

IN PARTNERSHIP WITH **RAIL**



INSIDE TALGO

UK market ambitions ■ Plans for Scottish factory ■ Attracting and nurturing talent
■ Technology and innovation centre ■ Very High Speed Trains for the UK



Talgo

Meet Avril

Quiet, Clean, Livable Mobility.



Welcome

Talگو moving to the UK is not a move being made through nostalgia or for the love of the country - the creation of two sites here is vital to the growth of the business.

In Spain there are two factories - one in Rivabellosa (in the Basque Region) and the other at the headquarters in Las Matas (near Madrid).

These facilities play vital roles in the company's global expansion. And recent contract wins for 100 new trains for Germany as well as new trains for Denmark and Egypt show that Talگو is well-placed to bid for, and win, major international deals.

However, the Spanish sites will soon be at full capacity, and that is where the UK comes in. There is a belief that Britain is perfectly positioned to serve many markets across the globe, including the Americas, Africa and Australasia, as well as closer to home in Ireland, Europe and, of course, the UK.

The political uncertainty over Brexit and leaving the European Union does not affect the decision because many of the deals could be with non-EU countries.

Another factor that removes the threat of Brexit is that Talگو wants to create a supply chain in the UK and to carry out true manufacturing.

We do not believe in assembling trains from overseas kits of parts; rather we intend to use the local supply chain to provide (as

much as possible) the materials needed to construct the various products - and where this is not possible, we will encourage new suppliers.

Likewise, Talگو has a lasting commitment to training staff, and offering apprenticeships. These offer people the opportunities to work on major global projects, to learn new and vital engineering skills, and to work for a business that truly believes in innovation.

Talگو will also seek to retrain or upskill people with transferable skills, as the job market changes.

The Training Research and Development Centre that will be constructed near Chesterfield is a further testament to Talگو's desire to create a true footprint in the UK. Working with UK businesses and education centres, we will look to carry out research at the site, not only for ourselves, but for the rail industry in general.

Please remember that Talگو is not just here for high-speed rail, but for many other projects. Our portfolio is wide and we hope to be able to import our expertise to the UK, while exporting new trains from the UK to all corners of the globe.

Talگو, we hope, is here to stay.

Carlos Palacio Oriol
President, Talگو



CONTENTS

40 Ambitions
Talگو is not just here for high-speed rail - it wants to become firmly established in the UK.

44 Longannet
Talگو reveals the full extent of its plans for two UK sites as Longannet continues to progress.

46 Talent factory
How Talگو plans to introduce a cultural ethos to attract the UK's best talent.

48 Chesterfield
Talگو's plans to open an 'Innovation Centre' for training, research and development.

50 Innovativon
Innovation underpins Talگو's bid to develop a high-speed train for the UK market.

EDITORIAL

Managing Editor: Nigel Harris
Head of News: Richard Clinnick
Features Editor: Paul Stephen
Production Editor: Mike Wright
Art Editor: Charles Wrigley
Sub-Editor: Richard Hampson
Managing Director: Tim Lucas

ADVERTISING

Account Director: Julie Howard

Talگو

www.talگو.com

Talگو

SPANISH AMBITIONS

Talgo isn't just looking at the UK as a place for 'True Manufacturing' - the company wants to help develop UK manufacturing regardless of Brexit

Talgo may be a new name on the block when it comes to manufacturing trains in the UK, but the company has an established history dating back to 1942.

Even before then, its founders were looking at ways to innovate, having witnessed a mail train accident. This led them to offer articulation and no axles, but it took a lot of work to convince the Spanish railway authorities that this was a reliable method.

Once it was proven, and awards were won, the company grew from strength to strength. In its home country of Spain, passengers are known to say they are catching "the Talgo" when they discuss using the train - has that ever been heard here? Brand names, perhaps, but not the actual manufacturer.

And there is a good reason for that. The company delivers what it sets out to do. Its highly skilled workforce produces various trains, from very high speed to commuter products which operate across the Iberian Peninsula.

The company also exports, with an industrial presence in 28 countries - a figure set to rise. Currently, the company's fast, lightweight products can be found in Spain, Germany, Kazakhstan, Uzbekistan, Russia, Saudi Arabia and the United States. Talgo has already won deals this year to supply trains for Egypt and Uzbekistan, as well as an order for 100 locomotive-hauled trains for Deutsche Bahn in Germany. Now it wants to add the UK to that list.

Within Spain, Talgo is completing the first of the new AVRIL trains it's building for operator Renfe. These trains took about ten years to develop, and with construction starting last year, the first sets will enter traffic next year.

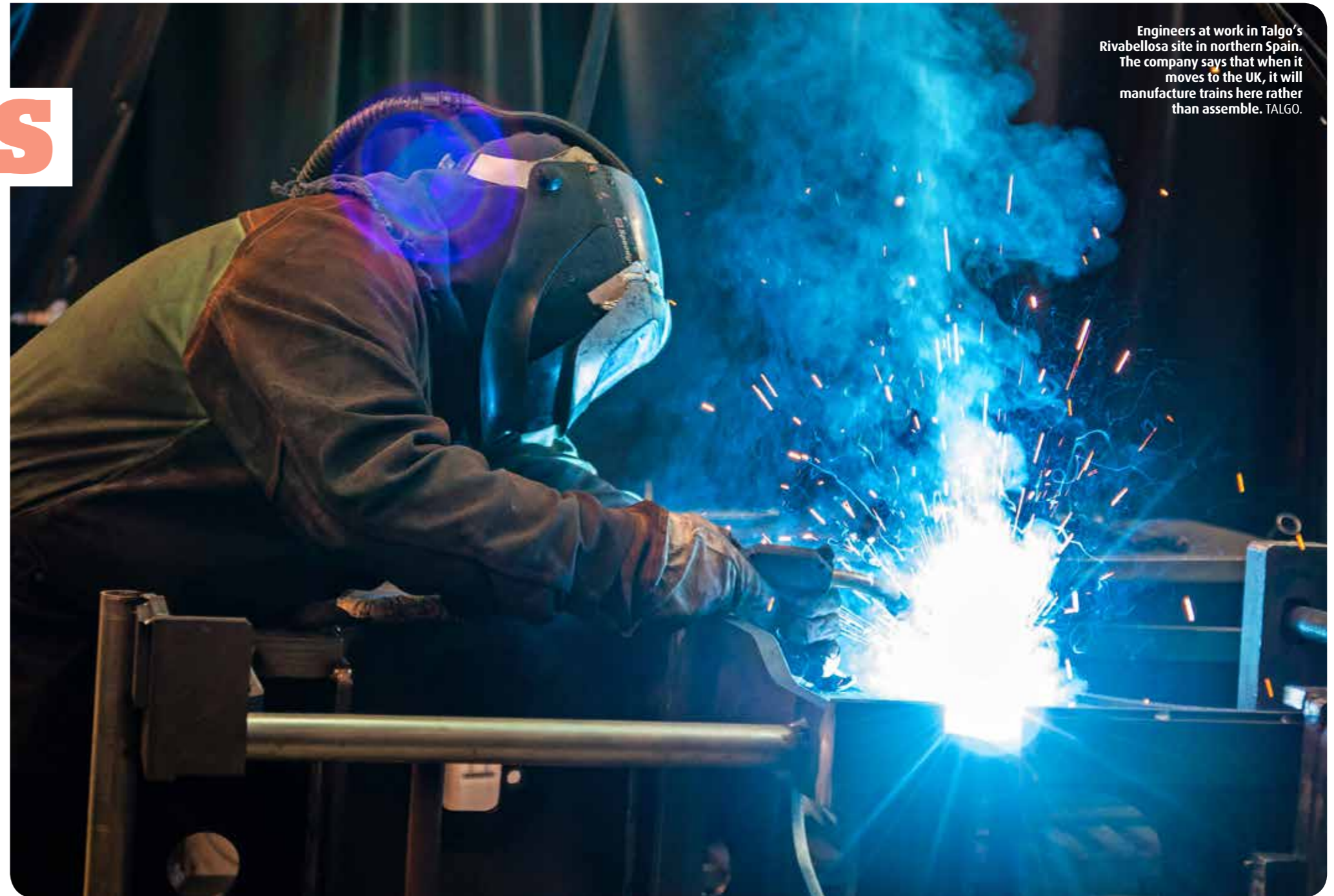
But what does Talgo actually do?

Well, it manufactures, exports and maintains trains, machine tools and maintenance equipment.

And it doesn't just support its own trains - it can support trains made by any other manufacturer, which it does in Germany and elsewhere. Talgo has also made no secret that it



Inside a Talgo coach body during construction at Rivabellosa. The site in northern Spain is similar to how the company's Longannet factory will operate. TALGO.



Engineers at work in Talgo's Rivabellosa site in northern Spain. The company says that when it moves to the UK, it will manufacture trains here rather than assemble. TALGO.

would be interested in similar work in the UK.

Talgo is actually an acronym for Tren Articulado Ligero Goicoechea Oriol (Goicoechea-Oriol light articulated train). Alejandro Goicoechea and José Luis Oriol were the founders of the company, and even today family members retain a controlling interest in the business, despite its worldwide expansion.

But why does it want to come to the UK? Announcing its Longannet factory plans last November, the company said in a statement that: "the emerging UK market has requirements that Talgo can satisfy at the technical, economic, operator, and 'passenger needs' levels. At the same time, Talgo can provide better value to the UK taxpayer."

It admits it has taken a long time to come to the UK, but said last November: "as the

UK market has matured, it has become better aligned with Talgo's high-reliability/cost-efficient approach. The implicit requirement for greater UK content also suits Talgo's manufacturing philosophy."

It cites the Department for Transport's Rolling Stock Strategy and the need for thousands of extra vehicles for its arrival in the UK, and its commitment to expanding the UK's manufacturing base.

Despite being a Spanish firm, Talgo is 35%

owned by a UK-listed private equity fund that works on behalf of UK pension funds. However, the largest percentage (53%) is owned by private investors, including employees of the company and members of the founding family.

It's well known that HS2 features in Talgo's plans. However, that is not the key reason for locating to the UK. As well as being a shortlisted bidder for that contract, Talgo has also been active in other franchise

competitions, including East Midlands and the West Coast Partnership. The company says it can provide solutions for most of the UK's rail needs and has been discussing various possibilities with financiers, operators and regulatory bodies.

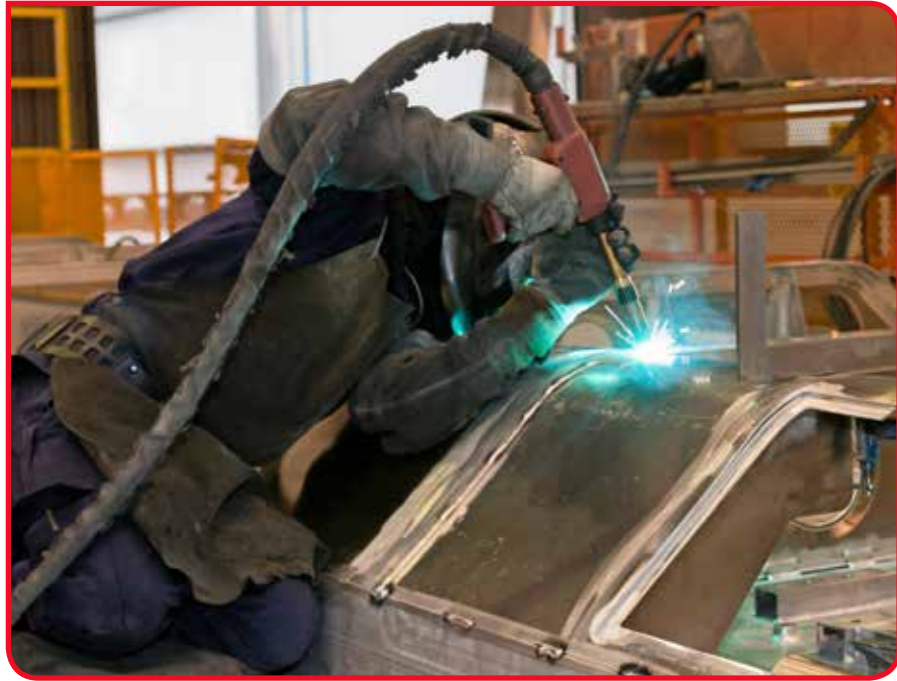
When Longannet opens, Talgo aims to employ some 1,000 staff, adding 50% to its current worldwide team of 2,000. The Scottish site would be its third factory, following Las Matas, near Madrid, and Rivabellosa (Alava), both in Spain. The former is the company's headquarters and where high-speed trains and maintenance equipment is manufactured, while the latter is where tilting passenger coaches are manufactured.

It also manages a factory in Astana (Kazakhstan) that assembles components for tilting vehicles that have been built in →



“We want to help to expand capacity and capability, to grow the potential of UK manufacturing.”

Jon Veitch, UK Director, Talgo



Construction of a roof panel at Rivabellosa. This will be for an Avril ES high speed train. Further significant contract wins could result in Longannet playing a pivotal role in Talgo's future. TALGO.

→ Rivabellosa and then supplied to the local operator.

The company also undertakes the majority of its maintenance activity at other plants - owned by each client - which are usually located in the country where the trains operate.

But why Longannet? At the time of the announcement, the company said it was in a region that: "has all of the ingredients; connectivity, space to develop, a skilled local workforce, access to colleges and universities, and great relationships with other industry and the supply chain. It is a 'brown field' site, with the potential to recycle some of the existing facilities. The area is home to many high-tech industries and its engineering excellence is currently delivering the Royal Navy's most advanced ships."

Ports were a key part of the thinking behind Longannet as these are immediately available and will be vital in the plans to export trains overseas. It's also possible that materials required during building could be delivered by sea, allowing the company to further reduce its carbon footprint. The former power station site also has its own jetty.

Potential markets for export currently being assessed include Ireland, the Americas (North Central and South), Africa and Oceania.

The plan is for the site to be independent of Spain, although it will take best practice from both Las Matas and Rivabellosa.

Talgo UK Director Jon Veitch signed a Framework Deal with Transport Scotland and the Scottish Government on July 29 that means Longannet must be 'shovel ready' when the site changes hands. He explains that Scottish Power, which used to operate the now-mothballed site, has an obligation to prepare the land for construction work. A planning application for the factory was submitted on August 14, and it is expected

that this process will run smoothly.

The plans discussed with Transport Scotland don't just concern the factory but the reinstatement of the passenger line, which would connect with an electrified passenger railway some 12 miles away. This would enable new stations at Kincardine and Longannet, and a direct train to Stirling and Alloa. Veitch said that the expectation was for the line to be ready before the first trains leave the factory.

He added that while framework agreements have been signed for various train deals, nothing had yet been confirmed for Longannet. However, Veitch remains confident that things will change in the near future.

He explains that the Scottish Government is attracted to the plans as it offers inward investment in Scotland and that during discussions money has not been mentioned. "Grants are not in our interest, and Brexit doesn't affect anything," he says, before adding: "We are working on being contract-ready. We need to be in a position whereby when a contract is awarded, construction of the site can start the next day." Veitch says that with regards to train manufacture he very much hopes that it will begin before 2023. It is anticipated that construction of the factory would take around



Talgo plays a key part in the Spanish high-speed network, with more than 50% of the country's HS operations using Talgo trains. On April 1, a Talgo S112 stands at Valencia, having arrived from Madrid Atocha. RICHARD CLINNICK.



Construction of an AVRIL ES power head at Las Matas on April 1. These trains were in development for more than a decade, and the first sets enter traffic next year. RICHARD CLINNICK.



“From the semi-skilled to the finest technical minds, there will be opportunities at Talgo UK.”

Jon Veitch, UK Director, Talgo

18 months.

Key to the plans is manufacturing in the UK. At every point the company has been keen to stress that "we also want to help to expand capacity and capability, to grow the potential of UK manufacturing. The Innovation Centre is expected to play a major role in this". (See pages 50-51).

This means that rather than assemble trains from a kit of parts made elsewhere, where possible the company will use locally sourced content with an in-country supply chain. This is designed to not only protect and support jobs and skills within the UK but also to provide new opportunities for younger generations.

Talgo emphasises that pre-series vehicles could be built in Spain. The rest would be UK 'domestic build', keeping more money in the UK economy and supporting the supply chain.

As for who the company wants to employ, it says: "From the semi-skilled to the finest technical minds, there will be opportunities at Talgo UK. Talgo's philosophy is to encourage participation and improvement by employees at all levels."

Initially, the Innovation Centre near Chesterfield will be the focus for this, and that will eventually work alongside Longannet to deliver the staff and opportunities. Currently, the company has one full-time employee, but this is likely to change very rapidly.

In Spain, the company's staff is incredibly loyal, citing excellent pay, conditions and opportunities. Visiting UK Trade Unionists have expressed approval of the culture.

Talgo's plans are not affected by the UK's decision to leave the European Union on October 31. While there are plans for up to ten free ports around the country, the Spanish firm is adamant that it was always coming to these shores, and that with interest from non-EU countries as well as its UK supply chain plans it will be able to deliver a product without being duly concerned by any financial impact Brexit may have.

There has also been a positive impact in terms of recruitment, with plans in place to visit schools, colleges and universities to extol the virtues of the company and display its innovation. It is working with the National College of Rail with the aim of displaying one of its vehicles complete with its unique 'Rodal' technology that offers lighter, lower energy trains that also cause less wear and tear to the tracks.

It was back in 1988, some 31 years ago, that the Spanish government decided to investigate high speed and to work with Talgo - neither has looked back.

Now that opportunity for innovation is available to the UK. The company is keen to invest not only in infrastructure, but in people and education, to create a legacy that everyone can be proud of.

Talgo is about much more than merely bidding for HS2. Back in the 1930s, its founders did not take no for answer when looking to offer innovative technical solutions. Eighty years later, could history be about to repeat itself? ■

LONG-TERM AT LONGANNET



An aerial view of the Longannet Power Station site, which closed in March 2016. Passenger trains could return to the site if discussions with Network Rail and Transport Scotland prove successful. TALGO.

Talgo reveals more of its ambitions for the UK, and details of its plans for a new facility in Scotland

In September 2017, Talgo revealed exclusively to *RAIL* that it wanted to establish a manufacturing facility in the United Kingdom.

But this wouldn't be just an assembly facility, this would be full manufacturing - or, as the company defines it, 'True Manufacturing'. Other than pre-series trains, Talgo wants products at the facility to be built using materials sourced in the UK.

In an exclusive interview, company president Carlos Palacio Oriol told *RAIL*: "The establishment of a manufacturing facility in the UK is a significant part of Talgo's future strategy.

"Talgo's aim is to establish true manufacturing, as opposed to assembling trains from parts made overseas. This means that we will be using materials and expertise from across the UK. This keeps more money in the UK economy and creates more skilled long-term jobs.

"We have developed excellent relationships in all the places that we have visited. We anticipate continuing these relationships to ensure that Talgo provides great opportunities across the UK."

The company recognises that the UK market has matured, so it has become better aligned with Talgo's high-reliability/cost-efficient approach.

An exhaustive search resulted in the short-listing of six sites, which was then whittled down to two. Longannet in Fife, Scotland, was selected as the winner for the £40 million development.



Linked to our 'all Britain' strategy, we intend to create opportunity and harness skills across the UK.

Carlos Palacio Oriol, President, Talgo

Longannet was chosen because it has space to develop, access to colleges and universities, and is a 'brownfield' site.

What's more, a training research and development site is planned near Chesterfield that will serve other companies.

Announcing the deal, Palacio Oriol said: "This has been a tremendously challenging mission for Talgo, and I have personally seen excellence in all corners of the UK. It has been a difficult decision to make, as the quality has been so high in so many places.

"The establishment of a manufacturing facility at Longannet is a significant part of

TWO SPANISH SITES NEAR FULL CAPACITY

Talgo currently has two factories, both in Spain. The headquarters near Madrid (Las Matas) is used for research and development, as well as the construction of locomotives and power cars for high-speed trains and maintenance equipment.

The larger site at Rivabellosa, at the foot of the Basque region and around 90 miles from Bilbao, is used to build Very High Speed Train (VHST) coaches and other trains for around the world. This site opened in 1966. It was expanded in 2012 and again in 2014. It also carries out refurbishment work.

The two Spanish sites are nearing full capacity, according to the company, with contracts for VHSTs for Spanish and Saudi Arabian operators. They will both be used to deliver on large, new contracts for the supply of trains to Germany and Egypt.

Talgo has two factories in Spain that have so far supplied 28 countries. On October 11 2017, vehicles for Saudi Arabian Very High Speed Trains stand in the yard at Talgo's Las Matas headquarters, near Madrid. RICHARD CLINICK.



Talgo's future strategy. I want to congratulate Scottish Enterprise for bringing together a wide-ranging team of industrialists, academics, politicians, civil servants and development experts. Their efforts are a credit to Scotland.

"However, our plans do not end in Scotland. Linked to our 'all Britain' strategy, we intend to create opportunity and harness skills across the UK."

Longannet was chosen because of the proximity of rail, road and sea (both Grangemouth and Rosyth ports are nearby). The company is also attracted by the number of skilled workers available in the area.

There is a plan to create what Talgo UK Director Jon Veitch described as a 'pipeline' of engineers and innovators.

The company intends to build trains for other parts of the world - including Australia, Africa and Canada, and the new facility would measure around 70,000m² and employ up to 1,000 people.

It would be built on the site of the former power station that was decommissioned in March 2016, and would be located in the area around the coal yard and discharge loop.

Construction would start as soon as the first contract is awarded. It's expected to take around 18 months to build.

And through its competitive tendering process for a site, Talgo built productive relationships with various regions, including Wales, Merseyside and the Midlands, and it aims to develop those still further.

In addition to the factory, Talgo is developing an 'all Britain' strategy aimed at protecting and encouraging the UK supply chain, that can also provide opportunities for young people while at the same time growing the UK's industrial base. The strategy will seek to build on the significant capabilities Talgo discovered that are available in the UK during its 18-month search for a factory location. ■

NURTURING TALENT

As well as a manufacturing capability, Talgo aims to introduce a cultural ethos that will attract the best the UK has to offer

A key goal of Talgo's plans for the United Kingdom is to create more opportunity and to create a lasting capacity not just for UK rail, but UK engineering and manufacturing. By developing an 'all Britain' strategy, Talgo will seek to work with suppliers across the UK.

As well as a new factory at Longannet, the company intends to create a training research and development site at Barrow Hill, near Chesterfield.

Both will rely heavily not only on the local workforce, but also on colleges and universities across the UK. Talgo is looking to recruit young people and reskill others, providing opportunities to work across the globe using the skills learned on the job that can be transferred to many disciplines within the train construction and maintenance world.

All too often, management phrases such as 'human capital' and 'human resources' are used to describe the core strength of any business - forgetting that 'people' might be a more appropriate and human description. Talgo values its people for what they are and what they can become.

Talgo has put great emphasis on being a 'people company' since its inception in 1942 when its founders recognised that to be able to do things differently, and to truly innovate, it needed to encourage and develop talent.

The belief was that experienced staff

should always have a choice of work, but by creating permanent incentives for staff Talgo planned to ensure that they'd be able to work in an environment that values both their contributions and ideas.

But what attributes are required to be a true Talgo team member? The company believes that this is achieved through a high level of technical training, sound experience and certification, as well as outstanding innovation and creative capabilities.

Cultural diversity is also key to Talgo's success. It's often seen merely as an 'add on' in some organisations, but Talgo believes it enhances its international reputation, and that "great ideas do not only come from Spain."

It believes that by encouraging creativity through diverse input and ideas the company will be able to deliver the very best that the world can offer. And that thinking is key to the establishment of facilities here in the UK. Linking these with UK educational centres will mirror the company's activity in Madrid, where the company works with the Spanish capital's college and university on training schemes designed to develop the very best in young talent that will then work with Talgo. And the opportunities are limitless.

Talgo believes in developing talent as a persistent priority, and so it offers to cover the costs of continued training programmes for professional staff. Talgo's people also commit



Staff work on a new Talgo coach at the company's Rivabellosa factory in northern Spain. The company will pay for staff to continue their education even after they qualify in their chosen field. TALGO.

their time and energy to mutual advantage, which results in a working environment that encourages personal initiative and creativity.

But Talgo staff don't take their personal successes more seriously than that of the

company. One of the great strengths in the Las Matas and Rivabellosa factories in Spain is the pride that Talgo's people have in working for the company. There is a sense of belonging at the company, and employees enjoy working for an internationally renowned firm that seeks to offer the best it can for its people. Therefore, when there is a success, it is celebrated as a team. Without that thinking, combined with the ethos of the individual staff members, Talgo UK Director Jon Veitch says the company would not have been as successful in 28 countries.

As for the opportunities, Talgo believes in offering people 'a change of scenery' and the chance to work on big international projects via the company's global presence.

Talgo's doesn't take a 'one size fits all' approach when it comes to personal development. Instead, it strives to bring together often quite differing disciplines, to nurture innovation and fresh creative thinking.

A key example of the Talgo's plans is Elena Moral. She is Project Director at Talgo and the recent winner of the Best European Railway Engineer category at the Women in

Construction and Engineering Awards.

Her career began when she enrolled in an industrial engineering course, where she was in the minority. Such was her dedication and ability that Talgo entrusted her with the delivery of the Medina-Mecca railway contract.

While other members of the consortium working on the project did not put women in such high-profile roles, it was "business as usual" for Talgo, which insisted she led the project, something she modestly called "courageous" in an interview in the Spanish media. She is quoted as saying of Talgo: "they

“One of the great strengths in the Las Matas and Rivabellosa factories is the pride Talgo's people have in working for the company.”

CORPORATE SOCIAL RESPONSIBILITY

President Carlos de Palacio Oriol is keen to highlight Talgo's Corporate Social Responsibility (CSR) and how, in 2013, the Talgo Foundation was created.

Says Oriol: "Social Responsibility is no longer a matter of mere image, it is a key tool, not only to succeed, be more competitive or endure over time but to collaborate in the best possible way to build a better society - one that's more human, fairer and more dignified.

"Therefore, Talgo launched its foundation at the end of 2013 with the mission of becoming a national and international reference for the promotion of knowledge and research in innovation and railway technological development, as well as an instrument for safety and social integration and culture. This was done through strategic alliances, where possible, with organisations and institutions with which we felt we had something in common."

considered that professional competence was the most important thing."

She was able to break down the barriers that existed in Saudi Arabia by consistently delivering the work as planned, although she is keen to point out that while there were perhaps doubts expressed by others outside Talgo regarding her role, she did not experience any prejudice.

Moral is a leader not only in her field, but also a role model in wider society. When she was studying in the mid-1990s, few other women were on engineering courses. Fast-forward a decade and the numbers had risen. Currently, in Spain, some 23% of women are studying engineering. This goes back to the heart of Talgo's belief in people, diversity and opportunities.

Talgo is adamant that it does not view the UK as a place to create a hive of worker drones. It aims to create a balance between company goals, family and social commitments. It's taken a wide array of measures to help its people maintain a healthy balance between work, personal and family life.

Some of these are common across the world - while others are sensitive to local, cultural or geographic conditions. For example, in Spain, the 'works shutdown' is scheduled for the hottest weeks of the year.

Here in the UK, Veitch was coy when he explained detailed plans for the UK due to various live bids for contracts. However, he said: "The Innovation Centre represents a major investment, which will become part of a matrix covering the UK, as Talgo pursues its 'True Manufacturing' philosophy."

Talgo's innovative thinking doesn't only cover its trains, it extends to its staff. Recruitment in the UK will begin as soon as contracts are secured; these are jobs and opportunities that could open up the world for UK talent - whether starting a career or seeking new horizons. ■



Talgo prides itself on its innovation. Inside the Rivabellosa factory, a member of staff works on a wheelset. Talgo trains are not fitted with axles, but use natural tilt created by their Rodal system to travel around corners on high-speed lines. TALGO.



Talgo offers staff the opportunity to work on projects across the globe. At Rivabellosa on November 8 2018, a Saudi Arabian high-speed set (left) stands in the yard alongside various vehicles for Spanish operator RENFE. RICHARD CLINNICK.

INNOVATION FACTORY



An artist's impression of the redeveloped Chesterfield station and the new sight line to Chesterfield's famous 'wonky spire'. WILLIAM COX ARCHITECTS.



An artist's impression of the planned innovation centre. Work could start there as early as next year. MABER ARCHITECTS.

Talgo wants to invest in the future of UK rail technology and innovation, says Talgo UK Director JON VEITCH

There is much more to Talgo's UK ambitions than its plans to build a factory in Longannet, Scotland. That may be the headline story of the Spanish company's UK debut, but further south the company intends to open a training, research and development facility in the borough of Chesterfield.

This area of Derbyshire has long been associated with the rail industry. Barrow Hill roundhouse is there, and George Stephenson lived in the town for a decade, until his death in 1848.

The borough's rail heritage was a key factor in Talgo's decision to build its innovation centre at Barrow Hill. Plans include a training centre, as well as an R&D facility.

The latter will be used as a hub for the company's technical development operations

within the UK.

But Talgo's plans for Chesterfield will also enable the town to fulfil its own ambitions. DRIIVE (Derbyshire Rail Industry Innovation vehicle) is a unique training and innovation centre conceived through a partnership comprising Barrow Hill Engine Shed Society, Chesterfield Borough Council, Chesterfield College, the University of Derby, Newcastle University and Talgo.

Talgo UK Director Jon Veitch explains: "There is an engineering renaissance under way, and we want Talgo to be a leading partner.

"We want to see a steady supply of engineers and other skilled people enter the workforce and be the innovators of the future.

"As part of Talgo's commitment to the UK-wide supply chain, our planned second

facility – in Chesterfield – will act as the catalyst."

Talgo says that DRIIVE is not just pivotal to its own plans but to the delivery of future UK rail infrastructure projects, worth some £100 billion. Veitch says that DRIIVE will complement the national high-speed rail colleges at Birmingham and Doncaster, as well as other national centres of excellence, and provide the UK rail industry with access to cutting edge research, testing and innovation facilities.

DRIIVE would also be the base for the delivery of courses covering everything from entry-level training to postgraduate study, providing opportunities for people to gain the skills needed to access the jobs created in the rail sector.

Talgo believes that this commitment to

66 We want to see a steady supply of engineers and other skilled people enter the workforce.99

Jon Veitch, UK Director, Talgo

economy in the UK and the respective regions. Helpfully for Talgo, Chesterfield sits between the two regions.

Yet another factor for the decision is geography. Chesterfield is central to the world's largest cluster of rail supply companies as well as some of the country's very best innovation networks. The town is also located central to an established skills eco-system supported by a range of leading training and education providers, research and testing facilities, as well as national centres of excellence. Talgo has plans to work with all of these to develop the skills required not only for its own business but for the rail industry in general.

It's clear to see why Talgo plans to make Chesterfield its HQ in the UK.

Another key factor is the connectivity promised by the arrival of HS2. Chesterfield will play a vital role in the UK's largest infrastructure project. Improvements to the station there are in the planning phase, as is a line maintenance depot for Phase 2B of the HS2 route. This will further augment the town's excellent connectivity. More than 23 million people live within two hours' travel of Chesterfield, and four major airports and four seaports are within 90 minutes.



The statue at Chesterfield marking rail pioneer George Stephenson's link to the town. CHESTERFIELD BOROUGH COUNCIL.

bring the centre to Chesterfield builds on the plans submitted by the Midlands Engine and Northern Powerhouse organisations, two leading campaigns to further boost the

Birmingham (30 minutes), Leeds (38 minutes) and London (79 minutes).

"We are also confident that our communities and businesses will benefit, with 11,000 new jobs and 4,100 new homes expected on the back of £1.1bn of HS2-related investment."

Cllr Gilby added that the council's priority is to make Chesterfield a thriving borough. "To do this, we must ensure that local people benefit from the proceeds of growth. DRIIVE is another important building block in achieving this".

Building upon the existing site at Barrow Hill (which currently supports 65 rail-related jobs), DRIIVE would include commercial workspace for use by companies that supply the rail industry.

In December 2018 the borough council appointed Faber Consultants and Maber Architects to carry out a detailed feasibility study into the opportunities offered by the development of such a training and innovation centre at Barrow Hill.

This was completed in April this year and includes a demand analysis that shows compelling evidence to support DRIIVE's viability. Alongside this work, an architect-led design study will be used as the basis from which to advance plans for the centre.

Talgo believes that if everything goes to plan, then the construction of the new DRIIVE centre could start next summer.

This will enable Talgo UK to have an arrangement similar to that in Spain, where its HQ in Las Matas (near Madrid) is home to research and development, in addition to manufacturing.

As the company was keen to point out when revealing its Longannet plans in November last year, it's here to do more than just build trains. The UK industrial base, collectively, could benefit immensely from Talgo's presence. ■

A HEART OF INNOVATION

Since its inception, Talgo has been about innovation. In 1938, Spanish engineer Alejandro Goicoechea went about trying to improve a technology that had been around for more than 100 years.

His ideas came from experience and, having witnessed a mail train crash, he'd seen the injuries caused by the poor design and construction of wooden-bodied vehicles.

Initially, his ideas were not well received. He presented the idea of a very light, articulated metre-gauge trainset to the La Robla Railway in Spain, but it was rejected. Undeterred, he continued to develop his ideas and unveiled 'Speed', which illustrated how light articulated trains with low car bodies could operate at higher speeds while mitigating the high costs associated with train travel at the time.

Until Goicoechea tested his theories, it was believed that railway vehicles should have a high weight per axle for safety and to avoid derailments.

Goicoechea's design used a train with

Innovation underpins much of Talgo's culture, putting it squarely in the frame for the challenges of developing a family of trains for the UK and elsewhere

an articulated triangular structure, which abandoned the traditional rolling system and was capable of achieving speeds of up to 100kmh (62mph). Again, the inspiration for this came from experience. Goicoechea had observed a number of tricycles sweep through a park, each following in the slipstream of the tricycle in front.

In the course of his testing and experimentation, Goicoechea met Jose Luis de Oriol y Urigen. As a result of this partnership, Patentes Talgo was formed (see pages 40-43).

The new company developed a single-axle system, called Rodal, that did not use mounted wheelsets. This offered a low centre of gravity,

better stability, a lower floor that makes it easier for passengers to access the carriage and a train that's closer to the ground, meaning better aerodynamics (perfect for high-speed routes). Rodal also resulted in less lateral movement compared with a conventional axle when running through a curve.

But what else was innovative about the initial design was that its short-articulated coaches meant that vehicles were lighter. This meant lower energy consumption, allowing for a higher maximum speed. Its wider coaches offered greater passenger comfort, as well as higher capacity. Talgo also maintains that the articulation is safer in the event of a

derailment.

More innovation appeared in the 1980s when Talgo sought to tackle the geographic challenges that affected the Spanish railway network. Tight curves and steep gradients were a feature of many lines, and so the Talgo Pendular was created. This is similar to a pendulum in that the car body tilts naturally into curves, enabling the vehicle to partially compensate for the effect of centrifugal force.

The development of Talgo Pendular gave the company the chance to develop trains that could run at higher speeds, thereby reducing journey times by up to 10%.

Another key challenge that faced Spanish railways was the differing track gauges within the country.

Again, Talgo stepped up to the challenge, and the first international trains ran between Barcelona and Geneva in 1969. It developed an idea from Transfesa introduced some 18 years earlier as a way of running freight trains through the Pyrenees mountain range. Installations were built that changed the axles on wagons as they slowly moved through. This worked for the freight sector, but there were concerns over how the system would work for the passenger market. Talgo looked for a solution, and perfected a system.

With its variable track gauge system, Talgo began to supply vehicles that could allow their operators to overcome the challenge of various gauges, and so the Barcelona-Paris and Madrid-Paris overnight routes became reality, with the first train running in 1974.

The Rodal wheelset system displayed on a Very High Speed Train set bound for Saudi Arabia. RICHARD CLINNICK.



The lower height of Talgo coaches can be seen on two S112s at Valencia on April 1. RICHARD CLINNICK.

"Talgo has more than 70 years' experience in challenging the norm, and of finding innovative alternatives to the status quo."

These days, trains full of passengers can change trains on the move, and regularly do so at the interface between the high-speed network (which is standard gauge) and the Iberian gauge. This permits direct trains to serve even the remotest parts of Spain.

Although relatively unknown in the UK, Talgo has been developing Very High Speed Trains for over 30 years. The decision to enter that market followed the Spanish Government's decision to build a new high-speed line between Madrid and Seville.

Initially, the company developed a modification for its existing rolling stock. But it needed to supply traction, so ten years later it partnered with Adtranz to develop a powerhead that would enable it to tender for Renfe's train contract. Although the decision regarding the railway was made in 1988, it was not until 2002 that testing began, with the first Talgo VHST set entering service in 2003.

Talgo produced more innovative ideas during the mid-1990s, this time involving traction heads. Until this point, the company had only produced coaches, but now there was

an increasing need to supply a full trainset, as well as meet the requirement for an automatic variable gauge system. This was eventually made available to the entire European train market.

The company's newest offering, the AVRIL ES, features a lot of innovation. Its cross-section area is 25% to 30% less than other VHST designs while maintaining a greater interior width on the same gauge as other trains. It is also designed to further reduce energy consumption by 7% per kilometre and by 31% per seat-kilometre. Throughout its lifespan, this can result in cost savings of around 60% of the train itself.

While it won't have to contend with variable gauges when Talgo develops its first train for the UK market, it will need to innovate again to stand out. But Talgo has more than 70 years' experience in challenging the norm, of finding innovative alternatives to the status quo and offering operators significantly reduced costs while carrying more passengers.

Surely that is at the very heart of innovation? ■

Talgo

Naturally reliable

