building regulations, how have these new regulations impacted the way you work?

More than how we work, it'll change how we specify things, as there's a greater focus on fire-fighters' and evacuation lifts than we've ever seen before. Additionally, we're looking at futureproofing buildings for this, in some instances working with forward thinking clients and putting in second fire-fighters' lifts for resilience and helping to maintain revenue streams for the client. To ensure our team are fully informed, we've undertaken additional training to make people aware of the new regulations, and we've seen some team members join the Association of Project Safety, to keep abreast of the changes, now and into the future.

Where would you like to see the company in five years' time?

It would be easy for me to throw out an aspiration to be three times the size we are now, but for us it's about being mindful about recruiting the right people at the right time. The important thing for Vertica is careful and steady growth, identifying opportunities to grow and maintaining our identity of

striving for excellence. Recruiting people with the right skills and outlook, particularly engineers, can be a challenge, and we're determined to get it right and grow organically, as we find the right people to join our team.

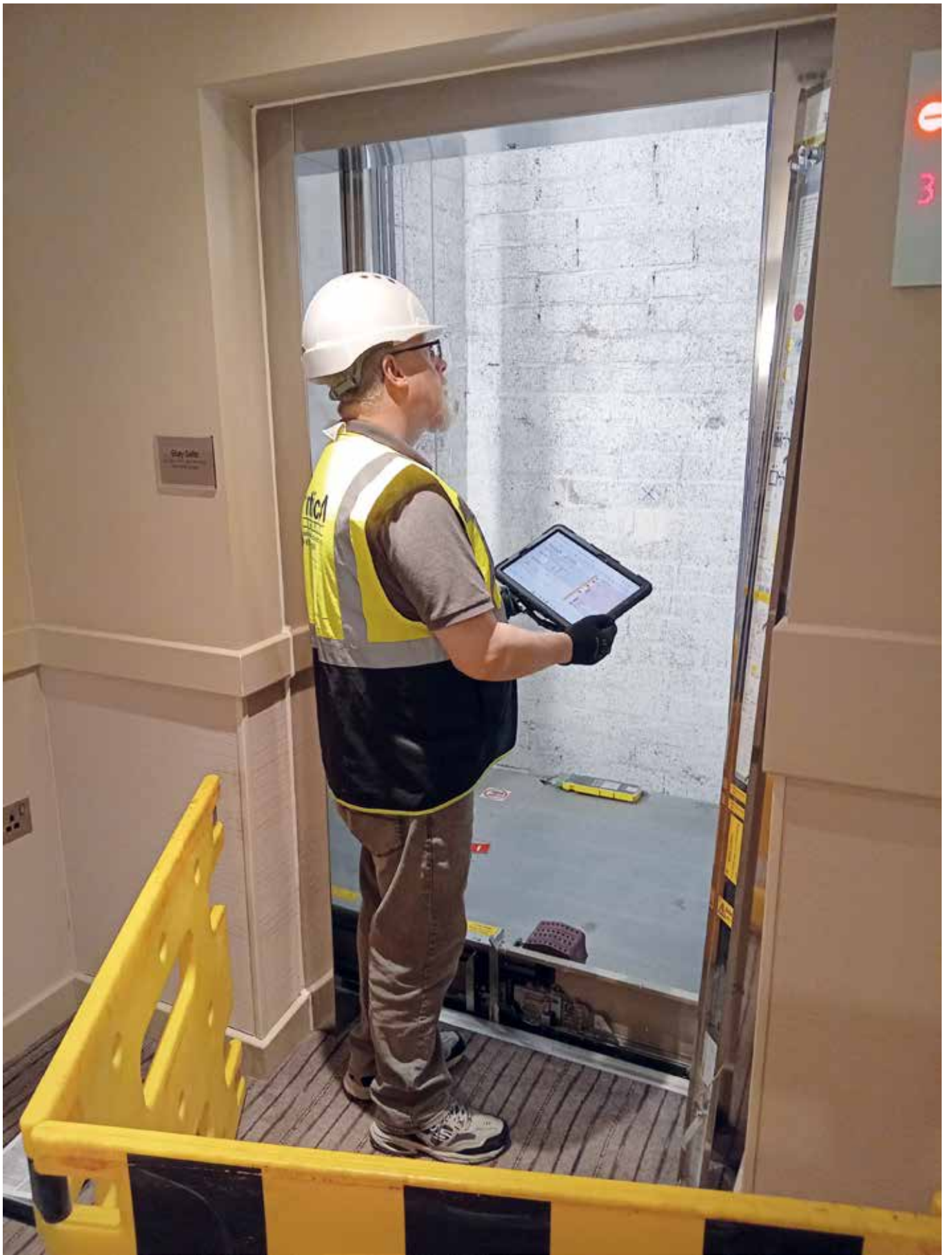
What are your priorities for 2024?

Our team has grown by two people, with one more joining soon. That will take our team to 13 people. Our priorities for 2024 are to support those people in developing into their roles, which will enable other team members to evolve and grow and develop into new roles themselves. This ultimately benefits our customers, with a new wave of ideas and strengths. It has to remain fluid as we react to our clients' requirements, and as we don't have a standard product, every project is unique and investing in our team will allow us to continue to deliver excellence.

Many aspects of Vertica are growing, but public venues, such as stadiums and arenas, is an area we'd like to continue to grow into. The skills required for this type of work are unique and we're well equipped and experienced to undertake these types of projects.

Our business thrives through recommendation and word-of-mouth, so we pride ourselves on delivering a high class service that brings repeat customers and initiates positive conversations within the lift industry.

To find out more about the company, visit their website - <https://www.vertica-consulting.co.uk/>





LIFT & ESCALATOR SYMPOSIUM

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TECHNOLOGIES

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Keywords: Modernization, post-pandemic workplace, societal changes, innovation.

Abstract: Modernization has been a part of the lift industry for a very long time. There are buildings that are over 100 years old that have been modernized multiple times but continue to use the original direct current machine. Both societal changes and technical innovations will make the modernizations of the very near future different from the modernizations of the present. The motivations for modernization, the societal changes, and the technical innovations

FUTURE MODERNIZATIONS

1. INTRODUCTION

Buildings, like most other products, compete with other buildings for customers. In the case of buildings, the customers are the entities who lease or buy the space in the building. While there are many factors that affect the customer's decision, some of the most important factors are location, price, and building features.

New buildings have all the latest features. Existing buildings must upgrade their systems or accept lower rents. It is for this reason that buildings have modernized their lifts in the past. However, that was before COVID-19.

The post-pandemic commercial real estate market will also see changes in building use and building specifications. These changes will affect lift requirements and create new lift modernization opportunities, even for relatively new buildings that were completed before and during the pandemic.

Future modernizations will need to address the following two requirements,

1. Post-pandemic workplace requirements.
2. New technologies.

The pool of existing buildings that must modernize to compete with new buildings is large. The following are three examples:

1. At the end of 2020, the average commercial building in the USA was 52.67 years old [1].
2. In Europe, 80% of existing commercial buildings were built before 1990 [2].
3. China's period of reform and reopening began in 1978. Many of the of buildings built in the first 20 years of this period will need to be modernized [3].

2. THE POST-PANDEMIC WORKPLACE

2.1. SOCIETAL CHANGE, WORKING REMOTELY

Businesses have learned that people can work productively from remote locations such as home offices. However, teamwork, collaborative efforts, mentoring, and the development and maintenance of corporate culture requires people to work together in the same location.

The question that the real estate industry is trying to answer is, "How many people will ultimately continue to work remotely and how many

people will return to the office?” Industry leaders are forecasting that between 60% to 80% of the work force will return to the office [4] [5]. However, many people will utilize a hybrid solution of working some days of the week in the office and some days of the week from a remote location.

If 80% of the workforce returns to the office, it would appear there will be a very large surplus of office space and, consequently, vacancy rates will increase. However, it also appears that the workforce wants to continue to exercise social distancing. Additionally, workers have found open office spaces are less productive because it is difficult to concentrate in such an environment.

Because working remotely will create some level of surplus office space. It is possible that some office buildings will be converted to residential buildings. In fact, the author has been informed by a lift consultant that his firm is working on two projects where an office building is being converted to a mixed-use building that includes both office space and residential units.

2.2. TOUCHLESS

Contacting a contaminated surface is one way that COVID-19 and many other bacterial and viral diseases can be transmitted. Touching a lift push button or grabbing an escalator handrail are correctly perceived to be good ways to spread disease. As a result, many lift companies are offering touchless solutions for lifts and handrail sanitizing devices for escalators [6].

Destination Dispatch systems inherently are more “touchless” than conventional control systems with up and down buttons because one must only enter their destination. Using smart devices such as mobile phones, ID badges and facial recognition systems make it possible to have a completely touchless lift.

It is often not necessary to replace a control system to upgrade to a touchless Destination Dispatch system. Many companies are offering Destination Dispatch overlay systems [7].

One can therefore expect there will be an increase in control system modernizations or upgrades to touchless Destination Dispatch systems.

For safety, escalator users are encouraged to hold the handrail. Since a touchless handrail is not possible, two solutions are currently being offered: Ultra-violet C sanitizers and handrails with anti- microbial coatings [8]. It is logical to expect that many escalators will be upgraded by installing these devices.

2.3. CABIN SPACE

Personal space has always defined the number of passengers that a lift car could transport. A value of 0.21m² per person is commonly used. However, in the post-COVID-19 world, it is anticipated that this value will increase.

The combination of reduced passengers per floor, increased personal space in cabins, and the use of contactless destination dispatch controls will have an impact on the traffic handling capacity of a lift system.

The overall impact of these factors can be evaluated using simulation. The following examples compare the traffic handling performance of a hypothetical building designed before COVID-19 and the same building with features designed post-COVID-19.

The two systems were evaluated using ELEVATE® simulation software.

2.3.1. EXAMPLE 1, BEFORE COVID-19

The building has 18 stops, 58 people per floor, 6 lifts with a capacity of 1350 kg, and a speed of 3 m/s. The control system is Group Collective.

Using the Enhanced UP Peak calculation, the system had a 31.4 second interval at an arrival rate of 12%.

Simulations using the Peters Research Modern Office Lunch Peak 2015 template and the Peters Research Modern Office Up Peak template with a Passenger Area of 0.21 m² per person. Table 1 summarizes the results:

Table 1 Simulation results, Passenger Area: 0.21 m² & 100% occupancy

	Waiting Time	Transit Time	Time to Destination
Lunch	24.3	64.4	89.7
Up Peak	9.3	70.0	79.4

It should be noted that with a passenger area of 0.21m², the maximum number of passengers transported per trip is 14.

2.3.2. EXAMPLE 2, POST-COVID-19 TRAFFIC

A second set of simulations was run using post-Covid parameters. The number of persons per floor was reduced to 43, which represents 80% of the 58 persons pre-COVID-19. Personal space was increased to 0.5 m² per person. This limits the maximum passengers per trip to 6. Additionally, touchless Destination Dispatch system (ACA) control system was used. Table 2, summarizes the results:

Table 2 Simulation results, Passenger area: 0.5 m² & 80% occupancy

	Waiting Time	Transit Time	Time to Destination
Lunch	26.8	35.4	62.2
Up Peak	19.0	36.0	55.0

One can see that the existing lifts with new controls, when applied with post-COVID-19 conditions, had improved traffic handling performance.

2.4. VENTILATION

Traditionally, there have been two approaches to forced cabin ventilation:

1. Extraction. Ceiling fans extract air from inside the cabin and vent it into the hoistway.
2. Supply. Ceiling fans force air from the hoistway into the cabin.

In response to COVID-19, lift companies are offering supply type ventilation systems that pass the air either through an ionization chamber or an ionization chamber combined with a filter [8], [9]. Passengers can still spread disease by sneezing or talking, but these systems ensure that the air entering the cabin is sanitary and the air flow will prevent contaminants from lingering in the cab.

Another method of sanitizing Supply type ventilation systems is the use of UV-C lamps near the supply intake [10]. This approach works in the same manner as the UV-C systems used for escalator handrails.

3. NEW TECHNOLOGIES

There are two technologies that will create a demand for future modernizations or system enhancements. These technologies are Connectivity and Machine Learning.

3.1. CONNECTIVITY

Connectivity, as it relates to Information Technologies, is defined as “*the ability to connect to or communicate with another computer or computer system*” [11].

For the lift industry it typically signifies that the lift control system is connected to a remote computer using cloud technologies. The information sent from the controller can be used for many things including Machine Learning, interfaces to other building systems, applications (Apps) used by building managers and, and Apps used by lift passengers.

Connectivity systems that connect directly to the control system are available for most new or recently installed lifts.

Existing lifts can be connected using sensor packages with which have little or no connection to the control system. Using one of the many commercially available connectivity systems, virtually any lift can have some level of connectivity [12].

The data from the connectivity system can be processed and made available to other computer programs by way of an API.

An API is an Application Programming Interface [13]. A User Interface (UI) allows a person to communicate with a computer. An API lets a computer communicate with another computer.

The following are some examples of computer systems that may want to access a lift system’s API:

1. A Building Management System (BMS) computer.
2. A security system computer.
3. A Facilities Management Company’s computer.
4. A service robot that wants to use the lift.
5. A Government agency computer.

Apps are Applications that can be downloaded onto a mobile device such as a smartphone or a tablet [14]. Apps for lifts are used interfaces to permit service personnel, passengers, and building managers to access data about or communicate with lifts and escalators. The following are some examples of lift apps:

1. App to place calls in a destination dispatch system.
2. App to help service personnel diagnose lift problems.
3. App for facility managers and building engineers to receive performance data and alarms about their lifts and escalators.

Connectivity will only be possible if lifts and escalators are upgraded or modernized.

3.2. MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

The goal of Artificial Intelligence (AI) is to develop computers and software that mimic human intelligence. Machine Learning (ML) is one form of Artificial Intelligence (AI). Machine Learning involves making predictions based on properties learned from data [15].

There are many forms of ML. The following are two forms that can be used for lifts:

1. Classification and Regression Trees (CART).
 - a. Description: These trees are decision trees that learn from what has occurred in the past and use that knowledge to make predictions about future outcomes [16].
 - b. Example: The output of a lift remote monitoring system records what has happened in the past. Analyzing this data using CART might reveal a sequence of events and or error codes that almost always leads to a shutdown within two weeks.
2. Artificial Neural Networks (ANN)
 - a. Description: ANN's are computing systems inspired by the biological neural such as human and animal brains [17]. These networks have the ability to learn.
 - b. Example: An ANN is shown the vibration signature of a properly functioning lift component and told it is the signature of an undamaged component. It is also shown the vibration signature of a damaged component and told it is the signature of a damaged component. Many vibration signatures are shown to the ANN and in time the ANN learns to identify damaged components by their signature.

Because of its ability to learn and predict, Machine Learning will make possible tremendous improvements in reliability and maintenance efficiency [18]. Soon it will be possible to almost completely eliminate lift breakdowns except those caused by external factors such as misuse, abuse, vandalism or acts of God.

Building owners and managers want the improvement in up time that is made possible by Machine learning.

Machine learning generally requires connected lifts and escalators.

4. CONCLUSIONS

The modernizations of the future will be driven by societal changes and innovation.

The societal changes are the result of our experience with the COVID-19 pandemic. Society knows how to work remotely at least a portion of the time and that we are more comfortable with greater personal space and less contact with potentially contaminated surfaces.

Building owners, building managers, and building occupants want the benefits made possible by connectivity.

Even recently completed or modernized lifts are candidates for additional upgrades to deal with the changing workplace. The market for lift modernizations and upgrades has never been better.

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BIOGRAPHICAL DETAILS

Dr Rory Smith is Visiting Professor in Lift Technology at the University of Northampton and a Consultant at Peters Research Ltd. He has over 52 years of lift industry experience during which he held positions in research and development, manufacturing, installation, service, modernization, and sales. His areas of special interest are Robotics, Machine Learning, Traffic Analysis, dispatching algorithms, and ride quality. Numerous patents have been awarded for his work.



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1927 - THE YEAR THAT SET THE DIRECTION OF TRACTION LIFT ENGINEERING FOR A CENTURY

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Keywords: Lift, history, traction, lift engineering

Abstract: Nearly a century ago in 1927, F. Hymans and A. H. Hellborn published their famous book "Der neuzeitliche Aufzug mit Treibscheibenantrieb" (Modern elevator with traction sheave drive), which had a major impact in the introduction of traction sheave lifts to the European Market and laid the groundwork of modern lift engineering. The book explains the function of traction sheave lifts, the theory of traction calculation and several other key principles of lift engineering.

A less known, but likewise important book, was published on the same year by H. Donandt. His dissertation "Über die Berechnung von Treibscheiben im Aufzugbau" (On the calculation of traction sheaves in elevator construction) touched some of the same topics as Hymans' and Hellborn's book, but merits independent recognition.

A major handicap in understanding the background of modern lift engineering is that to this day neither of the books have been translated into English for the wider lift engineering audience.

This article gives an overview on the content of these books and explains how these two books differ in their approach. The article also briefly introduces the authors and the historical framework behind these books. Sections of these books that have had larger significance to this day are given specific attention.

This paper addresses the generation of dynamic lift kinematics to meet these requirements and discusses their application.

1. LIST OF SYMBOLS

- α Undercut angle
- γ Angle of submersion of rope in the groove (Also wedge angle for wedge shape groove)
- φ 1-sided contact angle between the rope and the groove
- μ Apparent friction coefficient (friction factor)
- μ_0 (Actual) Friction coefficient
- b Acceleration/
Deceleration of the lift
- d Rope diameter
- D Traction sheave diameter
- N Normal force
- g Gravity acceleration
- S Rope tension
- W Friction force

NOTE! There is some inconsistency in the symbols in figures due to original source images.

2. INTRODUCTION

The later part of 19th century and the beginning of 20th century was a period of fast development in the building and industrial sectors. As construction techniques improved and buildings got taller, so did the demand for higher lift travels. The USA had assumed a leading position in the construction of tall buildings, and it was only logical that the Americans were also in the forefront of lift engineering. A key paradigm shift was the transition from drum lifts to traction lifts, which changed the lift industry as profoundly as the invention of the safety gear a half-century earlier.

The transition to traction lifts had an impact on the way lifts were engineered and there was a need to raise awareness of these new engineering principles. A book by F. Hymans and A. H. Hellborn "Der neuzeitliche Aufzug mit Treibscheibenantrieb" (The modern elevator with traction sheave drive) rose to the occasion and became a cornerstone for lift engineering for decades. The book is not without shortcomings though. As the writers were working for Otis, revealing the full extent of their knowledge was not necessarily within their interest. One can speculate that the motivations of two Otis employees to write a book in German was not just raise the general level of knowledge, but

also to advertise the state of American engineering and to gain wider acceptance to their engineering principles to help the sales of Otis products overseas.

Already prior to the publication of *Der neuzeitliche Aufzug*, the benefits of traction lifts had been seen in Germany. To study some of the key engineering problems, a doctoral dissertation was launched in the Technical University of Karlsruhe. One of the supervisors was Dr. G. Benoit, who was an influential figure in the German lift association at the time. This dissertation by H. Donandt was published at the same time as *Der neuzeitliche Aufzug* and addressed some of the same topics as Hellborn and Hymans, but without the ulterior motives of a commercial nature. Donandt's publication has had much less recognition than his American counterpart but some of his conclusions have had long lasting implications.

3. HISTORICAL CONTEXT

In the introduction of *Der neuzeitliche Aufzug* it is mentioned that traction sheave lifts were first introduced in the American market circa 1890, but at that time they could not compete with drum type lifts due to the double wrap construction and lower market needs [1]. In an earlier article by Hellborn it is mentioned that "full-wrap traction" (double wrap) (Fig. 1a) had been used in New York skyscrapers for years and that "half-wrap traction" (single wrap) (Fig. 1b) had been found in England for a long time [2]. The year 1919 is also referenced as a turning point from drum type to traction type lifts.

In his dissertation Donandt is making references to earlier publications concerning Koepe hoist [3]. The Koepe hoists are used in the mining industry and are also based on the traction sheave principle. The Koepe hoist had been patented in many European countries in 1887 [4], however, the traction sheaves with wood and leather inserts used in Koepe hoists made the design unfeasible for lift applications.

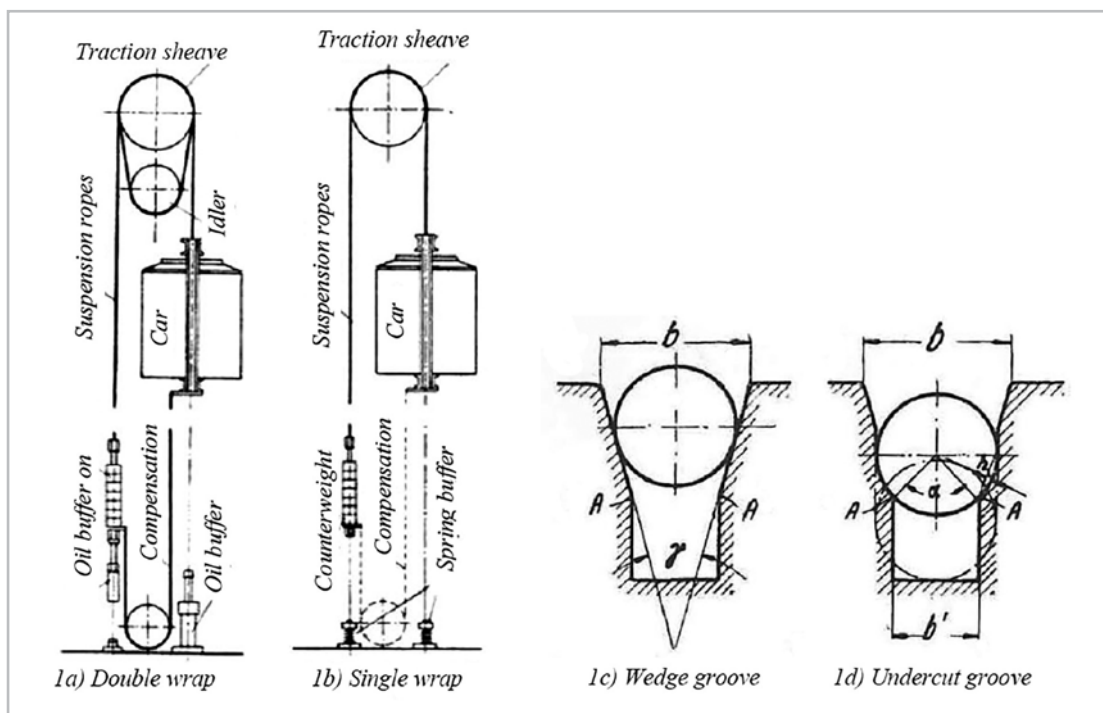


Figure 1 Illustration of double and single wrap lifts [1] and wedge and undercut rope grooves [3].

Although a lot of proprietary experimental data must have been available in 1927, a theoretical basis was needed to quantify the traction capacity. This was the problem that Hymans, Hellborn and Donandt set out to resolve¹. Attention was especially paid to the single wrap configuration where traction is not so abundantly available, and to the relatively novel undercut rope groove design (Fig. 1d).

The most well-known of the three authors is undoubtedly Frederick (Fred) Hymans and his biography is well covered in two articles by Gibson [5] [6]. Here it suffices to say that Hymans made an extensive career in OTIS and American Society of Mechanical Engineers (ASME), published two books in addition to the *Der neuzeitliche Aufzug*, wrote several articles published in ASME Transactions and within OTIS internally and participated actively in overall technical discourse during the first part of 20th century.

Less is known about Hymans' co-writer Axel Hellborn. Based on Gray [7] he appears to have only made a short career in OTIS, but it is worthwhile to notice that the article that predates *Der neuzeitliche Aufzug* was written solely by Hellborn, albeit he gives credit to Hymans in one footnote. Later – after the Second World War - Hellborn was contracted by the Finland Industry Delegation War Compensation (Soteva) to rationalize industrial production across multiple companies (incl. KONE), to improve Finland's ability to meet its obligations to the Soviet Union [8], but there are no records of his involvement in lift engineering since *Der neuzeitliche Aufzug*.

Prior to his dissertation Hermann Donandt worked for R. Stahl A.G. in Stuttgart where he had his introduction to the lift industry [3]. Later he made a career in the Karlsruhe Institute of Technology (KIT), where his supervisor Georg Benoit had founded a chair for lift and transport machines. Donandt is credited in particular for rebuilding the department after the Second World War. He was the director of Institute for Material Handling and Logistics in KIT during 1947 – 1966. Industry legend Klaus Feyrer, for instance, studied there during his leadership period. He was also influential in the development of the lifts to the Moscow TV-tower, which were a substantial engineering achievement at the time [9]. In addition, he acted as director of the testing centre of the German lift committee, was involved in the development of safety gears and carried out studies into stresses in wire ropes [10].

4. THE MOST RELEVANT TOPICS

Rope traction is obviously the main topic that both books have in common, but there are other related areas where comparison is possible. *Der neuzeitliche Aufzug* also covers areas which are not part of Donandt's dissertation, including a section contributed to the standardization of the lift designs.

4.1. ROPE TRACTION THEORY

In his forewords, Donandt writes that *"the previous publications do not offer sufficient background in form or content for calculation of elevator with traction sheave,"* referring primarily to literature concerning Koepe hoist systems and the framework of his dissertation is to correct this deficiency. The book by Hellborn and Hymans was not available to him at the time of writing.

4.1.1. THE FORCE RATIOS

It is interesting to note that already in his introduction to the traction theory, Donandt mentions the dynamic rope force ratios over the traction sheave, which indicates that this was an acute problem in traction dimensioning. It is also here that the first link to present day lift standards can be seen; both books conclude – based on slightly different argumentation - that a properly dynamically dimensioned lift can be safely overloaded with about $\frac{1}{3}$ of the nominal load and that if the lift speed is not too high (and overload condition not too frequent), the small possible slip during acceleration would not be harmful. This is still reflected in chapter of A17.1 concerning the carrying of one-piece load [11].

¹ The significance of rope traction of lifts at the time is highlighted by the fact that C.C. Clymer also published an article in November of 1927 in General Electric Review, which addressed the topic.

4.1.2. THE TRACTION FACTOR

Concerning the traction factor, Donandt commences from equations available for Koepe hoists at the time and uses a finite wedge-shaped linear object placed in a corresponding groove as a basis of his derivation. Donandt specifically mentions that he is aware of Hymans’s formula (Eq.1) from Hellborn’s article, but that the derivation was not commonly known.

$$\mu = \mu_0 \frac{4(1 - \sin\alpha/2)}{\pi - \alpha - \sin\alpha} \tag{1}$$

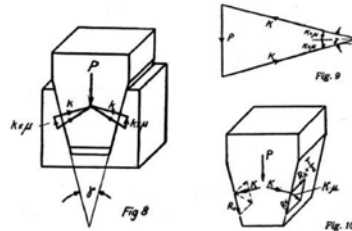


Figure 2 The engagement of wedge-shaped linear object placed in corresponding groove [3].

Donandt first formulates the equation for a round rope in wedge shape groove and then solves his equation for the specific case of circular rope seat (Eq. 2). In case of a rope positioned fully in the groove $\alpha + \varphi = \frac{\pi}{2}$, the equation can be simplified to Hymans’s formula (Eq.1).

$$\mu = \frac{4 \cdot \mu_0 \cdot \left[\sin\left(\frac{\alpha}{2} + \varphi\right) - \sin\frac{\alpha}{2} \right]}{\sin(\alpha + 2\varphi) - \sin\alpha + 2\varphi} \tag{2}$$

In comparison to *Der neuzeitliche Aufzug*, it is interesting to note that Donandt goes to some lengths to justify the usage of incompressible rope in his derivation by presenting an alternative derivation for a compressible rope, referencing an earlier publication “*Die Drahtseilfrage*” (*The wire rope question*) [12], where the topic is discussed, and later reflecting his results against both formulas. Figure 2 shows the engagement of a wedge-shaped linear object in a corresponding groove, which Donandt used in his derivation for elastic ropes.

The approach in *Der neuzeitliche Aufzug* is somewhat different. Overall, the topic of specific pressure in the groove is considered first and the derivation is based directly on a rope in an undercut groove. The basic definitions are listed in the beginning as follows:

1. The rope groove forms a non-elastic surface
2. The load does not cause any change in the cross-section of the rope
3. The rope can be considered as a smooth cylinder.

The fourth assumption is that vertical component of pressure must have the same value at each contact point because the vertical wear is observed to be the same everywhere (see 4.1.3).

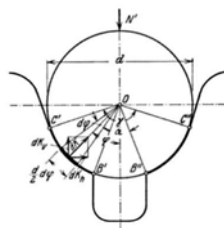


Figure 3 The determination of the size of the contact forces [1]

The derivation starts by determining the equilibrium conditions for a finite rope element, which is under the influence of the contact forces between rope and groove and the compressive force (Fig. 3). This gives the possibility to derive the magnitude of compressive force and, based on the relationship imposed by the four earlier assumptions, to determine the relationship (Eq. 3) between pressure, rope tension (S), groove geometry and the diameters of the rope (d) and the undercut traction sheave (D). To solve the formula for the friction force against rope slip (W), this is then integrated over the entire contact length (Eq. 4).

$$p = \frac{8 \cdot \cos \varphi}{\gamma - \alpha + \sin \gamma - \sin \alpha} \cdot \frac{S}{d \cdot D} \tag{3}$$

$$W = \mu_0 \cdot d \int_{\alpha/2}^{\gamma/2} \frac{8 \cdot \cos \varphi}{\gamma - \alpha + \sin \gamma - \sin \alpha} \cdot \frac{S}{d \cdot D} \cdot d\varphi = 8 \frac{S \cdot \mu_0}{D} \cdot \frac{\sin \gamma/2 - \sin \alpha/2}{\gamma - \alpha + \sin \gamma - \sin \alpha} \tag{4}$$

Since by definition the normal force over the traction sheave can be given as $N = \frac{2S}{D}$, the friction force is $W = \mu \cdot N$ and as $\gamma = \pi$ for a rope positioned fully in the groove, the later equation can be transformed using the equation given in Hellborn's article (Eq.1) for the relationship between actual and apparent coefficient of friction.

It is particularly important to note that the authors are critically aware of the limitations of their derivation. Firstly, they discuss the impact of the size of the undercut and conclude that with centre angle values above 120° the groove geometry does not correspond to the derivation anymore. Secondly, the influence of assumed rope shape versus the actual contact between the groove and individual wires within the rope strand is considered and it is proposed that a correction factor should be applied based on the construction of the rope.

4.1.3. THE SPECIFIC PRESSURE BETWEEN ROPE AND GROOVE

As mentioned, *Der neuzeitliche Aufzug* treats the topic of specific pressure before deriving the traction factor. The chapter starts by declaring that the destruction of the grooves is caused by wear, and wear is caused by rope creep and rope slip. It is also stated that since the vertical wear of the groove is the same everywhere, the vertical pressure component ($p = p_0 \cos \varphi$) must also be the same at each point of contact.

Since the presumption is that the wear is determined by the number of roundtrips, the lifts are classified in to four distinct groups depending on their usage. These classes are 1) Passenger lifts for 8-10 hours of usage per day, 2) Passenger lifts for intermittent traffic, 3) Goods lifts similar for intermittent traffic, but longer loading times and 4) Goods lifts that are used rarely.

Subsequently, the permissible surface pressure is given for each class based on experiments (Fig. 4), but the details of these experiments are not given. It is also stated that these limits apply for round stranded ropes with a Regular lay and that for Lang's lay these values can be exceeded by 25%.

Later, an adaptation of these limits was applied in German TRA 003 lift regulation [13] from where it got copied to EN 81-1 for a brief period between 1986 and 1989.

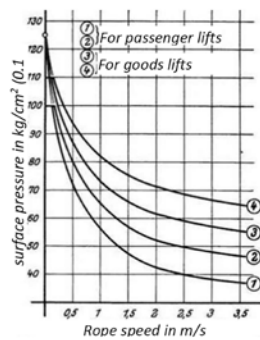


Figure 4 Permissible surface pressure between rope and groove for a round strand rope with Regular lay and groove rim from mixture of grey cast iron and scrap steel [1]

According to Donandt, the concept of limiting the permissible groove pressure was relatively new at the time and the conventional approach was to select quantity of ropes solely based on strength calculations. When Donandt was writing his dissertation, he did not have the full explanation of *Der neuzeitliche Aufzug* available, however he made some observations based on Hellborn's article. He was concerned that the pressure (at point $\alpha/2$) used in the derivation of the pressure formula is not changing in relation to the width of the undercut and he had doubts about the pressure distribution assumption. He also raises questions about the impacts of cross-sectional resistance, wire thickness and strand construction of the ropes, as well as the impact of the hardness of the sheave, but concludes that these questions can only be answered by obtaining more experimental data.

More significantly though, Donandt claims, based on his own experiments, that rope slip alone cannot explain the wear of traction sheave. For his tests, he attempted to create a rope seat in a traction sheave by slipping a rope over it but had great difficulties in achieving symmetric wear as seen in Figure 5. As a supplementary explanation he proposes that a part of the wear mechanism are the changes in the material due to load changes caused by the movement of the lift.

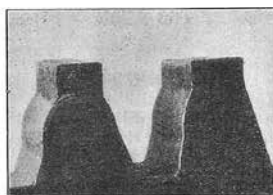


Figure 5 Asymmetric wear documented by Donandt [3].

But while there is some disagreement on the wear mechanism and on the determination of the permissible pressure, Donandt concludes that it was advantageous not to let the pressure become too high due to rope and sheave lifetime considerations.

4.2. ROPE SAFETY FACTOR

In the beginning of the 20th century the question 'which safety factor should be applied?' was very much open. Donandt reports that there was an on-going discussion in the German lift association whether to base the safety factor calculation solely on the tensile stress or to also take the bending stress into account. *Der neuzeitliche Aufzug* gives a table with a foreword that safety factors applicable in USA can be read directly from the maximum rope load curves. As reference, Grierson [14] reports that in England the safe working load was one twentieth of the breaking load and explains that the differences in safety factor are at least partly due to rope materials used in different markets.

Table 1 Rope safety factor according Hellborn and Hymans [1]

Lifting speed (m/s)		0.5	1.0	1.50	2.0	2.50
Min. safety factor:	Passenger lifts	8	8.6	9.2	9.7	10.2
	Freight lifts	7	7.6	8.2	8.65	9.1

The significance of safety factor in conjunction with the introduction of surface pressure limits is that both Donandt and Hellborn together with Hymans conclude that safety factor calculation becomes partially redundant if pressure limits are followed. Donandt goes as far as to formulate a relationship between the safety factor of contemporary German ropes and undercut angle for different d/D -ratios (Fig 6).

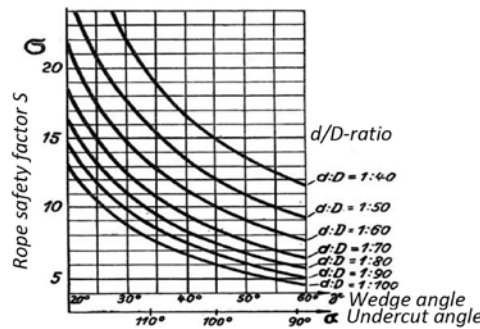


Figure 6 A safety factor chart for all loads and rope-to-traction sheave-ratios [3].

An interesting reflection to modern European regulations is that groove pressure is no longer considered, and it has been replaced by a complicated calculation for a minimum rope safety factor [15]. This compulsory requirement in practice only influences hoisting configurations with a large amount of relatively small pulleys, while in many applications, such as high-rise, only the absolute minimum safety factor of twelve has relevance. Also, this calculation does not consider decades of development in rope technology, which may lead to excessive groove pressure [16].

4.3. COEFFICIENT OF FRICTION

Der neuzeitliche Aufzug explains explicitly the difference between apparent and actual friction coefficient and how the relationship is formulated. As already mentioned, the formula (Eq. 1) was known to Donandt from Hellborn's earlier article. To verify their friction calculation method, Hellborn and Hymans present measurement results done with ordinary round strand ropes using two different sized traction sheaves with different undercuts (Fig. 7). For the rope slip results, the sliding speed was 2.5 m/s. Their conclusion of these results can be summarized as follows: The difference in friction between before and after the rope slip is due to lubrication, which is effective only after there is movement between the rope and the sheave and the tension ratio becomes independent of the load at relatively high loads due to the stiffness of the rope (the rope diameter used in the tests is not specified). Finally, they compare actual friction coefficient values from these calculated tests ($\mu_0 = 0.080$ and 0.083) to earlier tests conducted with semi-circular groove ($\mu_0 = 0.084$) and present this as proof of the correctness of their mathematical analysis.

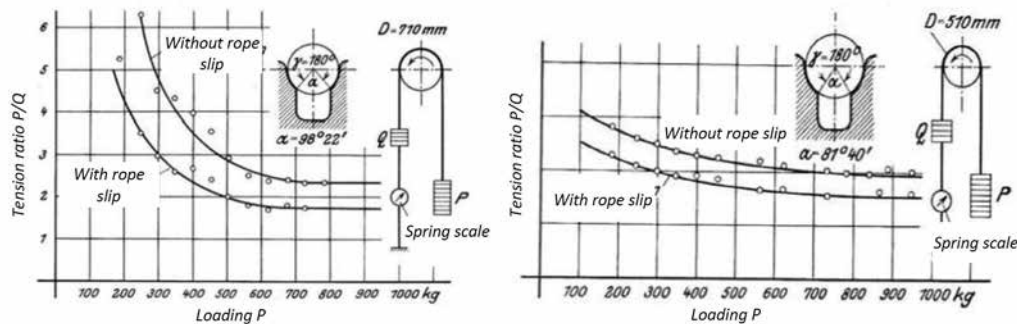


Figure 7 Friction test arrangement and results by Hellborn and Hymans [1]

While *Der neuzeitliche Aufzug* treats the topic of actual friction coefficient relatively briefly, a substantial portion of Donandt's dissertation is focusing on tests to understand the dependence of rope friction on four parameters: surface pressure, lubrication, sliding speed and surface quality. His test arrangement is in principle similar to Hellborn and Hymans, but one difference is clear from the onset; the diameter of the traction sheave is only 400 mm, and with a 16 mm rope Donandt is only able to achieve d/D -ratio of 25. But he states - in direct contradiction to Hellborn and Hymans - that the test results did not show that the rope stiffness would be influential even with small loads.

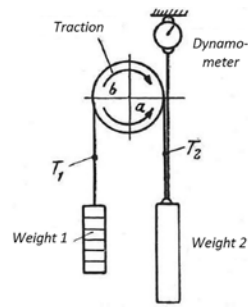


Figure 8 Friction test arrangement by Donandt [3]

Donandt makes the following prepositions based on these four testing parameters:

1. The question of the dependence of μ_0 on the diameter of the ropes and on the size of the support surface is the same as the question of the dependence on **the pressure**. In otherwise unchanged conditions, an increase of rope diameter or support surface will only result in a reduction of the specific pressure. The study of different rope diameters can thus be ignored.
2. Dependence of friction on the **lubrication** can only be significant for the state of rest. As soon as the rope begins to slide, the lubricants on the wires and the sheave will be displaced from the contact so that they become ineffective.
3. Concerning **the sliding speed**, it is known that the friction in rest is greater than in sliding. In the normal operation, the friction value at rest is decisive because the rope is in rest in relation to the sheave, but if due to acceleration or braking situation the ropes start to slip, the smaller dynamic friction applies, and it must be taken as a basis for the traction calculations.
4. **The quality of the groove surface** has an influence on the magnitude of friction. The reduction of friction due to running-in is relevant because the initially rough grooves will be smoothed by the ropes over time. The question of whether friction is dependent on the material of the sheave could be seen only when the pressure of the wires became so great that they left impressions in the sheave.

Again, Donandt's second claim is in direct contradiction to the statement by Hellborn and Hymans.

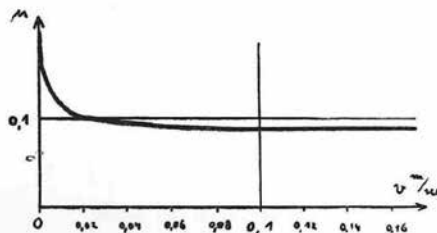


Figure 9 Dependence of friction on sliding by Donandt [3]

After conducting hundreds of individual tests, divided into 21 test sets in three distinct groups, Donandt made the conclusion that the static friction varied between 0.104 and 0.184 and sliding friction between 0.09 and 0.160 for rope speed exceeding 0.1 m/s (Fig. 9). And that the smallest of these values, $\mu_0 = 0.09$, should be used in calculations.

Here, it is interesting to note that according to Gibson the friction coefficient value published in *Der neuzeitliche Aufzug* was widely in use in the lift industry at least during the 1990s (Table 2) [16], and Donandt's value lived on, first in the German lift regulation TRA 003 [13] and later in the European standard EN 81-1:1985. The reason why Donandt's friction coefficient was abolished from later versions of EN 81-1 was the introduction of speed dependent friction coefficient formula, at least partly due to influence by KONE [17]. The speed dependency allowed initial friction coefficient value to be set to 0.1, which is close to Donandt's lower static bound.

Table 2 Rope friction factors by Gibson [16]

Source	μ_0
Otis	0.084
Haughton	0.084
Millar	0.084
Westinghouse	0.094
Schindler	0.094
Dover	0.100
EN 81-1:1985	0.090
EN 81-1:1998	0.100
EN 81-50:2020 ¹	
¹ Addition by Author	

4.4. DECELERATION AND ACCELERATION OF LIFTS

Determining the upper bound of the deceleration and acceleration of lifts is a relevant question when determining the needed traction. Also, before the age of computers, it was convenient to produce one calculation that would cover both static and dynamic load cases with the least amount of calculation, which resulted in simplified dynamic factor $\frac{g + b}{g - b}$, where g is the gravity acceleration and b is the acceleration or deceleration.

Table 3 Acceleration/deceleration in respect to lifting speed according to Hellborn and Hymans [1]

v (m/s):	0.65	1.0	1.5	2.0	2.50	3.0	3.5
b (m/s²):	0.65	0.85	1.15	1.40	1.65	1.88	2.10

Donandt was concerned in particular about the deceleration during braking as the lifts in Germany at the time were also stopped in normal operation by a mechanical brake, which could cause harsh stopping, whereas many contemporary American lifts performed gradual stopping using the motor. The claim is supported by the table from *Der neuzeitliche Aufzug* (Table 3), which gives very specific deceleration rates. After conducting a series of field measurements – including one notoriously unpleasant lift in Stuttgart - Donandt concludes that the maximum deceleration was 0.3 g, but that 0.2 g would be sufficient for traction calculation if dynamic friction coefficient was applied. It should be noted that Donandt's values can also be considered as maximum values for emergency braking condition.

By today's standards any values above ca. 1.4 m/s² would be considered excessive in normal use and thus the dependency between speed and acceleration given in Table 3 is no longer relevant.

4.5. DIMENSIONING OF OIL BUFFERS

Der neuzeitliche Aufzug contains a wide variety of topics, which are beyond the scope of Donandt’s dissertation. One of these topics, which should not be dismissed, is dimensioning of oil buffers, because of its long-lasting implications.

Already prior to the publication of *Der neuzeitliche Aufzug* Hymans had been actively solving design challenges concerning buffers [1] and had written about the buffer stops of lifts published in ASME Transactions in the previous year [18]. He also discussed at length the topic of buffers again in *The Electric Elevators, Book I* [19] in ca. 1930.

To start with, *Der neuzeitliche Aufzug* makes the statement that tests have shown that greater deceleration than 2.5 g causes discomfort to passengers, and that decelerations above 3 g are considered dangerous, but no further details are provided. Later, in reference to oil buffers, it is mentioned that in general the buffers are designed to decelerate the maximum rated load with an average deceleration of 1 g. Some contexts where these limits have appeared are listed in **Table 4**.

Table 4 Some buffer deceleration limits

Deceleration limit [g]	Source	Author	Year
"Equal to velocity height" = 1.0 g (?)	Passenger Elevators	Author Brown	1904
64.4 ft/s ² = 2.0 g	Electric Elevator Equipment for Modern Buildings	Grierson	1924
1 g (average) 2.5 g (maximum)	Der neuzeitliche Aufzug mit Treibscheibenantrieb	Hellborn, Hymans	1927
80.5 ft/s ² = 2.5 g	Electric Lifts	Phillips	1961
25 m/s ²	NEN 1081 Safety regulations for electric lifts	Nederlands Normalisatie- instituut	1971
1 g (average) 2.5 g (peak)	Der Aufzugbau	Franzen, Englert	1972
9.81 m/s ² (average) 24.5 m/s ² (peak)	ASME A17.1/CSA B44	The American Society of Mechanical Engineers	1971 2019
1 g (average) 2.5 g (peak)	EN 81-1 EN 81-20	European Committee for Standardization	1986 2020

Indeed, 2.5 g was regarded as the safety limit for passengers and the 1 g limit was needed to ensure that the deceleration of the descending body matches that of the ascending body. The significance of this can only be understood by reading the earlier ASME paper by Hymans, which highlights the importance of ropes slipping during buffer run to maintain a safe top clearance and the significance of slack hoist rope produced as a result of buffer run.

Parallels can be drawn from here to Donandt’s 1963 article *“Die Bremskraft der Fangvorrichtungen von Schnellaufzügen und das Springen der Gegengewichte beim Fangen”* (*The braking force of the safety gear of high-speed elevators and the counterweight jump during gripping*) [20] where he analyses the same phenomenon from the perspective of safety gear engagements. The conclusions concerning counterweight jump have defined the engineering of high-speed lifts to this day.

It is also worthwhile to consider that due to the influence of *Der neuzeitliche Aufzug* the 1 g limit for buffers became the industry practice and, in addition, most likely directly affected the requirement for safety gears [21].

4.6. STANDARDIZATION OF LIFTS

The subtitle of Hellborn's and Hymans' book is "*Charakterisierung, Theorie, Normung*" (Characterization, theory, standardization) and as the subtitle suggests, one main theme is to explain the impact of traction sheave drives to the standardization of lift design. The section – probably written mostly by Hellborn – explains the "typification", which is the principle of constructing a series of complete products such as motors, controls, safety gears, etc., and the "standardization", which aids the economical selection of individual parts. The topic had already been introduced in Hellborn's 1924 article and in modern terms the approach could even be described as "systems engineering" as the aim is to design efficient lift systems. Overall, the possibilities for standardization were one of the reasons why traction lifts were such a paradigm shift and Hellborn's analysis would merit a much wider treatment than what is possible here.

5. DISCUSSION

Although the traction lift had already existed before the books by Hellborn, Hymans and Donandt were published in 1927, they acted as a catalyst in the major transition within the lift industry, by making the basic dimensioning principles available for a wider audience. The age of drum lifts was decidedly over.

Several of the dimensioning principles introduced in these books have lived on to this day. This was also influenced by the fact that Hymans and Donandt assumed significant positions in the lift industry in later years and were both involved in the development of lift safety standards.

Admittedly, these principles have *stood the test of time*, but it should also be recognized that these old principles should not go unchallenged. Already in 1927 Donandt disagreed with some of the claims made by Hellborn and Hymans, and the evidence to support some of the basic assumptions was not properly presented – at least by scientific criteria. On the other hand, one could also argue that on some points the original wisdom has been misrepresented in later years.

In the century after the books by Hellborn, Hymans and Donandt, the lift industry has faced other paradigm shifts, such as the introduction of machineroomless lifts and coated suspension members. The recent trend towards eliminating or minimizing pit and headroom heights may also become such a game changer – not to mention the impact of digital transition.

As general technology evolves and the requirements change, we must be ready to challenge the old assumptions. But to do that, one must first recognize why certain things have been the way they are. This is why it is so important to go back to the source - and therefore *Der neuzeitliche Aufzug mit Treibscheibenantrieb* and *Über die Berechnung von Treibscheiben im Aufzugbau* are still relevant today.

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BIOGRAPHICAL DETAILS

Jaakko Kalliomäki is currently working as Technical Product Owner of high-rise elevator core technologies at KONE Corporation. He has a master's degree in Mechanical Engineering from Helsinki University of Technology and 15 years of experience is high-rise lift engineering. His expertise areas include Systems engineering, hoisting dimensioning, seismic lift design and building sway. He is also a keen lift history enthusiast.



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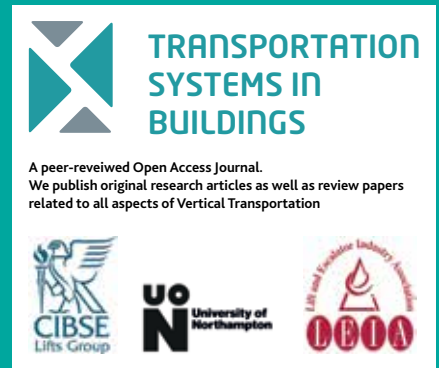
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TED BARKS

WITH THE LIFT INDUSTRY MENTAL HEALTH CHARTER

BARKING ABOUT FRIENDSHIP

Our 'Ted Barks' column focuses on the importance of prioritising our mental health. Our newest columnist, Ted, will look at the various mental health conditions and struggles that many of us will recognise, and how we can start to address them.

WHO IS TED?

I am a French Bulldog who loves to spend time with my owners, and has anxiety when left alone or I find myself in a new place. Us French Bulldogs are often referred to as 'Velcro dogs', as we like to stick to those we love and require attention 24/7, as it should be!

In this month's column, we've had some canine collaboration to look at the benefits of animals to our mental health.

ANIMALS AND MENTAL HEALTH

We've all heard the expression that dogs are, 'a man's best friend,' but I prefer the term, 'a person's best friend,' as I enjoy meeting and socialising with everyone! Animals in general are well known for helping with improving a person's mental health – why?

You may think we only sleep, eat, sleep, run around aimlessly, have the odd sprinkle and sleep some more for most of the day. While most of this is true, animals, and dogs specifically, can bring great joy to individuals and families.



Here we can see the very handsome Teddy Jones and family. Teddy is a lift industry dog like me, his owner is none other than Richard Jones, Managing Director of Fujitec UK, and has appeared in Lift Industry news before! You can see just how much joy dogs can bring to a family environment.

HOW CAN DOGS IMPROVE MENTAL HEALTH?

I recently took a trip to my local vets, where I met a specialist on dog behaviour. Apparently, I'm too possessive, but I still believe, if it's in my mouth, whatever it is, it's mine. I'm really not sure what the issue is... I met a lady called Patricia McGrady from an organisation called 'Be More Dog,' who is an expert in dog behaviour. Patricia is a certified full member of the Canine and Feline Behaviour Association (CFBA), which is recognised by the Pet Behaviour Council. So I suppose maybe she might be right about me... She shared her thoughts on the benefits of dogs to mental health.

Studies have shown that owning a dog can reduce the risk of cardiovascular disease and promote better physical and psychological wellbeing, particularly in older people. When we take our dogs out for walks, we are not just getting physical exercise, we are talking to other dog owners while being out in nature. This helps with loneliness and isolation for many. Our dogs never judge, they are forgiving and they are always there for us with unconditional love, there are not many humans that can match this!

Dogs have the biggest heart to body mass ratio of all mammals, at around 6% compared to 0.6% in most other mammals, including the elephant. This may explain why we feel such an emotional connection with our dogs. Have you ever noticed how your dog recognises your mood? They are incredible at reading our body language and our chemical output, so they know just how we are thinking and feeling, even if we try and hide our emotions.

I, for one, would be lost without a dog companion in my life. Our dogs give us so much and desire such little in return. They are truly remarkable animals.



Patricia and her dog, Buddy.

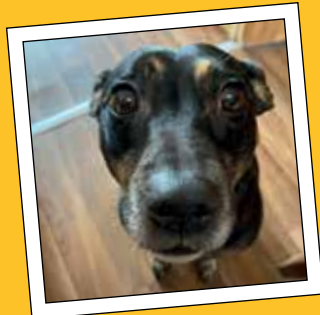
If you think your best friend needs a little help, find out more about Patricia McGrady at bemoredog.co.uk.

THE FACTS

Studies have shown that dogs reduce stress, anxiety and depression. We can help people feel less lonely, exercise more and improve overall health and wellbeing. In fact, people with dogs tend to have lower blood pressure and are less likely to develop heart disease. Also, stroking our lovely soft fur has been shown to promote the release of serotonin, prolactin and oxytocin, hormones which play a part in lifting your mood. So I highly recommend finding a dog to stroke today.

CATCHING UP WITH INDUSTRY FRIENDS

Looking around our industry, there are many lift dogs who help with mental health and bring great joy! Below are a few of our lift dog friends.



This is good dog Gizmo, best friends with Stew Pennykid, Divisional Director at Cento.



The very regal-looking Karma lives with friend Steph Murphy, Service & Repair Manager at Cotswolds Lifts.



Handsome Nero belongs to Carey Oaks, Director of Operations at Knowsley Lift Services.



Here's Sapphire enjoying a good sniff around the woods. Michael Burke from the Elevator Consultancy has the privilege of owning lovely Sapphire.



Two friends, Purdey and Bichon, sitting so nicely for Jessica McDonnell from J&L Lift Components. How exciting to be an office dog!



It's me, Ted! With my friend Milo.

The *Lift Industry* Mental Health Charter

The Lift Industry Mental Health Charter

is an initiative which is focused on bringing together the lift industry to support mental health.

This includes all lift companies, lift consultants and lift suppliers across the lift industry and their employees. Working together to

support the people within the industry with their mental health will make the industry a safer and more supportive place to work.

1 in 5 have suicidal thoughts over the course of a lifetime

1 in 6 experience common mental health problems every week

1 in 4 experience mental health problems every year

Clear your mind,
You're not alone
Find help here!



www.liftmentalhealthcharter.com

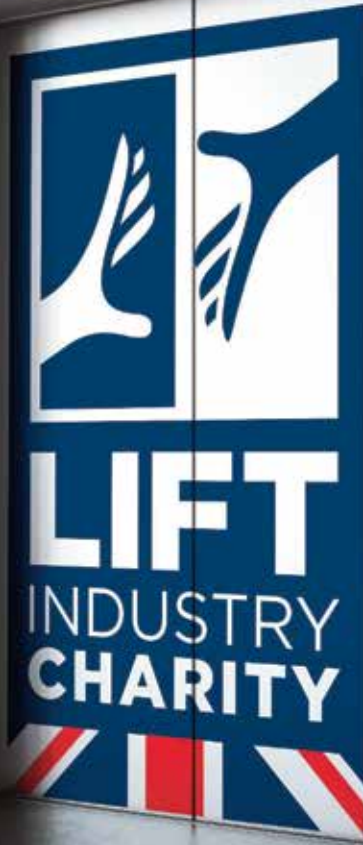


Can we help...

Are you employed in the Lift industry?

Have you, or someone you know, had a works related accident?

Did you know there is financial help available?



The UK Lift Industry Charity

Run by Lift People for Lift People

The UK Lift Industry Charity Mission... The relief of financial hardship and provision of appropriate support where required to industry colleagues and their families who have been injured whilst working or employed within the industry.

Can we help you, can you help us, would you like to join in the next **2023 Cycling Challenge** just email reiss.stygal@aa-electrical.com www.liftindustrycharity.co.uk

The Charity has made numerous donations to individuals and the families of individuals who have been injured or sadly killed, whilst working in the Industry. We are continually looking for opportunities where we can assist.

Thank you to all The Lift Industry Karting Challenge sponsors, donors & participants



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Use of conference room and kitchen/breakout space, full day, 08:00 to 18:00	£275.00
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Our hydraulic and MRL lifts are also available separately for R&D projects, please contact us for more information.



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A LIFE IN THE DAY

Ducking
around with
Kirstie Horsler

We talk to Kirstie Horsler
about a typical day,
involvement in the community
and why ducks matter.



TELL ME ABOUT THE JOURNEY TO YOUR POSITION TODAY AND WHAT DREW YOU TO CREATE YOUR COMPANY IN 2012.

My background is in the motor industry, but the connection between cars and lifts is very close. I actually started working for another company in the lift industry without knowing anything about lifts! I was really fortunate, I worked through many different departments, from quality assurance through customer services and then sales. The drive to create Horsler Lift Services came from the fact that I became frustrated in my role about the lack of tangible and effective changes that I could make. An overnight brainwave led me to found my company.

To begin with, it was just me and a couple of engineers that sub contracted for me. At the time, the economy wasn't great, and people said I was either brave or mad, but it gave customers a different choice. I set out to create something that was really personable and approachable, and could make a real impact within the lift industry.



Kirstie with Karen Eeles and JD Viette of Aspire

WHAT'S INCLUDED IN A 'TYPICAL DAY' FOR YOU?

I'm very hands on, even as MD. I think the dream of being a bit more removed is just that – a dream! I'll do anything from emptying the bins to taking parcels to the post office and washing up. We do have a structured day, however, starting with a diary meeting in the office, then I'm in touch with all our engineers throughout the day. As we've opened an office on the Isle of Wight, I also spend a fair amount of time raising our profile and dealing with our new business here.

HORSLER LIFTS IS KNOWN FOR LIFT REPAIR, SERVICE AND MODERNISATION SOLUTIONS – BUT WHAT MAKES YOU UNIQUE?

Hydraulic systems and lifts are very specialist and I have some amazing talent and experience on my engineering team so that does set us apart. I appreciate there is more hydraulic choice than there used to be, but I feel what makes us unique is our commitment to what we do, the service we offer and the repairs and modernisations we complete. I am the first to admit we don't always get it right, sometimes that is just life in a service industry with so many external factors that are outside of our control, but we are totally committed to providing an excellent service and striving to do the best that we can. Every day is a learning day and the opportunity to improve.



WHAT ARE HORSLER LIFTS' TOP PRIORITIES FOR THE REST OF 2024?

We're in the process of bringing in new team members, mostly on the engineering side, so that's a major focus for this year. Also we have our 'Duck Goals' for this year and we're preparing for Liftex 25. We're seeing real growth and development across our teams in many areas, but a highlight has been seeing the ladies in our office team complete LEIA courses, and so I'm really excited to see their growth and achievements as a result of that this year. We're also looking to explore how we can welcome apprentices to Horsler Lifts.

WHAT'S THE BEST THING ABOUT YOUR JOB? AND WHAT DO YOU LOVE MOST ABOUT THE LIFT INDUSTRY?

I love the fact that I can make a difference – I make decisions about our company that can change our direction and have a real impact. I love how diverse the lift industry is, how busy it is and the variety of people we deal with. We work with everyone from sole traders through to large organisations and I find it a very exciting industry. It never bores me, every day is exciting!



Bear & Teddy at work

CAN YOU EXPLAIN YOUR DUCK MASCOT AND WHAT THAT MEANS TO THE COMPANY?

The duck was born in 2016 for the Liftex exhibition in London where we had our first stand. We're essentially a labour provider offering a service so we didn't have products as such to showcase. Instead, we themed our stand around the idea of travel and gave away luxury travel goody bags with a toothbrush, an eye mask, ear plugs and a rubber duck! From then on it has become our mascot and we now have 12 versions of our duck, from the original, to a travel duck, valentine's, Easter, Halloween and more, and we're developing a social media presence for it as well - people love to show us all the places their duck has been. It's also been a great way to support charities; we've sponsored duck races and summer events for Aspire Ryde, a community hub that supports the Isle of Wight in many ways. We're the company that 'Always give a duck'. We're here to support our customers but we also want to be part of our local communities and offer help everywhere we can.

WHAT DO YOU DO TO SWITCH OFF FROM WORK?

I have to force myself to switch off! But as a family we made the decision to move to the sea in 2020, and if it's a sunny day I have to be outside. We spend a lot of time on the water and I just love stepping outside and being on the beach. Life is better by the sea.

WHAT'S THE ONE THING IN YOUR LIFE YOU COULDN'T LIVE WITHOUT?

It's got to be family. I work with my husband, so our work and personal life is totally intertwined. My eldest has just turned 18 and my youngest is 13, being a mum and what they've taught me is priceless. Seeing them grow up and being part of their journey is a privilege.

AND FINALLY, WHAT'S NEXT FOR YOU?

Duck domination! I'd love to see Horsler Lifts continue to grow and build that legacy. Hopefully we've sown the seeds for a successful future. I'd love to continue to put the right people in the right places for the right reasons. I'm still grateful for every opportunity and fully believe in the power of positivity.

We're the company that 'Always give a duck'. We're here to support our customers but we also want to be part of our local communities and offer help everywhere we can.

The Lift and Escalator Library

» www.liftescalatorlibrary.org «

Is an online library for the lift (elevator) and escalator industry.

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Today we've jetted off to the other side of the world and have found ourselves waiting for the lift in the Mandalay Bay Hotel in Las Vegas. We've met Danny Garaway here, Director and Founder of Target Lifts, to take in the sights and sounds of the Vegas strip.

ELEVATOR PITCH

DOORS CLOSING, GOING UP...

CAN YOU BRIEFLY TELL US ABOUT YOUR ROLE?

I'm the Director/Owner of Target Lifts, along with Tony Howell-Smith. My responsibility is to ensure the company is operating as it should, making sure we cover every aspect of health and safety and compliance within the industry. Growing the company, making new and maintaining existing relationships is something I do every day.

WHAT LED YOU TO FORMING YOUR COMPANY?

I've always been keen and ambitious in everything I do, always hard working and wanting to do better. I was fortunate to have a really good apprenticeship, then went self

employed as a sub-contractor and was working for the same companies as Tony. We ended up helping each other out and working together, and straight away it was obvious we had very similar views on customer service. Back then, customer service levels and communication were deemed as being pretty poor in the lift industry – we knew we could deliver better, so we did. Since then, we've continuously improved in providing our customers with the best level of service we can.

CAN YOU OUTLINE YOUR ETHOS OF 'AIMING HIGHER'?

Always trying to improve every service of the lift industry that we are providing for our clients. We're always learning, very customer service-oriented and trying to do things

differently from our competitors. If you go to a Target Lifts job, you should be able to recognise it's one of ours because of the quality of work. We carry that ethos through with our members of staff and engineers in the field. We're always aiming for continuous improvement – we never settle.

WHAT'S THE BEST THING ABOUT YOUR JOB?

Seeing the people around me achieve their own success, as well as team success – I love that – seeing people's job satisfaction. I love watching someone take on a new responsibility and work hard to achieve success – witnessing someone else's achievement is brilliant.



ANY PROUDEST ACHIEVEMENTS?

In our business, both Tony and I are experienced in delivering modernisations and installations, however one of us had to take responsibility for looking after the service side of the company as it grew. It was my task to build the company's Service Department whilst maintaining our excellent reputation. This is something I am particularly proud of.

For example, I am really proud of our service contract with Knight Frank Promise, we look after a lot of their commercial buildings in London. We were initially awarded a contract for 3 years for half the London portfolio, and then awarded the full portfolio for another 3 years, and we're now in our sixth year with them, looking after over 200 lifts. It's a contract with rigorous KPIs and challenging SLAs and demands exceptional levels of communication. We have grown together in partnership and I am very grateful for the opportunity.

WHAT ADVICE WOULD YOU GIVE TO SOMEONE ON THEIR FIRST DAY OF WORK AT TARGET LIFTS?

I will only employ someone who I know will work well together with our team, that's crucial. So if it was someone with plenty of experience in the industry I'd say, speak to other people, never feel shy to ask questions. Tony and I are there to support them through their growth and journey with Target Lifts. We are massive supporters of mental health organisations like Mind and the Lift Industry Mental Health Charter. We promote great teamwork and support – our door is always open. For a newbie, maybe an apprentice, my advice would be to listen, always be on time, always work hard and most importantly, leave your phone in your pocket and do what you're asked.

OUTSIDE OF WORK, WHAT DO YOU ENJOY DOING?

I love spending time with my family. I'm very lucky to have 4 beautiful children and a very supporting partner. I'm very sociable, enjoy golf, supporting Chelsea FC and I love ticking off big sporting events around the world.

WHERE IS YOUR FAVOURITE PLACE IN THE WORLD AND WHY?

Stamford Bridge, the home of football!! I've grown up there, I used to go there with my brothers and still go now with friends and clients. It's given me some great memories over the years.

Away from home, my favourite place is Barbados – the people, the food, the weather, you can't beat it.

IF YOUR BEST FRIEND DESCRIBED YOU IN THREE WORDS, WHAT WOULD THEY CHOOSE?

Generous, reliable and passionate.

DO YOU HAVE A NICKNAME AND IF SO, WHAT IS IT AND WHY DID IT STICK?

Danny the Finger – over the past year or so, every time I employ someone, I have a photo with my finger pointing at them. I picked it up from Eddie Hearn 'the boxing promoter' – I was once mistaken for him and I thought it would be a good idea to copy what he does with his new boxers! People now like buying me finger-related objects, things like foam fingers and poseable wooden hands! It's stupid but I enjoy it.

WHERE'S YOUR FAVOURITE PLACE TO EAT, WHAT ARE YOU EATING AND WHO ARE YOU TAKING WITH YOU?

Sexy Fish in Mayfair, I love sushi, it's my go to. I'd have to take the Mrs – we've got a 1 ½ year old son so date nights are rare these days!

AND FINALLY, IF YOU HAD TO CHOOSE YOUR FAVOURITE LIFT, ANYWHERE IN THE WORLD, WHICH ONE WOULD IT BE?

This glass lift on the outside of the Mandalay Bay is incredible. At night the view down the Strip is just something else. I remember after my first ride, I just wanted to go again! Although when it comes to engineering, it's got to be the Eiffel Tower. I went there with my son, and made him walk up to just look at the engineering. The feat to get it installed, and then maintaining it now, it's fascinating.

Well, after taking in that amazing lightshow down the strip, I'd say it's high time to find some sushi. Thanks to Danny Garaway for sharing his thoughts with us.

LETTERS FROM THE PIT

John is Lift Industry News' very own agony uncle and is here to support you when your vertical transportation relationship is going through a bad patch.

WISH TO ASK JOHN A QUESTION »

www.liftindustrynews.com/dearjohn or scan the QR code.



Paying less for maintenance in order to balance a service charge budget is a false economy.

DEAR JOHN

Question: I have recently had some complaints from tenants about the reliability of the lifts in my building. The lifts are only five years old, but despite regular maintenance, breakdowns are occurring more frequently. Is that normal?

JOHN SAYS

From your question I assume that you are a landlord or a managing agent so my response may not be what you wish to hear. There are numerous reasons for lifts to breakdown and not all are related to maintenance.

First of all, ensure the complaints from tenants are justified and clearly evidenced so trends can be monitored. Misuse is a common cause of lift breakdown. Assuming there are obvious issues then below are some regular experiences:

- a. Poorly selected and specified lift equipment from the outset. "Not fit for purpose" is a common phrase banded around relative to lifts however it is nigh on impossible to define and apply the term with respect to passenger lifts. Quite often (Design & Build contracts especially) developers will request costs or tender returns based on quite simple requests e.g. 2 x 8 person passenger lifts, with no real indication of quality

of equipment, origin or crucially the future maintainability of the equipment. The result is the building may be equipped with low-budget lifts from a less than reliable source with limited maintenance support.

Quite often this scenario requires quite radical solutions such as control system replacement moving to a generically available system supported in the UK. Door operating systems can also be a source of breakdown and again full or partial replacement may be the only solution.

In order to avoid the above be mindful of the lift equipment procured at development stage and seek independent professional advice before letting the QS simply meet the development budget which may already be ill-informed.

- b. Assuming the lifts installed are of a merchantable quality, have been well constructed and tested to the required standards, then regular maintenance may still be equipment related. All new lifts should carry a 12 month warranty and defects liability period. At the end of this period many landlords will default to their 'bulk' lift maintenance provider

who may not have the skills or in-house knowledge to maintain the equipment. This can result in missing such things as software upgrades and maintenance methodology being overlooked. In turn this may result in mal-adjusted equipment which breeds unreliability.

Solution: In the first instance you may wish to request an extended warranty period which should encompass a comprehensive maintenance contract provided by the original installation company. This should ensure any early issues with installation and ongoing maintenance are ironed out early in the lift's life cycle.

- c. There is a wider issue relating to ongoing maintenance of lifts and the industry's approach to 'remote monitoring' as opposed to hands-on servicing. My advice would be to treat your lifts in the same manner as your car (or fleet of cars). Ensure the maintenance provider is competent, well versed in the equipment installed (the original equipment manufacturers are usually a good starting point if possible). If necessary employing an independent consultant may be an option in order to ensure any underlying problems are identified and contractor selection is appropriate for the equipment installed. A well-qualified and experienced consultant can advise on appropriate maintenance providers and also conduct annual auditing to complement the statutory LOLER examinations.

A note of caution on the consultancy route. There are very few barriers to entry for lift consultants and therefore try to seek references from known and trusted sources. Many 'consultants' can come from commodity sales or non-

technical background which on occasions can be costly and counterproductive.

And finally cost,

- d. Paying less for maintenance in order to balance a service charge budget is a false economy. Tendering contracts annually and appointing the lowest bidder is commonplace (especially in the public sector). This can lead to inconsistency and quite possibly compromised safety of the lift(s). Arrive at a suitable maintenance provider, build a relationship and pay an acceptable premium. Being able to satisfy the questions on a PQQ or being on the list of a percentage grabbing 'procurement club' is again false economy.

The lift industry can be a prime example of 'getting what you pay for.'

JOHN BENTLEY

John is an established professional within the lift industry, with over 42 years of varied management and technical experience with a specific interest in quality service delivery, sympathetic lift modernisations where viable, and the development and adaptation of modern technology and design installed in existing environments.

His career started with H&C Lifts/Dover Elevators (USA) and in 1998 he established his own contracting business, trading as ANSA Elevators Ltd. – now recognised as one of the leading independent lift engineering companies in the UK. Since 2015 he has been part owner of LECS (UK) Ltd employed as a Director and Project Engineer covering all aspects of building transportation design and maintenance. He provides the company with all lift traffic analysis support along with expert witness information gathering and reporting.

John believes you never stop learning, so is currently studying Lift Engineering at the University of Northampton.



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THE STUCK IN A LIFT BIG QUIZ



Stuck In A Lift is a fun podcast to help you learn about different areas of the lift industry. Whether you are already part of the lift family or looking to join us, our podcast takes you through various job roles and businesses in the industry by the people doing the job...

We chat with some well known people in the industry and learn about their career paths and unexpected experiences along the way.

If you've missed an episode, head to **Spotify or Apple Podcasts** to listen!

<https://apple.co/3UHxgiD>

<https://bit.ly/49rHjgo>

Season 2 started on February 14th featuring Danny Garaway MD of Target Lifts- AND our Elevator Pitch interviewee in this edition!

And to whet your appetite and see how brilliant you all are, here's a clue for each of the podcasts so far - can you match what they said to the person and the company?

Behind Lift Door # 1: This Journey is NEVER ending

The interviewee will always go for the bullseye for her company

Behind Lift Door # 2: That one time I measured a lift WRONG!

Something dropped for this General Manager

Behind Lift Door # 3: I have my coffee PSYCHO black

It's the view of this sales team manager

Behind Lift Door # 4: Who is better at the cup song? ME!

Her co-ordination is Definitely worth Keeping

Behind Lift Door # 5: My Heart will go on – Celine Dion!

Near, far, wherever you are, this co-ordinator delivers beautiful accessibility

Behind Lift Door # 6: Come Fly with me, let's Fly, Let's Fly away

This person's flights may have taken in Egypt, Thailand and Kenya.

Behind Lift Door # 7: Being kidnapped in Paris was NOT my plan!

This person is incroyable et gagnante - time to get the French dictionary out!

Behind Lift Door # 8: Did someone say Hollywood?!

I Never turn Left on a plane - that was the old job for this person.

Behind Lift Door # 9: I'm a Lift Engineer, get me out of here!

A jewel in the team at a company that has been around since 1919.

Behind Lift Door # 10: Learn to dig deep when money becomes a struggle

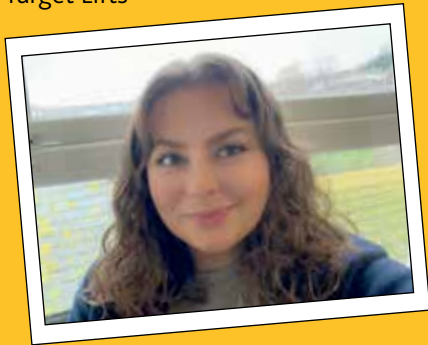
This MD is going UP!

Behind Lift Door # 11: Another connection to shhh!

This co-ordinator will join things together for you



Identity 1: Georgia Shepherd,
Trainee Technical Sales Associate at
Target Lifts



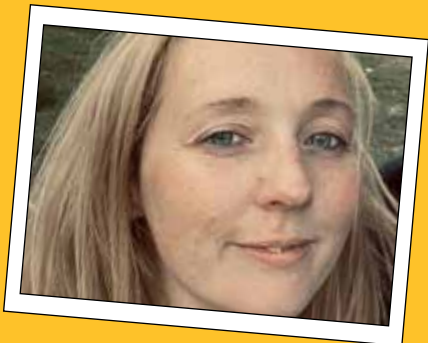
Identify 5: Faye Bryant,
Project co-ordinator at Lyfthaus



Identity 9: Gemma Moore,
Account Manager at Dewhurst



Identity 2: Jocelyn Cole,
Goods Lift General Manager at
penny Hydraulics



Identity 6:
Karen Hughes,
Project Manager at TKE



Identity 10: Harriet Taylor,
Managing Director of Elevate UK



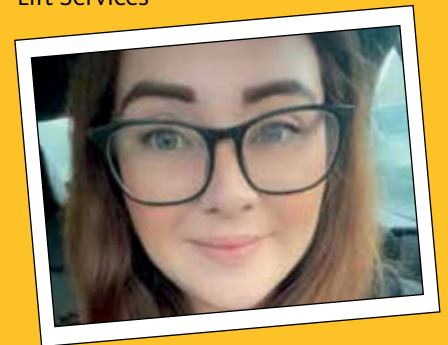
Identity 3: Kerry Willis,
Sales Team Manager at Aspect



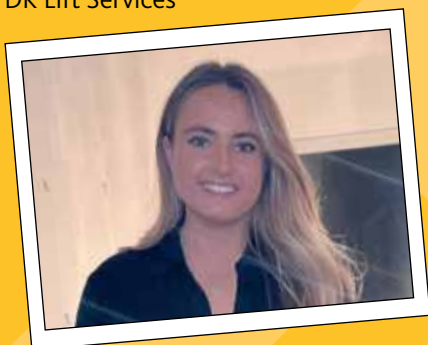
Identity 7: Jools Black,
Business Development
Manager at A&A



Identity 11: Amy White
QESH Management/ Platform Lifts
Project Co-Ordinator at Alliance
Lift Services



Identity 4: Olivia Edwards,
Repairs & Maintenance co-ordinator at
DK Lift Services



Identity 8:
Pat Reading,
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