MAFEX
Mafex corporate magazine
Spanish Railway Association
Issue 3. April 2015

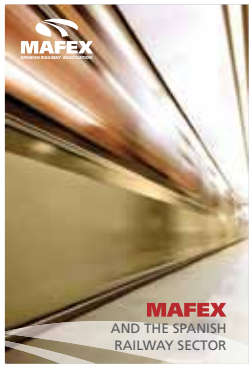
8 technological solutions
orientated to customer needs

INNOVATION AS AN IDENTITY SIGN

UITP WORLD CONGRESS AND EXHIBITION in Milan. Visit us!

IN DEPTH: METRO DE LIMA
Peru's capital city expands its metropolitan network

DESTINATION: U.K.
The country will invest more than €27,000M to upgrade and expand its railway nework



SPANISH RAILWAY SECTOR REPORT
Key features of the Spanish railway sector

Innovation as a distinguishing mark: eight technology solutions orientated to international customers

Dear friends,

The first quarter of 2015, three months full of activities, has come to an end, we are now facing with energy and enthusiasm the coming months of the year in which we will develop important actions of interest to all private companies, public organizations and railway institutions worldwide.

During the past quarter, we attended important industry international meetings such as the Railway and GCC Metro Conference and Exporail, held in Oman and Mexico respectively. Recently we also participated in the Middle East Rail Exhibition in Dubai and we organized a trade delegation to Peru and Ecuador, as well as the I Institutional Toadshow in Brussels.

In the coming months, as well as coordinating the Spanish pavilion at the exhibition Rail Solution Asia in Kuala Lumpur and UITP in Milan, Mafex will organize the V International Railway Convention, an unmissable event for all professionals in the international railway sector that will take place in Seville during the 15th – 17th of June.

But beyond all these international activities in which the Spanish railway industry is present, we want to make a special mention in this issue to the hard work that SMEs and large Spanish companies are making in technological innovation and invite all readers to know in detail eight innovative solutions that meet specific needs of various international clients.

This issue addresses one of the most iconic projects in Latin American urban transport: Metro de Lima. Also, the section In Depth includes the different investments of one of the markets with the most railway sections in the world: the United Kingdom.

In the context of this issue, we want to show our appreciation to 6 new partners for having joined our association in recent months: Azvi S.A, DSAF Dinámicas de Seguridad S.L, Faiveley Transport Iberica S.A, Hispacold S.A, Sice Tecnología y Sistemas and Tecnatom S.A.. We want to give a warm welcome to all of them and we appreciate the confidence you have placed in us.

We hope you like this issue and see you in Seville!

MANAGEMENT: MAFEX.
MAFEX STRATEGY AND COMMUNICATION COMMITTEE: Albatros, CAF Signalling, Idom, Indra Sistemas, Ingeteam, Metalocaucho, Patentes Talgo, Sener, Thales España, Vossloh, Siemens Rail Automation and Bombardier España.
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Mafex travells to Oman and Mexico

DURING THE FIRST TRIMESTER OF THE YEAR, THE SPANISH RAILWAY ASSOCIATION ATTENDED THE GCC RAILWAY CONFERENCE IN OMAN AND THE EXHIBITION EXPORAIL IN MEXICO.

GCC Rail and Metro conference (Mascate)

The Secretary General of the Gulf Cooperation Council for the Arab States of the Gulf (SG-GCC) and the Ministry of Transport and Communications of Oman organized during the 11th and 12th of January the "GCC Rail and Metro Conference", where they discussed the various railway projects that will be developed in the region in the coming years in member countries of the Gulf Co-operation Council: Kuwait, Bahrain, Saudi Arabia, UAE, Qatar and Oman.

The Conference was attended by over 500 participants from organizations in over 25 countries with interests in the region. 14 Spanish companies attended, including the Economic and Commercial Office of Spain in Muscat and the Spanish Railway Association.

Rail and metros projects in the GCC region arouse great interest in the international rail industry, particularly the 2,117 kilometres rail link that will connect 6 member states (Saudi Arabia, UAE, Bahrain, Kuwait, Qatar and Oman) with an investment of 11,300 million euros.

Exporail Congress 2015 (Cancun)

The Middle East is certainly a region with a growing presence of Spanish railway companies. From Kuwait to Oman, to Qatar Arab Emirates or Saudi Arabia, a significant number of Spanish companies actively participate in the railway development of the region, in either consulting, signalling and traffic control or supplying the rolling stock to railways of the main operators in the region: the Saudi Arabian Railways (SAR) and the Saudi Railway Organization (SRO), among others.

Also noteworthy is the presence of the Spanish railway industry in flagship projects such as the metros of Riyadh, Mecca and Doha, trams in Abu Dhabi or Lusail and the High-Speed line Mecca - Medina in Saudi Arabia.

You can find more information on the presence of Spanish companies in this region in the "In Depth" section of Issue 2 of the magazine.

Exporail Exhibition 2015

On February 9th and 10th, Mafex attended the XIV edition of Exporail, an event organized by the Mexican Railway Association (AMF) that is held in Cancun each year to gather major Mexican operators and rail infrastructure managers, as well as national and international companies from the sector.

The event, inaugurated by the General Director of Railways and Multimodal of the Secretariat of Communications and Transport, Pablo Suárez Coello, was attended by about 1000 delegates and 85 exhibitors from over 12 countries, occupying an area of over 1,500 m^2.

During the event, Mafex had the opportunity to hold meetings with different companies and managers of some of Mexico's leading rail projects, thanks to the collaboration that the Spanish Railway Association has had for years with AMF, the Mexican Association Railway.

Mexico is one of the top destinations for Spanish railway exports. The country has been in the top 5 during the last five years. Collective transport systems of Monterrey, Mexico DF and Guadalajara City have Spanish technology. Spanish companies have also worked in different Mexican railway lines such as the railway connection Mexico - Puebla, the line Mexico - Toluca, the suburban railway Cuautitlán - Buenavista - Mexico, among others.

Six new companies join Mafex

THE COMPANIES AZVI S.A., DINÁMICAS DE SEGURIDAD S.L., FAIVELEY TRANSPORT IBERICA, S.A, HISPACOLD S.A., SICE TECNOLOGÍA Y SISTEMAS, AND TECNACOM JOIN MAFEX SEEKING INTERNATIONAL SUPPORT TO STRENGTHEN OBJECTIVES

Spanish companies AZVI S.A., Dinámicas de Seguridad S.L (DSAF), Faiveley Transport Iberica S.A., Hispacold S.A., SICE and Tecnatom S.A. have recently joined Mafex, the Spanish Railway Association.

AZVI S.A specializes in construction and railway maintenance since 1901 and is internationally active since 2002 in countries like Portugal, Chile, Mexico, Brazil and Romania.

DSAF is dedicated to the design, consulting, installation and distribution of safety signs for the evacuation of people from tunnels, rails and roads.

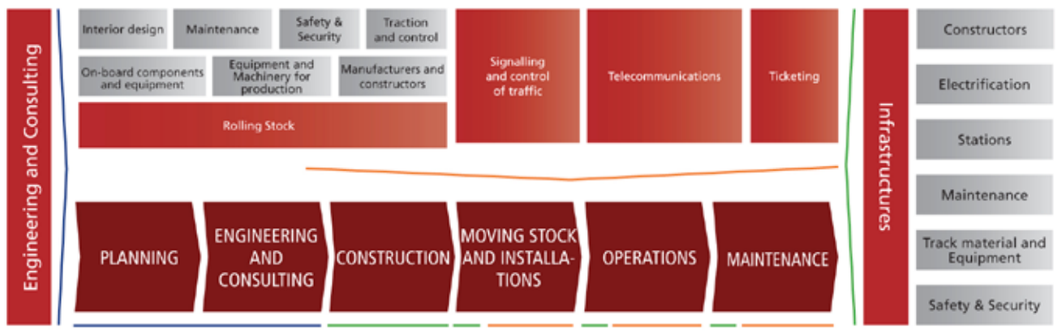
FAIVELEY TRANSPORT IBERICA S.A. is engaged to the design, manufacture, marketing and after sales service of auxiliary equipment for rail vehicles: trains, subways, trams and locomotives.

HISPACOLD S.A. is a company that designs, manufactures and supplies equipment and components for HVAC railway vehicles and trams, metros, EMUs, DMUs and LRV, among others.

SICE TECNOLOGÍA Y SISTEMAS is a systems integrator in projects related with transport, traffic, ITS, tolls and tunnels present in 49 countries on 5 continents.

TECNATOM S.A. is dedicated to the development of Non Destructive Testing (NDT) techniques and systems oriented to quality control of critical components in different sectors including rail. They have affiliates in countries like France, Brazil, China and the US.

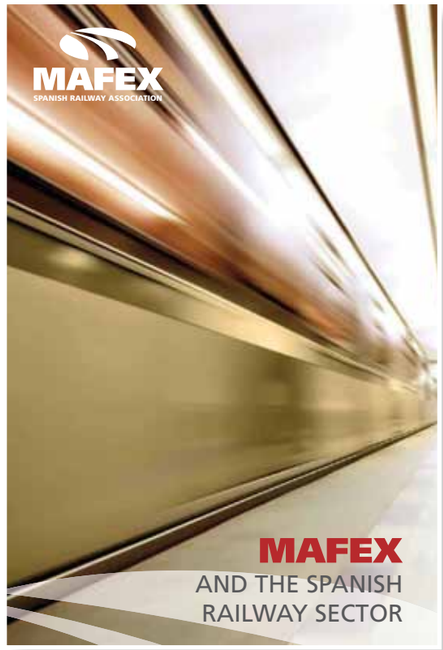
Mafex currently has a total of 74 member companies that collect around 85% of total exports of the Spanish railway sector. Among Mafex partners there are both large companies and SMEs covering the entire value chain of the rail industry.
You can access the datasheets from Mafex partners on the website of the association www.mafex.es



Value chain of the railway sector in Spain

Mafex and the Spanish railway sector

MAFEX PRESENTS A REPORT PROVIDING A CLEAR VISION OF THE RAILWAY SECTOR AND THE ROLE OF THE SPANISH INDUSTRY IN THE CURRENT NATIONAL AND INTERNATIONAL CONTEXT.



"Mafex and the Spanish Railway sector" report.

Mafex's Committee for Strategy and Communication developed over the past year 2014 the document "Mafex and the Spanish Railway Sector". This report aims to provide an overview of the context in which companies associated to Mafex develop their businesses and publicize the capabilities of the Spanish railway industry and its international presence.

The Spanish railway industry has accompanied the development and modernization of the sector from its beginnings. In some cases companies with more than a century of activity, develop and evolve their capabilities and solutions according to the requirements and needs of operators, infrastructure managers, metros, trams, etc.

Thanks in large part to its industry, Spain is currently leading the High Speed rank, first in Europe and third worldwide, and is a reference in specific technologies for urban transport systems. The Spanish technology is present in a quarter of the metros in Europe and 35% of the metros in the main cities of Latin America. Likewise, Spain is the European country with the highest degree of implementation of the European signalling system ERTMS Level 2.

Internationally, Spanish companies are present in over 80 countries worldwide and have over 225 offices and production plants.

All of this and more is covered in the document "Mafex and the Spanish Railway sector", which is available in the association's website: www.mafex.es.

BRIEFS

Middle East Rail Exhibition (Dubai)

Mafex organized the Spanish participation in this exhibition held in Dubai between the 17th and 18th of March. The Spanish pavilion was formed by six companies: Arcelormittal, CAF, GMW, LKS Sener, Teltronic, Typsa.

Commercial Delegation to Peru and Ecuador

During March 23-27, a delegation of businessmen from the Spanish railways coordinated by Mafex, visited the most important railway agencies of Ecuador and Peru.

Rail Solution Asia Exhibition (Kuala Lumpur)

For the third consecutive year, Mafex coordinates the group participation of several Spanish companies, including CAF, Indra, Talgo and OHL, in the most important railway exhibition in Southeast Asia during the 22nd, 23rd and 24th of April.

V International Railway Convention (Seville)

Seville will host during the 15th and 17th of June the V edition of the International Railway Convention, organized by Mafex and whichwill gather over 50 railway public and private companies from around the world and the main Spanish railway companies. You can find more information on the section "Mafex reports" from January's issue of this magazine.

General Assembly (Madrid)

On June 25th, Mafex will celebrate its XIII General Assembly, where it will presents the overview of the activities realized in 2014, as well as its accounts, to its associates. Also, the definition of the activities facing 2016 will also be defined in the General Assembly.

If you are interested in finding out more details of these activities, please contact

A delegation of Spanish railway companies travels to Brussels

MAFEX ORGANIZED IN COLLABORATION WITH UNIFE- THE ASSOCIATION OF THE EUROPEAN RAIL INDUSTRY -, THE I ROADSHOW FOR SPANISH RAILWAY COMPANIES IN BRUSSELS

Meeting of the Spanish delegation with UNIFE

A delegation of ten Spanish companies visited Brussels on February 23rd and 24th, under the Institutional I Roadshow organized by Mafex with the collaboration of UNIFE, the Association of the European Rail Industry.

The purpose of this trip was to introduce participating companies to those community institutions with decision-making in programs, projects and policies affecting the railway sector.

The Spanish delegation held meetings with experts from various Directorates General of the European Commission, such as the Directorate General for Mobility and Transport (DG MOVE) where the European Transport Network (TEN-T), the Connecting Europe Facility (CEF) and the Juncker Plan were presented, and the Directorate General for Development and Cooperation (EuropeAid), where details of the Funds for Transportation in the Euromed countries were presented.

Also, several meetings were held with the European Federation of National Engineering Associations (EFCA), the MEP Ms. Izaskun Bilbao, a member of the Transportation Committee of the European Parliament since 2009, and Ms. Paloma Iribas, Minister of Transport in the Permanent Representation of Spain to the European Union.

A Spanish pavilion at the UITP Exhibition

CAF's stand at the UITP Exhibition 2013 held in Geneva

MAFEX IS COORDINATING THE PARTICIPATION OF A SPANISH GROUP OF COMPANIES SPECIALIZED IN TECHNOLOGY FOR URBAN TRANSPORT SYSTEMS IN THE UITP EXHIBITION THAT WILL BE HELD IN MILAN

The most important international exhibition of public transport and urban mobility organized by the International Association of Public Transport, UITP, in Milan from June 8-10, has a Spanish pavilion coordinated by the Spanish Railway Association, Mafex, and with the participation of companies such as CAF, GOAL SYSTEMS, INGETEAM and SICE, among others.

Mafex is organizing for the sixth consecutive year the Spanish group participation. Previously, the UITP Exhibition was celebrated in Vienna (Austria), Dubai (UAE) and Geneva (Switzerland). The last one, held in May 2013, involved 326 exhibitors from 78 countries, occupying an area of 30,000 square metres and had over 25,000 visitors.

According to studies published by UNIFE, the international rail market will grow by 2.7% annually in the period over the next six years, reaching in 2019 an estimated business volume of € 176,000 M. New developments in Latin America and Asia are mainly those who continue to stimulate this demand.

Spain, leader in urban mobility

Spanish companies are specialized in targeting the principal urban transportation systems such as subways and trams technologies. For example, 35% of the metros of the main cities of Latin America have Spanish technology, such as Santiago de Chile, Lima, Mexico City, Monterrey, Panama, Medellin, Bogota and Sao Paulo.

Also, Spanish companies have manufactured the first trams without catenary for several Brazilian cities, and the propulsion systems of the novel monorails in Sao Paulo's metro are also supplied by Spain.

In Europe, a quarter of the metros have had the participation of both large companies and Spanish SMEs. Thus, some of the most demanding markets worldwide including Germany, Austria, Scandinavia and the UK, have Spanish trams.

Spanish companies are also a pioneer in the development and implementation of technological solutions aligned to reduce energy consumption, both in infrastructure of major European urban systems and rolling stock: on-board batteries, traction and energy measurement.

All this and more will be presented at the UITP exhibition in Milan during the 8th and 10th of June at the stand of the Spanish Railway Association.

CAF to supply new trams to the city of Utrecht (Netherlands)

CAF

The Dutch city has commissioned CAF to supply new trams for the new Uithof Line which links the Central Station with the Utrecht University Campus. This project is also inclusive of the infrastructure works of the 8 km light-rail line and 9 stops, in addition to the delivery by CAF of 27 trams. The estimated project cost is €440m.

The vehicles proposed for Utrecht belong to the Urbos platform, consisting of five 100% low floor modules. This is a bidirectional vehicle with 4 double doors per sidewall designed to run at a service speed of 70 km/h.

These vehicles can accommodate up to 216 passengers who will benefit from state-of-the-art video entertainment and passenger information systems (interior and exterior passenger information screens, emergency intercoms, etc.) for perfect passenger information.

Utrecht is located in the centre of the Netherlands, and with a population in excess of 330,000, is one of the main financial poles of the country. The first trams are scheduled for delivery to the Nieuwegein depot of the Dutch city in 2017, and passenger service is due to start mid-2018.

This project adds to the latest projects secured by CAF in the last quarter of 2014, namely, 118 Civity trains for NS in the Netherlands, the Mexico-Toluca inter-urban train, the Bucharest Metro extension, and the supply of trams for Saint Etienne, which have totalled contracts worth circa €1bn for the Company.

The Division of Signalling Bombardier celebrates its centenary

Bombardier Spain

2015 will be a milestone year for Bombardier, who's Signalling Division (RCS) is celebrating its 100th Anniversary year, which marks a century of leadership in rail safety and control. This centenary year reflects the date of the inauguration of the Ericsson Railway Technical Department in Sweden, on March 31, 1915, to support the local requirements of the Swedish network for railway safety equipment including electrical interlocking. The department was an important forerunner of the business we have today in Sweden and, as part of the pioneering Swedish Rail industry, was at the very core of the development of the rail signalling industry, which now spans the globe.

100
1915-2015
Rail Control Solutions

Throughout 2015, Bombardier will celebrate various activities and campaigns to mark this occasion with its customers.

Cetest completes the tests for the homologation of Amtrak's vehicles

Cetest

The testing laboratory Cetest has successfully completed the stationary tests to extend to 125 mph the homologation of Sleeper Viewliner I vehicles for Amtrak, the passenger intercity rollingstock network of the United States. Parts of the tests have been performed in Amtrak's facilities in Wilmington (Delaware), with specific portable test rigs designed by Cetest During these tests, the wheel unloading is measured, a key parameter in the safety against derailment, as well as the rolling coefficient, which is used for the gauge calculations. In this first phase, Cetest has also carried out vehicle modal analysis tests. Next June, Cetestwill complete the test campaign with on track tests for the evaluation of the dynamic behavior, which will enable them to obtain the authorization to increase the circulation speed from 110 to 125mph, in conformity with the requirements established by America authority FRA (Federal Regulation Authority). Thanks to this new project, Cetestreinforces its presence in the US, as well as the technical recognition of the most important players in this country.

ANESRIF puts its trust again in Getinsa for the modernization of its railway network

Getinsa

In January 2015 Getinsa has been awarded 5 important railway contracts in Algeria. 4 out of them are related to electrification feasibility and design studies adding up to 1042 km. The remaining contract is on signalling and telecommunication feasibility and design studies for a total length of 92 km.

Current contracts are part of the ambitious extension and modernization plan that is set up to connect main cities with high speed lines and enlarge the railway network up to 12.000 km in 2017. Today the Algerian railway network is made up of 4200 km, most part of it not electrified.

Getinsa has been participating in the development of the Algerian railway network since 2006. In fact a total of 1642 km of electrification studies with the same scope as current ones were allocated to Getinsa last year as well. The new electrification contracts in addition to those awarded in 2014 totalize 2684 km what makes Getinsa in charge of the electrification studies of the majority of the existing non-electrified lines of the country.

Ineco to supervise ERTMS deployment in Europe

Ineco

The European Commission has entrusted Ineco with the coordination and supervision of the deployment of the European Rail Traffic Management System (ERTMS) of the nine rail corridors that run across the States of the Union over the next six years.

The contract, signed last December, includes the administration and management of the work programs for the nine corridors, the coordination among the different entities involved -infrastructure administrators, operators, national security authorities, interest groups of the corridors, European associations…- the deployment management, and the technical and economic control, as well as other activities such as the communications and information support.

Pioneers in ERTMS implementation, Ineco consolidates with this program its bet on innovation, research and the development of the safest, most efficient and modern transport systems.

New Metro in Shanghai, designed by LKS Diaradesignn

LKS Diaradesign

The first of the 35 units of the new Shanghai Metro designed by LKS Diaradesign, covering lines 3 and 4, is in testing period. The result of the collaboration with the manufacturer CNR is this new model characterized by a dominant formal line of the exterior design, which runs smoothly across the front, wrapping it as the Yangtze River does when passing through Shanghai. The river symbolizes the duality of tradition and modernity converging through centuries as a channel of communication with its projection of modernity and progress, reflected by the futuristic architecture of the city. Regarding sustainability, this new model is 20 per cent lighter than the current, significantly improving its energy efficiency.

LKS Diaradesign adds this reality to a constantly growing catalog of relevant references, with a consolidated position as an internationally renowned team in the field of Transport Design.

Idom designs the first metro in Bogota

Idom

At present, the main mode of public transport for Bogota(8 million inhabitants) is BRT system, which has now reached saturation level.

Therefore the recent decision, following several years of waiting until the commencement of the design of the first metro line has been a cause for celebration in the entire city.

Idom has been chosen to design first line of 26.4 km, running between the Portal de Las Américas (a mass transit system terminus station) and Calle 127, with 28 stations and an investment of 2,500 million euros.

Demand is estimated at 800,000 passengers per day, peak time of 33,600 pax per hour in each direction. A fleet of of 40 trains with 7 carriages per train and frequency of 3 minutes. The scope of the Idom´s project includes geometric design, tunnel, workshops and depots, stations, urban planning, systems and rolling stock. Actually an extension of scope will include more alternatives and length of the line 1.

To ensure the highest level of service to the client, Idom has developed the project in its office in Bogota, with the full support of the office in Medellin, which will serve to further establish our firm in the country.

Ibertest & Voestalpine, together ensuring quality

Ibertest

SAE Ibertest has been chosen by Voestalpine AG to supply a Static and Dynamic Rails testing system installation.

Voestalpine is one of the leading and pioneering corporations in the steel industry throughout the world. With their high quality products, the Group is one of the main partners of the automotive, rail and consumer goods industries in Europe and the oil and gas industry worldwide.

The installation of the static and dynamic testing system, provided by Ibertest , has a capacity of 1000 kN and has been installed at a major plant, located in Austria.

It's being integrated in the conventional production plant for high-speed rails, which uses the welding technique: "Flash Butt Welding" where Voestalpine is one of the leading experts.

The research and development of new techniques is the foundations of Voestalpine, which has more than 1000 patents, including innovative forms of "Flash Butt Welding".

These new techniques improve the mechanical properties of welded joints and can adapt to different environments and stresses.

This increases the durability, thereby increasing the safety and minimizing maintenance costs.

The installation of the testing facility was successfully concluded by Ibertest technicians earlier this year.

Now, with this modern testing system, Voestalpine will be able to use it for both ensuring the quality of their welded rail products and for the Research and Development of new techniques to optimize their processes and products in the railway sector.

SAE Ibertest has been chosen by Voestalpine AG to supply a Static and Dynamic Rails testing system installation.

Thales and Siemens to implement their technology to install a second line on the high-speed track between Río Duero and Valladolid

Thales Spain and Siemens Rail Automation

The Board of Directors of Adif Alta Velocidad has awarded the contract to adapt the signaling installations, and train protection, telecommunications and centralized traffic control systems related to the doubling of the Río Duero-Valladolid Campo Grande track section to the joint venture set up by Thales España and Siemens Rail Automation. The contract, worth a total of €17.8 million (including VAT), also includes the maintenance of the systems for three years.

Siemens will be in charge of the work required to modify and extend the Valladolid high-speed interlock, as well as high-speed and conventional centralized traffic control (CTC), while Thales will be dealing with the work to extend and adapt the levels 1 and 2 of the ERTMS system in this track section, supplying and installing fallen obstacle detection (DCO) systems, modifying the static speed profile (SSP) on the line and the work to modernize the interlock at the conventional Valladolid station to adapt it to the new track layout.

The project also includes the transitions between levels 1 and 2 on the section with the new Valladolid-León-Venta de Baños Burgos high-speed line recently awarded.

The track section to be doubled is 11.5 km long and runs from the existing Rio Duero passing loop to the Valladolid Campo Grande station.

This doubling of the track and the incorporation of a new high-speed reserve siding, taken from the conventional system, will make it possible to increase the capacity of the high-speed line and to adapt it to the requirements of the new connections with Burgos and Leon.

Thales España and Siemens Rail Automation have extensive national and international experience in railway safety systems for high-speed, conventional and metropolitan lines. The companies have worked together before on other high-speed lines in Spain.

Vossloh España sells twelve EURO 4000 locomotives to operate in France

Vossloh Spain

Several railway operators have ordered 12 units of the EURO 4000 locomotives from Vossloh España to cover new freight services in Europe.

In particular, the French freight rail company VFLI, a subsidiary of SNCF Group in the SNCF Logistics branch, will operate 8 new units. Two of them will be ordered directly at Vossloh España and six locomotives will be provided by Beacon Rail Leasing, the pan-European leasing company. Also the French operator Europorte will put 4 more locomotives into operation. The total fleet in France will rise to 40 locomotives.

The EURO 4000, entirely designed and manufactured by Vossloh España in Albuixech (Valencia), has been favored again since its power and versatility. At the same time, the innovative solution also stands out due to its performance, reliability, energy efficiency and environmental compliance. Equipped with an EMD engine, the locomotive can handle longer and heavier freight and passenger trains at a faster speed than its competitors. These characteristics substantially increase rail operator's efficiency and allow clients of Vossloh to be more competitive in their operation.

This recent order reflects the strong confidence rail operators have in the high-performance locomotives and in the facilities of Vossloh España in Albuixech. To date about 130 units have been sold of this model and they are operating in European countries as well as in Israel and South Africa.

Start of the REMOURBAN urban regeneration project

GMW

On 17 February Valladolid hosted the presentation of the launch of the European REMOURBAN project (REgeneration MOdel for accelerting the Smart URBAN transformation).The project, funded from the European Union's Horizon 2020 research and innovation programme, aims to develop and validate an integral and sustainable urban regeneration model, tackling the implementation within the involved cities of groundbreaking ICT, mobility and energy technologies.

The five-year REMOURBAN project has a total budget of €23.8 million, 21.5 of which will be provided by the EU.

REMOURBAN is being led by the CARTIF Research Center and is being driven by a wide-ranging international consortium of 22 partners. In Spain the City Council (Ayuntamiento) of Valladolid and the companies Acciona, Iberdrola, Xeridia, GMV and Veolia will be responsible for setting up and carrying out various activities in the city of Valladolid, designed to improve energy efficiency and smart mobility.

GMV's REMOURBAN activities center on leading the set of smart mobility measures in the city of Valladolid. GMV will be in charge of monitoring the various fleets of electrical vehicles involved in the project, including buses, taxis, delivery vehicles, hire vehicles (car-sharing), plus those for private use. GMV will also be responsible for implementing a mobility-aid App allowing users to enjoy their mobility experience within the city.

REMOURBAN is the first integral project (understanding this to be a project including several activity sectors) run on a basis of public-private collaboration within the Valladolid-Palencia Smart City initiative, which GMV joined in 2010. This initiative involves the collaboration and identification of opportunities for presenting joint projects centering on such aspects as energy efficiency, support for implementation of smart and sustainable mobility and improvement of citizen attention procedures on the strength of new technologies.

Luznor supplies torches to Luanda's railway (C.F.L.)

Luznor

Luznor has been selected by Caminho de Ferro company, in Luanda, to supply the new LED torches (the new series LR), for the route that connects Luanda - Angola's capital - and Malanje. Specifically, the model LR-3BRYV, which was especially created for railway signalling, has been the first one in being delivered. This torch features as the main light source a unique high-efficiency high-power LED that allows the choice of the programmed colours, which in this case are white, red, yellow and green.

Helsinki's subway

Helsinki's new subway is to be equipped with the new Luznor torches. The model LR-1 has been selected as cabin equipment for Helsinki's subway. This model features three light power intensity levels, three intermittency modes, and automatic switch-on in the event of mains power failure.

Indra to deploy its railroad control and signaling technology on High-Speed Rail links to Burgos And Leon

Indra

Indra is to deploy its proprietary and cutting-edge railroad control, security and signaling technology to the high-speed rail lines between Valladolid and Leon and Venta de Baños and Burgos.

The project confirms Indra's standout position in rail signaling, with the multinational responsible for deploying the Centralized Traffic Control system on the new line. This is the software that centralizes and controls all signaling systems required for the line to operate properly. The company will also supply auxiliary detection systems and security sensor concentrators, based on an innovative Indra safety platform. This is the vital processing system that guarantees the security of rolling stock and full integration with the various signaling systems.

The lines will also benefit from the latest version of Indra's ASFA system (Signal Announcement and Automatic braking), the Spanish ATP (automatic train protection) security system, thus enabling safe use of the rail infrastructure and automating the control and supervision of train traffic. The digital ASFA system developed by the company has been installed on approximately one third of all trains operating in Spain, but this the first time that Indra has implemented the ASFA system on-track. As part of the project Indra will also supply systems for telecommunications, video surveillance, access control and all general security systems.

Typsa to design new metro in Stockholm

Typsa

Typsa was commissioned in October 2014 by the Stockholm County Council to design an 11-kilometer-long underground metro line from Kungsträdgården to Nacka and Gullmarsplan in Stockholm. The contract, which is being carried out in Joint Venture with the Swedish consulting engineering company Sweco, is valued at approximately SEK 500-600 million (EUR 55-65 million).

"This is Typsa's first contract in Sweden. It represents an important milestone in the current international strategy of Typsa. Typsa is a global reference in the metropolitan railway sector and will contribute its wide international experience to this project, for the improvement of the public transport in Stockholm" says Pablo Bueno Tomas, Typsa's CEO. he assignment includes the planning and design of the new 11-kilometre-long underground rail line, which will run in a rock tunnel underneath the Saltsjön Sea from Kungsträdgården to Nacka and Gullmarsplan. The assignment also includes the design of five new stations.

Typsa provides a wide range of expertise in areas spanning architecture and underground construction to rail technology.

"From an engineering perspective, this assignment is the one any engineer will dream of. It will be the first metro to run underneath the Saltsjön Sea, with a long rock tunnel and deep underground stations, presenting both planning and engineering challenges that our company together with our Swedish partner is ready to address" says Miriam Ruiz, Deputy Executive Director for Europe, TYPSA. The new metro line is expected to open in 2025

NextSense's CALIPRI and NEM Solutions' A.U.R.A wheel join forces

Nem Solutions

NextSense and NEM Solutions have decided to join forces in order to provide the rolling stock operators & maintainers with a state of the art solution for advanced wheel life cycle management. From March 01st 2015 all CALIPRI devices will be equipped with a default version of NEM Solution's A.U.R.A wheel. It provides full management of the long-term planning of railway bogie and wheelset maintenance, reducing uncertainty and over-maintenance in the planning of maintenance activities throughout the lifetime of wheelsets and of the rolling stock fleet.

Amurrio Ferrocarril y Equipos S.A. supplies High Speed Turnouts for the Meca-Medina Line

Amurrio Ferrocaril y Equipos S.A.

Amurrio Ferrocarril y Equipos, S.A. has begun suppling High Speed AV4 model turnouts for the line that will link the cities of Meca and Medina, in Saudi Arabia.

The AV4 turnouts, made with full Spanish technology, are designed and manufactured to allow speeds up to 350 km/h. on the straight track, and 170 km/h. on the diverging track. Furthermore, the exceptional environmental and climatic conditions these materials will have to endure have been considered during the design fase.

The total order, made by the Spanish Consortium for High Speed Meca Medina, SA, consists of 55 high-speed turnouts for installation on ballast, and other turnouts for lower speed with the same features, for equipping stations, sidings, etc. The final contract amount is up from 20 million euros.

The logistics of this order is particularly complicated, given that they are pieces of up to 54 m. in length, which must be shipped from multiple ports in Spain.

Record time

In addition, provision has been made in a record time, since the order was made on 2015 January 28, and deliveries must start at the end of March this year.

Amurrio leads the Joint Venture (UTE) Fabrides Haramain, which is awarded the contract, and also consists of three other Spanish manufacturers. The design of switches and crossings was conducted jointly by the four companies, as well as the manufacturing. This same JV Fabrides Haramain is also responsible for providing on-site Technical Assistance for the installations of the turnouts.

Manusa ticket gate in 15 stations of Servicios Ferroviarios de Mallorca (SFM) railway network

Manusa

Manusa, a leading company in automatic doors and access control systems, has been entrusted with the installation of ticket gates in 15 stations along the narrow-gauge railway network that crosses Mallorca island from West to East, between the intermodal Palma station to Inca, and the forks from Inca through Sa Pobla and Manacor.

In total, 21 ticket gates of a 900 mm clearance width have been installed (special width for people with reduced mobility). All the equipment has a contactless ticketing system and an integrated QR code reader.

The installation works finished last January and all the equipment is in operation under testing phase, waiting for its imminent start up of the service.

Manusa ticket gates provide fast, smooth and silent operation, and a robust and functional design that allows them to be adaptable to all kinds of readers and access control systems. Thanks to its low maintenance and consumption they are suitable for passenger high traffic facilities.

Manusa, with over 45 years of experience, develops and manufactures all its products. Along with Spain, the company has branches in Portugal, Brazil, Singapore and India, and presence in over 70 countries worldwide.

Fernando Arboledas, CEO of Essentium, met with Randy Roach, mayor of Lake Charles, in lake Charles where he plans to undertake future projects.

Assignia

The Essentium group, represented by Fernando Arboledas traveled to Southwest Louisiana to meet with representatives of the city Lake Charles, in search of looking for opportunities and projects Essentium can undertake. The interest of the visit lies in the strong economic growth that is currently being experienced in that part of the country; Sectors such as energy, industry and housing have a prominent role in this expansion which Essentium, especially Assignia Infrastructure as a member company of the holding company, has extensive experience.

On the occasion of the visit, representatives of the Spanish group, met with Randy Roach, mayor of Lake Charles, to identify which projects can be undertaken in their city, the fifth largest in the entire state of Louisiana. During the meeting, the mayor described Arboledas areas of activity in which the Essentium Works, as well as works and projects being developed within each área, with special emphasis on the benefits of the new patented MCH - company belonging to Essentium - to build houses, and the excellent results that are giving MCH in countries where it operates. At the same time, during the meeting the representatives of Essentium highlighted the accumulated experience of the group, who´s support tasks of expertise and knowledge transfer if they are primary function is to sued. Randy Roach, said the main objective of the new projects they hope to undertake is to ensure the creation of affordable housing for the population, which would fit perfectly with the activity carried out Essentium.

The meeting was also atended by George Swift, CEO of "Alliance for Economic Development of Southwest Louisiana", who noted that up to two dozen companies were interested in finding new business opportunities in Southwest Louisiana. The meeting ended with the delivery of the keys to the city representative Essentium and statements emphasizing the desires by the group to be together with the authorities in Lake Charles to enforce the projects they want to accomplish.

The Essentium Group is an international holding company, the highlights: Assignia Infrastructure, MCH, Niplan Engenharia and Eductrade.

CAF Signalling celebrates 5 years marked by growth and technological development

CAF Signalling

IIn July this year, the company CAF Signalling celebrates its fifth anniversary since its foundation in 2010. This period has been marked by the company's growth from a technological and corporate point of view. The definition of a specific long-term strategy was essential during its beginnings. A corporate structure of railway signalling, acquired by the group that same year, was duly incorporated to CAF Group's structure, given that the company was already developing on-board ERTMS signaling equipment through its subsidiary SEINALIA.

Focusing the efforts of the company on railway signalling, CAF Signalling wagered on a strong investment in R&D&I, cost control and risk management in order to increase competitiveness, which combined with a marketing boost, provides excellent results in projects contracted.

During this time, other important objectives have been achieved, such as the development of new signalling solutions or the positioning as international leader in ERTMS systems. Likewise, the company has also got a foothold in new overseas markets such as Brazil, Bulgaria, Mexico or Taiwan, amongst others.

Currently, CAF Signalling has two corporate offices: Ordizia, administrative headquarter and place where all the activities related to on-board ERTMS signaling are coordinated; and Madrid, competence centre for infrastructure solutions. Additionally, CAF Signalling counts with a subsidiary in Turkey: CAF Sinyalizasyion.

Map of the current main railway networks in the UK

Several stations will be remodeled: left Tottenham, and above is Abbey Wood.

The interior and exterior of Bond Street will have this design in a few years.

The U. K. will invest € 27,000 M during the next five years

ON THE OCCASION OF THE 2012 OLYMPICS, THE UK BEGAN TO IMPROVE ITS RAILWAY SYSTEM, EVEN THOUGH IT IS NOW WHEN THE COUNTRY IS STRONGLY COMMITTED TO THIS TRANSPORT MEAN. ITS FOCUS HAS BEEN BASICALLY FOUR MAJOR PROJECTS: CROSSRAIL, HIGH SPEED 2, NOTHERNRAIL AND THAMESLINK. ALSO, FOR 2019 THE NUMBER OF PASSENGERS IS EXPECTED TO INCREASE 14% AND FREIGHT TRAFFIC 19%.

The railway network in Great Britain is the oldest in the world. It currently has a length of 16,534 kilometres, with a width of 1,435 mm. Northern Ireland has a 341 km network of 1,600 mm wide. After the impulse that led to the realization of the Olympics, the United Kingdom proposed to hold a strong remodelation of its railways. From 2014 to 2019, the UK will invest an annual average of 5,500 million euros, which is primarily to increase the capacity of its lines and improve the reliability thereof. Among the major projects planned are Crossrail's line metro, that will connect the capital from west to east; a second High Speed line (High Speed 2); and the projects called Thameslink and Norhernrail. With all these infraestructure, the UK will connect the big cities with a modern system that will improve the lives of the English in their ability to move.
Also, other investments are going to be realized:

- Upgrade of rail infrastructure and rolling stock. The Government has committed to invest almost 13.999 million euros in the railway network within the High Level Output Specification (HLOS). The line between Scotland and London will also be renewed.

- As for improvements in capacity, the UK has proposed an investment of 290 million euros for the line South West Trains.

- The renovation of the electrification of the Great Western line is also planned, a work that will end in 2017. Improvements will also be made in Midland Main Line and the line Bedford and Oxford.

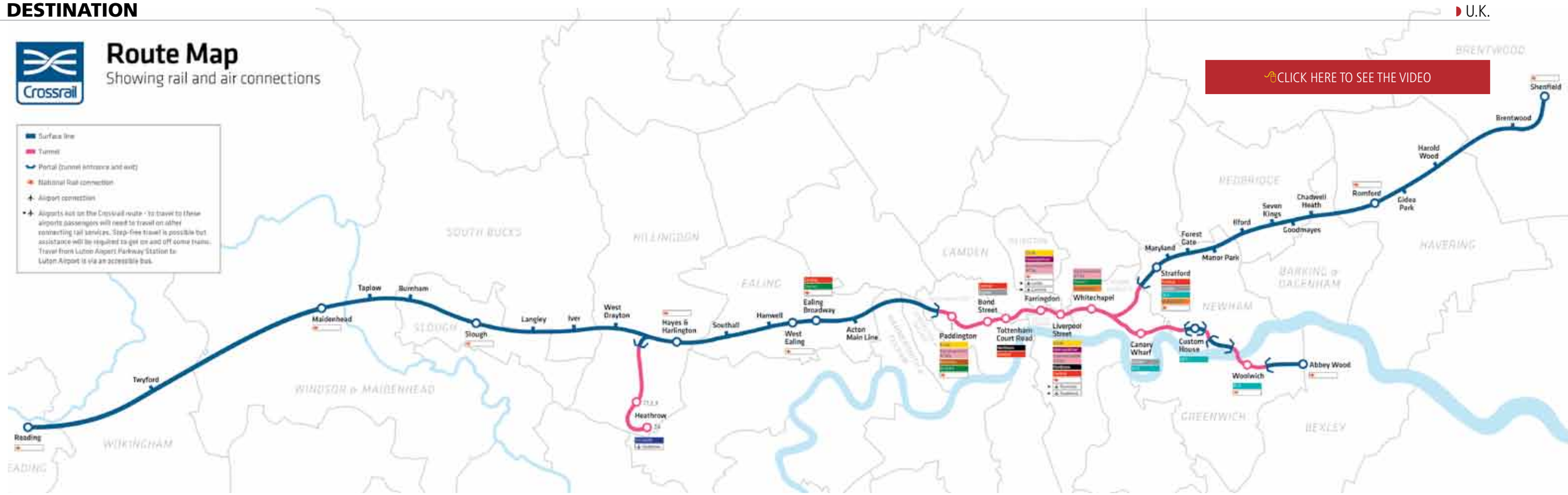
- Upgrading stations is another investment approved by the UK. Among them, Reading station, Manchester Victoria Station, Temple Bristlol Meeds. Also, two new stations for the line Leeds-Bradford will be built.

- Increased strategic rail freight capacity on the route from Felixstowe to Nuneton.

- The investment program in the subway includes improvements in the Metropolitan, Circle/Hammersmith and Distrit lines.

- And finally, the creation of a new station on the line Gogar Rail Interchange and a stop at the Edinburgh tram system aim to improve access to the airport.

Images: National Rail



A map of the line showing the areas under tunnel.

CROSSRAIL

Crossrail is one of the most important European railway projects. The city train, which will operate as a commuter, will cross London from East to West, connecting with the English town of Reading. The train will reach the county of Essex and will communicate with Heathrow Airport and Abbey Wood district in the South.

The project began in 2009 and is expected to be operational in 2019, with an investment of 20,200 million euros.

The line will have a length of 118 kilometres, mostly underground, but also 8 new stations will be built, 28 will be upgraded and 21 kilometres of underground network will be excavated.

The origin of the line is in the town of Maidenhead (78,000 inhabitants), located in West London. From there the line will run on the surface with an underground branch towards Heathrow Airport. In the vicinity of Paddington Station, the tunnel begins under central London stations on Bond Street, Tottenham Court Road, Farringdon, Liverpool Street and Whitechapel. The main section will join Paddington Station, a key point for railway connections with the West of the UK, and Whitechapel, through central London and Liverpool Street. In Whitechapel the line is divided into two branches, one that would pass through Stratford, using it as a rail tube to the east of the country and for international connections, and a second one running through Shenfield. A second smaller branch will pass through Canary Wharf across the river to Abbey Wood.

On the west side, the main section will run from Paddington to Maidenhead already halfway there will be a small branch out into Heathrow Airport.

Financing

The total allocation of available funding to carry out Crossrail is 20,200 million euros.

Over 60% of the cost of Crossrail is being funded by the Londoners and London based companies through a "Business Rate Supplement" (Supplemental Fee Business) and direct contributions from the City of London, Heathrow Airport and Canary Wharf Group. Also, there are direct contributions from the Government of the United Kingdom.

Crossrail is designed to be a service that integrates with existing networks of London and National Rail station in London. It is expected that over 200 million people travel on Crossrail each year. Crossrail will provide a radical change in the supply of public transport in the capital. Up to 24 trains per hour, with capacity for 1,500 passengers, will travel to central London during peak hours.

Project Benefits

Like any infrastructure project well planned and delivered, Crossrail will provide enormous benefits to the UK.

- Crossrail will transform rail transport in London. It will increase capacity by 10%, support regeneration and reduce travel times in the city.
- It will travel more than 100 km from Reading and Heathrow in the West, through new tunnels under central London and to Shenfield and Abbey Wood in the East.
- There will be 40 Crossrail stations, including 10 new stations at Paddington, Bond Street, Tottenham Court Road, Farringdon, Liverpool Street, Whitechapel, Canary Wharf, Custom House, Woolwich and Abbey Wood.
- Crossrail will transport 1.5 million people in less than 45 minutes to central London; will connect key business and leisure centres such as Heathrow, West End, the City, Docklands, allowing greater economic development.
- The first Crossrail services through central London will start at the end of 2018 and approximately 200 million passengers per year will use Crossrail.

Relevant aspects

The works for the construction of a "London marathon tunnelling" are nearing completion. It will consist of 26 miles (42 km) of underground tunnels in the city of London.

A total of eight TBMs are being used for the construction of new underground railway tunnels in London. The work of the tunnels has already reached 50% of completion.

Western TBMs Phyllis and Ada have already completed their contribution: the construction of 6.8 kilometres, each between Royal Oak and Farringdon.

In the east, Elizabeth and Victoria TBMs are building new tunnels between Limmo in Canning Town, and Farringdon.

In southeast London, Sophia and Mary TBMs have completed 2.9 kilometres from Plumstead to North Woolwich.

TBMs Jessica and Ellie have completed 2.7km from Pudding Mill Lane, near Stratford, to Stepney Green.

Bombardier awarded

To deliver Crossrail services, 65 new trains will be required. Each Crossrail train will be 205 meters long and capable of carrying up to 1,500 passengers. The contract awarded to Bombardier Transport, consisting of rolling and terminal stock, is the largest single Crossrail contract worth around 1,200 million euros. The contract includes the supply and delivery of new rolling stock and a terminal at Old Oak Common, as well as its maintenance during 32 years. Crossrail will introduce rolling stock on the Great Eastern Main Line starting on May 2017. The fleet will be introduced progressively in the existing rail network in time for the services started in the central section of Crossrail.

Bombardier has confirmed that the new trains will be manufactured and assembled at its plant in Derby. This contract will bring 760 jobs in the UK, and 80 positions for apprentices. It is estimated that 74 per cent of the cost of the contract will remain in the UK's economy.

The construction of the maintenance tank at Old Oak Common will generate 244 jobs, plus 16 apprenticeship vacancies. When the project is fully operational, the terminal will generate 80 jobs to give maintenance to the new fleet of trains.

CLICK HERE TO SEE THE VIDEO

Images: Crossrail

In the picture, the future station Canary Wood with a modern and innovative design adapted to accommodate a large number of passengers.

Step by step of the project

Currently, tunnels and major civil engineering works are nearing completion.

From 2015 to 2017, the equipment of stations and tunnels will continue, as well as significant improvements to the existing rail network for Crossrail services operated by Network Rail.

Within two years (2017), the first new Crossrail rolling stock will begin to replace existing suburban trains between Liverpool Street and Shenfield.

In late 2018, the first Crossrail services will begin operating in the underground section in central London.

And before 2020, Crossrail full services will be operating from Heathrow and Reading Abbey Wood and Shenfield.

Long-term plans

It is already assumed that Crossrail will not be the ultimate long-term solution to the problems of passenger transport in London, therefore a Crossrail 2 has been brought up, with a North-South design.

Correspondence with the current Crossrail construction would be in Tottenham Court Road station and would pass by the significant number of stations in the north: Euston-St Pancras and King's Cross.

CROSSRAIL IN FIGURES

- Crossrail is the largest European contruction project - works began in May 2009 and today there are over 10,000 people working in more than 40 construction sites.
- More than 60 million hours of work have been carried out so far in the Crossrail project.
- Crossrail will transform rail transport in London, will increase capacity by 10%, support regeneration and reduce travel times in the city.
- Crossrail's route will travel more than 100 km from Reading and Heathrow in the West, through new tunnels under central London and to Shenfield and Abbey Wood in the East.
- There will be 40 Crossrail stations, including 10 new stations at Paddington, Bond Street, Tottenham Court Road, Farringdon, Liverpool Street, Whitechapel, Canary Wharf, Custom House, Woolwich and Abbey Wood.
- Crossrail will transport 1.5 million people in less than 45 minutes to central London; will connect key business and leisure centres such as Heathrow, West End, the City, Docklands, allowing greater economic development.
- The first Crossrail services through central London will start at the end of 2018 and about 200 million passengers per year will use Crossrail.
- The total allocation of available funding to carry out Crossrail is 20,200 million euros.

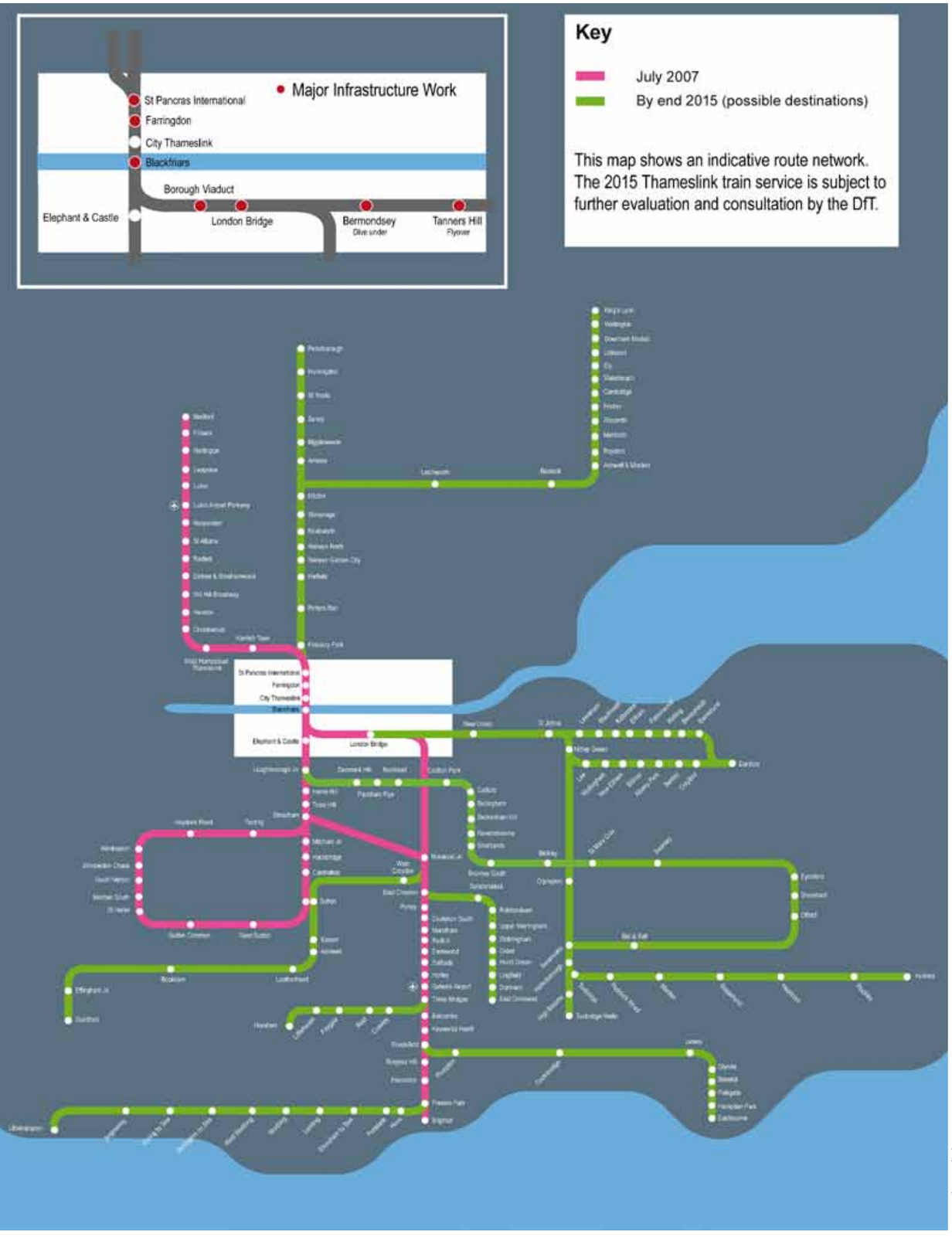


Image Thameslink

THAMESLINK

With a budget of 7,400 million euros, the Thameslink project will connect the north and south of the River Thames enabling passengers to make the journey without having to make a change train.

The program known as Thamelink will completely change travelling between the North and South through London and, In consequence, passenger demand will increase. Construction works and suitability were formally launched in 2008 and is expected to be completed in 2018.

Once the project is completed, the Thameslink network will be able to offer about 24 trains per hour (equivalent to a train every 150 seconds) through the central core between St Pancras Station and Blackfriars. Each train will have 12 cars. Thanks to this program rail congestion in the London underground will decrease, especially in the Northern Line. For the first time this rail link will allow passengers to travel from Peterborough and Cambridge directly to Blackfriars.

Thanks to interconnections with the Crossrail line, there will also be direct links to the three major airports (Gatwick, Heathrow and Luton) and St Pancras International. Also, other destinations like Dartford and Ashford, East Grinstead, Guildford, Horsham, Littlehampton and Eastbourne will also have train connections.

In order to achieve this network, two railway tunnels in North London have been linked, extending between the main line of the east coast, near King's Cross Station, and the Thameslink route, in St Pancras station.

Another important aspect that is being carried out to achieve Thameslink is signalling the central section. To achieve a capacity of 24 trains per hour, Network Rail has chosen to install ETCS level 2 overlaid with automatic operation. The launch of the new signalling is closely related to the reconstruction of infrastructure and stations in the central section of Thameslink

This program will enable to decrease congestion in the access to London Bridge station and, at the same time, waiting times for trains on platforms will be reduced.

Station design

The upgradingof the stations was based primarily on three of them:

- **Blackfriars:** The first station to cross the Thames provides longer passenger trains and more frequent services and easier access to the metro, in addition to free access to both banks of the Thames. Today, passengers are already benefiting from twice the number of new platforms and track systems and services have increased from 8 to 12 trains per hour (and up to 24 when Thameslink is completed in 2018).

The station also includes the world's largest solar bridge with more than 4,400 photovoltaic panels. The roof provides up to 50% of the energy station. Network Rail was responsible for managing the upgrading of the new Blackfriars station, whose funding was provided by the Thameslink program.

- **Farringdon:** In 2018, this station will become a railway hub between Thameslink and Crossrail and will provide direct links to the three major international airports (Gatwick, Heathrow and Luton) and St Pancras International. Works on Farringdon Station are already finished and there is a new main entrance for Thameslink and for future Crossrail passengers.

- The greatest work included in the program, which is still unfinished, is London Bridge station. At the end of the project, about 54 million passengers per year will stop at this station. The works are being carried out in two phases to avoid its closure.

Thameslink will transform London Bridge station which, along with the signalling of the central section and the new fleet, are the last two major projects that are in the program. The station will be able to move up to 86 trains per hour in each direction. The most intense phase of the project began in 2014 with the closure of some of its platforms and diversion of services to avoid the station. The main works will continue until 2017.

London Bridge station is being upgraded to support a traffic of more than 54 million passengers per year.

HIGHSPEED 2

HS2 will be a High-Speed rail network, Y-shaped, connecting London with Birmingham, Manchester via Crewe and Manchester Airport and Leeds with intermediate stations at East Midlands and South Yorkshire. The HS2 trains will join the existing network of direct services to northern England and Scotland.

The total project cost will amount about 39,000 million euros, and the first stage of could be completed in 2026.

The new rail network will generate a profit when operated of about 56,400 million euros, plus fee revenue of 40,800 million euros) over a period of 60 years.

Also, the travel time between London and Birmingham with the new line will be reduced to 49 minutes, thanks to the use of trains that will reach speeds of up to 364 kilometres per hour.

The project will be built in two phases. The first phase will connect London and Birmingham, and the second will join Birgmingham and Leeds via the new stations of East Midlands Hub in Toton, and Sheffield Meadowhall.

It is one of the projects of major transport infrastructure ever built in the UK. The project will provide vital transportation links between cities and regions across the UK. The HS2 network will reduce travel times between some of the largest cities in the UK and also create economic benefits and thousands of jobs.

The line from London to Birmingham will be about 140 miles (225 km) long and the whole Y network will be about 330 miles (531 kilometres) long. Over 50% of the route will pass through 140 miles of tunnels, while about 56.5 miles (91 km) will be partially or completely hidden to reduce noise and visual impact on the surrounding communities.

The HS2 will be operated only with High-Speed trains that reach up to 360 km/h and will be classic compatible vehicles that offer greater seating capacity to serve large volumes of passengers arriving at the same time.

Image High Speed 2

tracts to Mott Macdonald, Atkins, Capita ineco and Arup JV for designing different segments along the High-Speed line.

Capita Ineco JV will prepare preliminary designs for the route through Warwickshire and Staffordshire, and connection with the West Coast Main Line.

Thus, High Speed Two (HS2) is a scheme that will offer greatly enhanced rail capacity and will optimize connectivity between major urban areas of Great Britain, providing the basis for sustainable economic growth in a context in which High-Speed appears to be one of the transports of the future.

Ineco prepares preliminary designs

In April 2012, HS2 awarded con-

NORTHERN HUB

The Northern Hub is a program of railway improvements in northern England. Scheduled for completion in 2019, it will allow an increase of 700 trains functioning each day and a capacity of 44 million more passengers per year.

Over the next five years, the Northern Hub program will provide power grids and new sections of rail starting from Greater Manchester and moving to other areas, with the aim of regulating the circulation of important stations such as Chester, Liverpool, Bradford or Leeds, and thus decreasing congestion in Manchester Piccadilly. There will be four fast trains per hour traveling from Liverpool to Manchester and the number of running Pennines trains will increase. It is also expected that travel times between cities will decrease 25%.

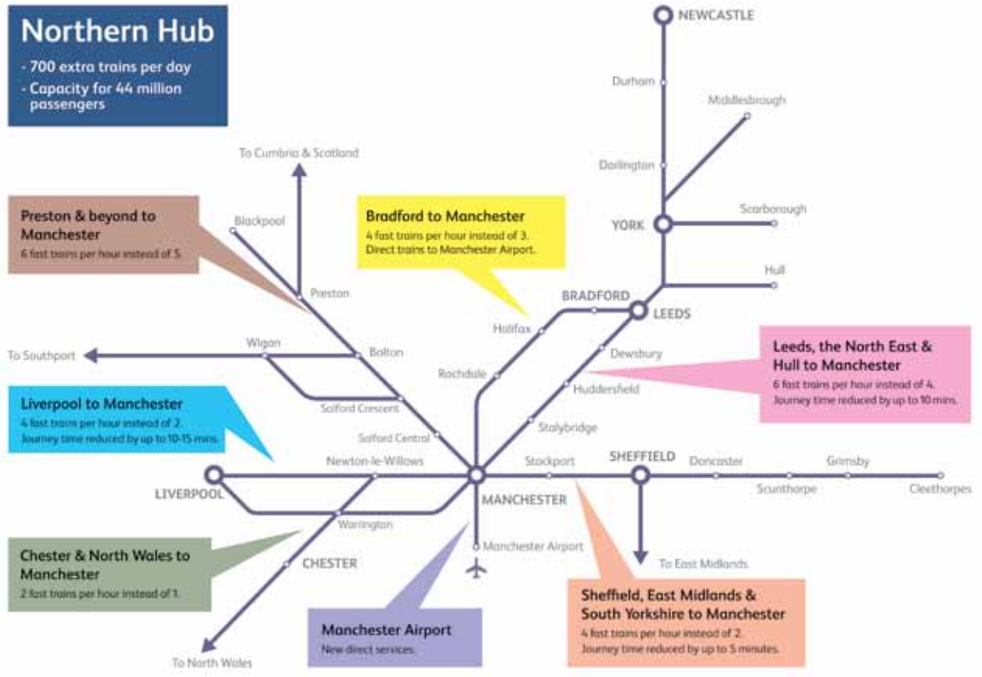
Network Rail has highlighted the great benefits of the project for the region. It estimates that, in addition to reduced journey times, economic yields of 4 billion pounds will be gained, and rail capacity will increase up to 700 more trains per day. Manchester Airport Station, the

CLICK HERE TO SEE THE VIDEO

UK's third largest, will be the first to see the results. With a total of 27 million euros invested in its reform, including the works of rail links, the Project will reach conclusion by the end of December 2016, when connected with Bradford and Halifax.

Benefits

Travel times between Manchester Victoria and Liverpool will be able to be reduced about 10 minutes. Also, there will be fast trains every hour between Leeds and Manchester (as opposed to the four existing) and travel times could be reduced about 10 minutes. There will also be a direct service from the centre of Manchester to the airport in this city. In addition, travel times will also be reduced to Sheffield East Midlands, Cherter, Bradford, Halifax, Hull, Newscastle and the North East.



Images: Northern Hub

SOME MAFEX PARTNERS

GMV

GMV has now formalized the constitution of a new UK subsidiary company to be based in the Harwell Innovation Centre in Oxfordshire in southeast England. Almost since its very foundation GMV has worked in close collaboration with British industry, especially in space projects. In 2012, as part of this development, GMV reached a strategic collaboration agreement in the transport area with the British traffic management systems leader IMTECH PEEK for joint development of advanced fleet-management and passenger-information systems and fare-collection systems. In 2013, as part of its ongoing policy of worldwide expansion, GMV set up a strategic business development plan in the United Kingdom. This involved the constitution of a new company, up and running since late 2014. As well as this latest firm, GMV also runs subsidiaries and offices in France, Colombia,

Germany, India, Malaysia, Poland, Portugal, Romania, Spain and USA. The main goal of the new Oxfordshire subsidiary is to draw up a long-term project to harness the business opportunities offered by Britain, with an important base of operations and added value. Emphasis will be placed on the space market, and specifically in the segment of applications, earth observation, telecommunications and new technologies.

IDOM

Idom is present in UK since 2001, with permanent offices in London, Cardiff (Wales) Manchester, Derbyshire, Keston and Moray (Scotland) provides engineering, architectural and environmental services. Idom team in UK is nearly 100 staff and it is fully integrated into the group IDOM(2,500 professionals).

Idom has a wide expertise in the Railway Sector worldwide and in UK has focused on railway innovation. Idom has won several competitions throughout 2014 to develop rail solutions that Network Rail can implement in their lines of operation (integration and efficient catenary system design, "needle system" (see innovation section: Mafex magazine January 2015)). In the urban rail transport IDOM UK in 2014 developed a PMR project, an innovative transport system for Luton airport. In high-speed railways Idom since 2012 is engineering firm included in framework contract for the development of feasibility studies of phase 2 of HS2 between Birmingham and Manchester and Leeds. Idom is currently in the process of prequalification and forming consortia for ECI(design & built) phase 1 of high speed line between London and Birmingham.

INECO

Ineco takes part, alongside British consultancy Capita Property and Infrastructure, in the preliminary design of the third-of-five section of United Kingdom's high speed line HS2, which will link the cities of London and Birmingham.

WITH PROJECTS IN THE UK

INDRA

London Underground entrusted Indra with the design, development and rollout of the Metronet centralized alarm management system. This system works using a homogeneous platform, which monitors and manages the alarms received from heterogeneous infrastructure control systems, as opposed to the large number of systems which previously worked in isolation and with a limited number of users.

Thanks to this project, London Underground managed to guarantee that high priority alarms are monitored 24/7 and brought down the response times for maintenance teams, managing all the alarms through a single system with a homogeneous format.

The system began by controlling the alarms to 412 water evacuation pumps in stations, and then was expanded to include other systems such as marking, ventilation of

tunnels, elevators and escalators, falling of leaves, etc. London Underground is responsible for the renovation and maintenance of two thirds of the London underground infrastructure, including trains, stations, marking, tunnels, etc.

Indra has also recently been awarded a contract with Transport for London (TfL), the agency responsible for the London transport system, which manages buses, underground and trolley cars in the capital, and also a road network of 580 km, to modernize the technology used to control and operate the 12 road tunnels in the city of London and 90 km of roads which connect with them. The contract includes the design, installation and commissioning of a new integrated management system for the London Streets Tunnels Operation Centre (LSTOC), and its maintenance.

VOSSLOH SPAIN

The first locomotives manufactured by the Valencian factory, in cooperation with EMD, for the UK market were the 30 Class 67 locomotives delivered in 1999-2000 to EWS which were the first diesel locomotives at 200km / h worldwide.

Recently, based on its EUROLight locomotive platform, Vossloh España has specially developed two locomotives for UK gauge: a powerful diesel-electric locomotive (UKLight or Class 68) and a dual-mode locomotive (UKDual or Class 88) both suitable for passenger and freight transport.To date 25 UKlight and 10 UKDual locomotives have been sold. 15 UKLight locomotives are in commercial service for a year. The Dual-mode locomotives will be delivered in 2016, with a top speed of 160km/h and a power of 4000kW in electric mode and 700kW in diesel mode, they can run on electrified as well as on non-electrified lines.

In addition, Vossloh España is manufacturing the first train-tram for UK, for the operator SYPTE. It is a pilot train-tram project that can open the door to some other train-tram projects in the country.

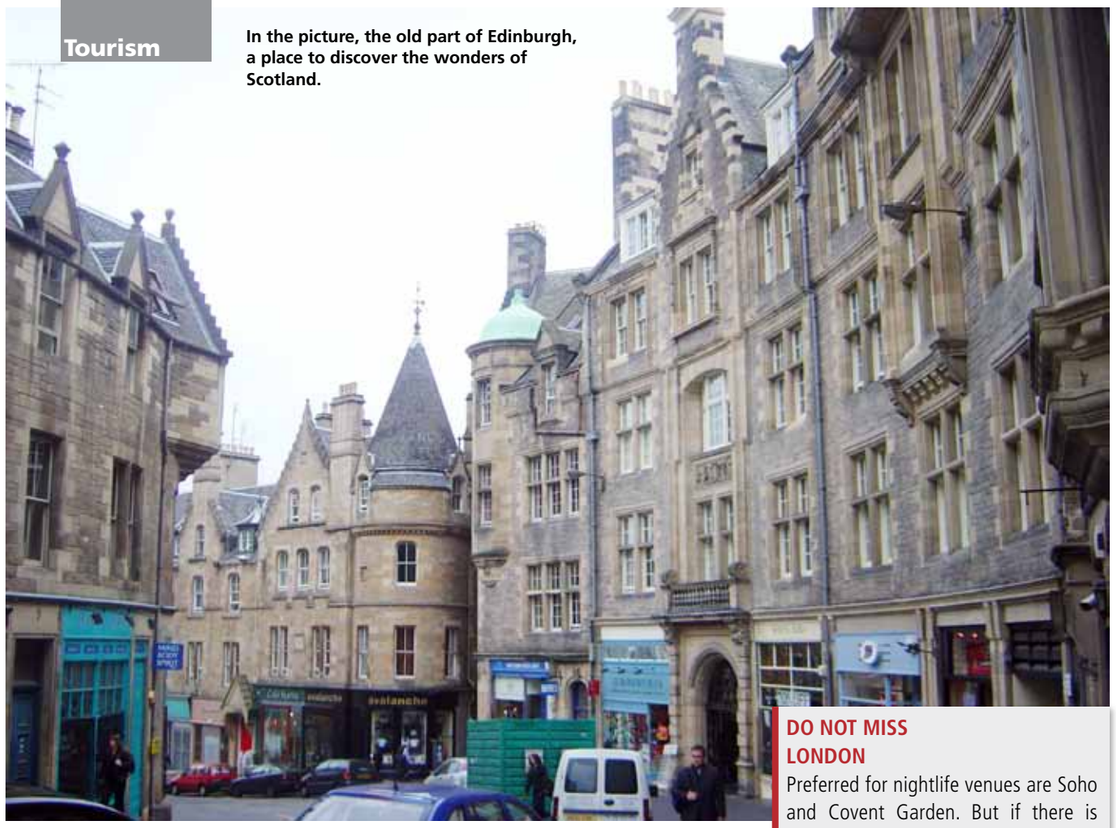
Summarizing, the projects are:

- 30 diesel-electric locomotives Class 67 (JT 42 HW HS) delivered in 1999-2000 to EWS.
- 15 diesel-electric locomotives Class 68 (UKLight) ordered in 2011 by the leasing company BRLL to be used by the DRS for passenger and freight operations. They were delivered last year and are already operational.
- 10 additional Class 68 ordered in 2014 that will be delivered late 2015 to BRLL to be also used by DRS.
- 10 locomotives Class 88 (UKDUal) ordered in 2013 by BRLL for DRS. They will be the first dual-mode locomotives in UK.
- 7 train-tram CITYLINK for SYPTE (Sheffield) ordered in 2013 will be delivered shortly.

METALOCAUCHO

The company Meatocaucho has participated in several projects in the UK.:

- Primary suspension (Chevron Spring) for Bombardier for the London Underground's Sub-Surface Lines
- Primary suspension (Guidyng Bush) for Siemens Desiro UK
- Primary and secondary suspensions for Siemens Thameslink (SF7000)
- Primary and secondary suspensions for the following CAF projects:
  - Birmingham Trams
  - Heathrow Express
  - Edinburgh Trams
  - Regional Trains Serie 3000 and 4000 for NIR
  - Regional Trains for Northern Spirit (Angel Trains)



In the picture, the old part of Edinburgh, a place to discover the wonders of Scotland.

UNITED KINGDOM, THE PERFECT PLACE TO HAVE FUN

THE UK IS A COUNTRY WITH A FULL RANGE OF LEISURE OFFERS IN WHICH THE TRAVELER WON'T HAVE TIME TO REST. WE GIVE YOU SOME TIPS TO MAKE THE MOST OF YOUR STAY IN THIS COUNTRY.

London, the capital and economic, cultural, commercial and political centre of the country, is known for its historical development, the offer of leisure activities, numerous world-class museums and its prominent position as a trading centre.

Edinburgh and its historic centre invite you to discover some of the wonders of Scotland, including Edinburgh Castle, the Saint Giles Cathedral or the National Gallery of Scotland.

Glasgow is a cosmopolitan place with on-going activity. We must highlight the cultural activities that can be enjoyed in the King's Theatre, the Theatre Royal, Citizens Theatre, the Kelvingrove Museum, the Gallery of Modern Art (GoMA) and the Burrell Collection highlights.

Manchester, the city that was the emblem of the Industrial Revolution, is known for its history embodied in modern museums and entertainment proposals.

Canterbury, a prominent religious centre, invites the faithful believers to enter the Cathedral.

The Highlands of Scotland, a mountainous and sparsely populated area, radiates with natural beauty and immerses the traveller in the most mysterious and wild part of the UK.

Nottingham, the land of well-known legends such as Robin Hood.

DO NOT MISS

LONDON

Preferred for nightlife venues are Soho and Covent Garden. But if there is something typical in the British capital, is the tea. So do not miss a visit to the Ritz to the Savoy. These are the main places to take afternoon tea.

LIVERPOOL

The epicentre of nightlife is the passage Mathew Street. One of the sites where one can always find something to eat and drink is Wetherspoon. It's like a franchise of pubs where you can have, of course, good pints of beer and at the same time, eat something typical from pubs: sandwiches, burgers, nachos...

MANCHESTER

The best place to go is the area of Canal St. Do not miss visiting Richmond Tea Rooms, where you can enjoy an extensive menu with delicious dishes, but remember to leave a gap to try one of their delicious cakes.

EDINBURGH

Nightlife areas are near the royal mille in the old town. Remember to make time for lunch or dinner at the baked potatoes shop: over 30 years offering good vegetarian or vegan food variety.

Lima increases its metro network

THE MINISTRY OF TRANSPORT AND COMMUNICATIONS OF LIMA IS EMBRACING AN AMBITIOUS INFRASTRUCTURE PLAN FOR THE CONSTRUCTION OF 6 SUBWAY LINES.

Lima's metro will travel through the capital of Peru. The increase in population that commutes daily to the city has led to convert it into a circulatory chaos. Currently, the city has a population of 9 million and at least 30% requires an efficient and fast transport. The Ministry of Transport and Communications designed the creation of six subway lines to improve transport conditions.

Currently, line 2 is already under construction, as well as the branch of the future line 4. Final works are taking place at the moment, as well as station location and air reserve for the remaining lines 3, 4, 5 and 6, which are, each, in different phases of the project. The Minister of Transport and Communications, Carlos Paredes, said earlier this year that all lines will be concessioned before 2016.

This investment in metropolitan rail transport aims to ensure urban transport to be more comfortable and secure.

Metro de Lima: Lines 2,3, and 4

LINE 2

CLICK HERE TO SEE THE VIDEO

The path of line 2 will go from East to West and will connect 13 districts. Works began last December and is estimated to be operational in 2020.

The works of Metro Lima's Line 2, along with the branch of line 4, includes the construction of 35 kilometres and 35 subway stations that will be completed in mid-2020. Line 2 will be 26.87 kilometres long, covering the East-West town. Starting in the district of Ate and ending at the port of Callao, the line will connect with 11 more districts: Santa Anita, San Luis, El Agustino, La Victoria, Brena, Jesús María, Cercado de Lima, San Miguel, La Perla, Bellavista, Carmen de la League, benefiting approximately 2.4 million people. In addition, line 4's branch to the airport will be built with a length of 8 km underground from Avenida Faucett to Avenida Néstor Gambetta, northbound. In addition, 8 stations will be built. When in operation, it will carry more than one million passengers daily between the district of Ate, located in the east of Lima and Callao port in just 45 minutes. Today, this journey takes two hours.

In addition to lower transportation time, the system will be safer and more efficient in environmental terms.

The project will begin operations with 42 fully automatic trains, each with capacity to carry 1,200 passengers at a frequency of three minutes during rush hour.

Access to the train will be fully automated with universal access, electric and mechanical escalators, elevators, permanent security and shall be accessible to people with disabilities. Choosing a subway system will allow less impact on the life of the city as well as a true urban transformation.

Spanish participation

This line 2 of Metro de Lima is a project that is under a public-private partnership and is considered the most important investment in the history of Peru infrastructure.

Once again, the brand Spain is present in the project. A consortium led by ACS and FCC has won the contract for the design, construction, finance, operation and maintenance of the line, amounting to 3,900 million euros. The consortium (called New Metro de Lima) is led by Dragados and Iridium, company Cosapi. Also, Metro de Madrid participates as advisor to the project.

The deadline for the construction phase is five years, followed by the operation phase that will take 30 years.

Moreover, the Spanish company Typsa will take care of the constructive design of the section of Line 2 between Benavides Station, located near the intersection of Av. Amezaga with Av. Benavides, to the port of Callao, and of the entire branch in line 4 (Av. Faucett-Av. Gambetta). In these sections, Typsa is responsible for the design of all elements of the subway system and the necessary ancillary works, involving a total of 14 km of tunnel with TBM and 14 underground stations excavated by the system cut & cover.

Project phases

The line will be developed in 3 phases:

- Phase 1A. Between Ate and Via Evitamiento (Santa Anita), the line will be completed, according to current estimates, in the second quarter of 2016. TBMs will be used with the traditional method and the excavations carried out in parallel. Due to the depth at which operate underground, between 10 and 25 meters, its impact on the outside will be minimal in terms of noise, vibration and emissions. About 15 meters per day will be excavated with these TBMs and therefore it will be possible to finish in schedule the 27 kilometres of tunnels that Line 2 has, as well as the 8 kilometres in line 4's branch.

- Phase 1B. Bolognesi Square to City of Ate, scheduled to enter in 2017. The tunnels will be carried out by traditional methods except the extension of Javier Padro, which will be carried out via the cave method.

- Phase 2. Murillo Park to Puerto del Callao and branch line 4, scheduled to be commissioned in June 2020.

LINE 3

The connection between the south and north of the city of Lima will take place with line 3. Although currently there is a pre-investment phase, Lima's Metro is estimated to have a length of 30 km.

Line 3, connecting the south and north of the city, is one of the six lines provided by the Basic Network of Metro de Lima. In December 2010, it was approved as part of the implementation of a transport system aimed at correcting the imbalances in public transport and gradually solve the problems of urban communication in Lima and Callao. It is a line which, according to ProInversión (a public private investment), will have an investment of 4,500 million euros.

Thanks to this line, at least six districts of the capital will benefit from it. Line 3 will go through Avenida Alfredo Benavides, Avenida Larco, Avenida Arequipa, Avenida Garcilaso de la Vega, Avenida Tacna, Avenida Pizarro, Avenida Túpac Amaru, Avenida Rosa de America, and finally Avenida Universitaria.

Granting line 3 includes the development of the definitive engineering studies (design), financing, construction, electromechanical equipment, rolling stock acquisition, operation and maintenance of the 32 kilometres long track.

Although there is still no date for the period of the concession, there is a cofinancing defined. Therefore, there will be financial contribution from the State.

In April 2013 the Ministry of Transport and Communications (MTC) commissioned ProInversión the process of promoting private investment in the implementation and development of the proposed line. Therefore, ProInversión signed in October 2014, a comprehensive consultancy contract with Metro-Tres Consortium, composed by Ingerop Conseil et Ingenierie, PricewaterhouseCoopers Corporate Finance, PricewaterhouseCoopers S. Civil de RL, Bustren PM, Alpha Consult and Metropolitana Milanese, for the studies of the project. Such pre-investment studies (profile and feasibility) search making a diagnosis and estimation of demand from primary sources, which will be obtained by investigations and field measurements, and develop the technical and operational approach of the project, as well as its costs and benefits.

Currently, the consultant is preparing the pre-investment study of the project, which aims to identify the best option (six to be evaluated) in relation to its relevance, social profitability and sustainability, among the possible alternatives. Once approved, the deadline for adjudication, route navigation and investment demand can be announced. As confirmed by ProInversión Andina, this study will be ready early in the second quarter of this year.

Meanwhile, the Ministry of Transport and Communications said the government also awarded the concession of line 3 by July 2016.

LINE 4

The east-west corridor will be conducted by Metro de LIma's line 4, connecting also with the international airport.

Lima's line 4 constitutes an east-west corridor, benefiting the population of at least ten districts in its area of direct influence. It will connect the district of Ate -Vitarte in the province of Lima, Jorge Chavez International Airport in Callao, specifically southwesterly along Javier Prado Avenue to La Marina Avenue, then towards the northwest on Elmer Faucett Avenue. It is estimated that the east-west underground section will be approximately 30 kilometres.

The project will be implemented via a public-private partnership and the winner will be responsible for the engineering design, financing, construction, supply of electromechanical equipment, rolling stock acquisition, operation and maintenance.

According to the ProInversión's website, on February 27th the consortium composed by Euroestudios S.L , Geocontrol Andina S.A.C, Geocontrol S.A , Tec - Cuatro S.A - Sucursal Peru , Consultoria Kapak S.A.C , Logit Engenharia Consultiva Ltda Y Qursor S.A.C won the Buena Pro for studies of metro line 4 with an economic proposal of 15 million euros.

This new contractor is responsible for the preparation of pre-investment studies for obtaining viability, as well as advising on the development and promotion of the Comprehensive Project Contest for the Project Concession. The bid opening will take place presumably along this current year.

SOME MAFEX PARTNERS IN LIMA'S METRO

BOMBARDIER SPAIN

Bombardier was responsible for Rail Control Solutions to Enhance Travel for More Passengers in Lima, Peru. Metro Lima project adds to Bombardier's presence in providing signalling solutions in fast-growing South American markets. Up to 350,000 passengers a day where expected to travel on the final extended Metro Lima Line 1, where Bombardier has delivered its BOMBARDIER CITYFLO 350 rail control solution. The upgrade to the metro line, including a final 12 km extension, is expected to reduce vehicle traffic in Peru's capital city significantly as well as cut carbon dioxide emissions by up to 32,000 tones each year. In delivering this project in a record time of 15 months, Bombardier has been responsible for the design, supply, installation and commissioning of equipment and satellite CITYFLO 350 board to line 21.4 km , including 16 stations , and 15 trains on the line. The supply includes automatic train protection EBI Cab 800, the interlocking EBI Lock 950, the detector station EBI and EBI Track 300 Switch 700 and centre systems Control EBI 2000. The team has also faced some major challenges technical, as this was also the first implementation of some of the art products of Bombardier, as EBI Lock 950 CBI Release 4 and EBI Track 300 units, as part of a CITYFLO 350 solution. Delivering this project in a record time of 15 months, Bombardier has been responsible for the design, supply, installation and commissioning of the CITYFLO 350 track and on-board equipment, for the 21.4 km line, including 16 stations, and the 15 trains running on the line. The supply included the EBI Cab 800 automatic train protection, EBI Lock 950 computer-based interlocking, EBI Track 300 train detection and EBI Switch 700 point machine and EBI 2000 control centre systems. The team also faced some major technical challenges, as this was also the first implementation of some of our latest generation products such as the EBI Lock 950 CBI Release 4 and the EBI Track 300 units, as part of a CITYFLO 350 solution.

IDOM

Given Idom's extensive international experience, the firm was selected to design a new Integrated Ticketing System for the Metro of Lima, the Bus Rapid Transport (BRT) network and the Integrated Transport System (ITS). This system will make it possible to use a single interoperable smartcard for all public transport in the metropolitan areas of Lima and Callao. The smartcard will replace the existing cards which are independent and incompatible between the different modes of transport. In addition, Idom is also designing various transportation projects in Lima such as the renovation of the Tacna- Arica rail line or improving urban transport in Lima and Trujillo.

INDRA

The multinational has equipped the emblematic infrastructure of line 1 of the electrical train of the Basic Metro Network of Lima and Callao in Peru with its passenger control systems using contactless technology, fire detection and extinction systems and telecommunications systems

This project consolidates Indra as one of the world leaders in technology for the railroad sector.

Indra has successfully implemented its contactless ticketing technology, telecommunications, fire detection and extinction systems for the second section of line 1 of the Metro in Lima.

The passenger control system implemented by Indra includes a completely contactless ticketing system, equipped with manual and automatic ticketing and access control systems, with a solution adapted to persons with reduced mobility, as well as systems for the solution's control and management. Contactless technology grants passengers access by simply moving a smart card over a reader, thereby speeding up access and making it more convenient, offering security and preventing possible fraud.

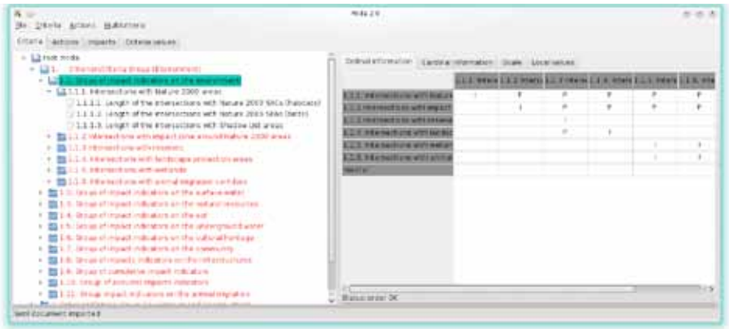
Indra has also managed the telecommunications systems, including both the main fiber-optic network comprising the digital transmission system, as well as networking systems that distinguish between the networks for operations and for administration, also included in the stations of section 1. These also integrate the IP telephony and emergency system, speaker system, timers, closed-circuit television and video and audio recording systems, amongst others. Likewise, the company has implemented the fire detection and extinction system.

TYPSA

Typsa is working on the final design of the Line 2 section that runs from Oscar Benavides Station, located near the junction between Avenida Amezaga and Avenida Benavides, to the Port of Callao, as well as the final design of the entire Line 4 branch line (Avenida Faucett to Avenida Gambetta). Line 2 will involve the construction of a total of 27 km of underground metro and 27 stations. The Avenida Faucett – Avenida Gambetta branch, part of the future Line 4, involves the construction of 8 km of underground metro and 8 stations, one of which is an important link to the airport, another a direct interchange with Line 2. Thanks to this project, the current two–hour journey between Ate and El Callao will be notably reduced to just 45 minutes. Typsa is responsible for the design of all the metro system elements and the necessary ancillary works, with a total of 14 km of TBM-bored tunnel and 14 cut & cover underground stations. Typsa has been working in Peru since 1994. In recent years, TYPSA Peru has made its mark on the local Peruvian consultancy sector, positioning itself among the top engineering firms in the country. As a result, the Spanish company has taken part in major projects, working for both private sector clients and the various government departments.

Software for "objective" choices. Multicriteria analysis.

IDOM HAS CARRIED OUT THE "Y HIGH SPEED LINE" PROJECT IN POLAND



View of the "Mcda 2.0" where it is shown the criteria tree and the scale of value for one criterion.

Idom has developed the project "Y High Speed Line in Poland" from the application of innovation value in design, subjecting the decisions to the multicriteria analysis: objective comparison between technical, environmental and financial criteria. Through its experience in large High Speed projects, IDOM has developed the software "Mdca 2.0" based on the methodology designated like Multi Criteria Decision Analysis (MCDA). The methodology follows the three main phases defined by Bana and Costa1 and applies techniques with a solid scientific base, in this case the MACBETH2 method for the construction of the evaluation model. The MCDA convinced the Client and the Stakeholders about the suitability of the chosen alternative. The methodology and conclusions of the multi-criteria analysis of the "Y High Speed Line in Poland" were evaluated and validated by the UIC[3].

1 Bana and Costa, C.A. (1992), "Structuration, construction and exploitation of a multicriteria model to support the decision"; PhD Thesis, Technical University of Lisbon.
2 On the mathematical foundations of Macbeth. (Carlos A. Bana e Costa, Jean-Marie De Corte and Jean-Claude Vansnick).
3 UIC: Union Internationale des Chemins de Fer

INNOVIA Monorail 300 system, awarded the Good Design Award

A DRIVERLESS TRANSPORT SYSTEM DESIGNED BY BOMBARDIER FOLLOWING THE PRINCIPLES OF ICONIC BEAUTY, MASS TRANSIT CAPACITY BUILDING AND FAST INFRASTRUCTURE.

Rail technology leader Bombardier Transportation has won a GOOD DESIGNTM Award for its Bombardier INNOVIA Monorail 300 system. This driverless transit system is designed on the principles of iconic aesthetics, mass transit capacity and fast-to-build infrastructure.
The INNOVIA vehicles incorporate Bombardier MITRAC propulsion equipment whose projects responsibility is for Bombardier plant in Trápaga, Vizcaya, which deals with the design and manufacture of such equipment. In addition, the dynamic tests of the first train test track and the necessary support for dynamic tests apply to equipment Trápaga customer.
The award also values the interior design of trains, the large amplitude with flexible seating that increase the capacity for mass transit and open gangways that allow passengers to move through the cars to enhance passenger flow, comfort and safety.

A Traction Power Saver tool for Metro de Medellin (Colombia)

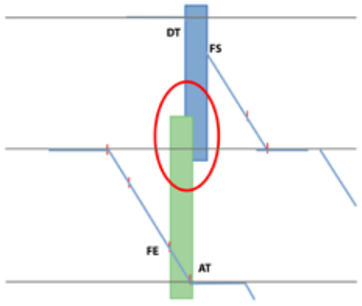
Since 2008, the Train Management System of Metro the Medellin (MdM) is "DaVinci", a cutting-edge platform developed by Indra which covers the whole lifecycle of a railway organization. Proof of DaVinci's spirit for continuously evolving, the Traction Power Saver (TPS) was developed three years ago. It was designed as a tool intended to optimize railway operational plans previously produced by DaVinci's Planner. Its output is an operational plan like the input one, except for the fact that it saves traction power by synchronizing arrivals at and departures from stations of a line.

Genesis of the Project

MdM and Indra signed in 2010 a contract which implied the development, deployment and put into service of a TPS module integrated within DaVinci.

Metro de Medellin was aiming for high level objectives: Planning power consumption for efficient operation; committing to sustainable growth and environmental performance; C2O minimisation concerning urban mobility; increasing quality of service without modification of the legacy assets.

The module was envisioned to take advantage of the MdM's railway electrification system and the characteristics of their rolling stock. Firstly, MdM's Line A and Line B can be seen as two closed electrical circuits (all the stations of a line belong to the same section of power rail). Secondly, MdM's trains have brakes that can feed back the electric network to a certain extent. Consequently, TPS focuses on the minuend of the global energy equation (ifigure 1)



DT: Departure Time From a station (train starts moving)
FS: Flat section of the running curve starts(train stops speeding up)
FE: Flat section of the running curve ends (train starts braking)
AT: Arrival Time in a station (train stops moving)

Development of the Project

TPS was designed to maximize the utilization of the energy from the regenerative braking by synchronizing braking and start between pairs of train services within a given electrical section (see figure 2).

TPS takes as input an operational plan produced by DaVinci's Planner. The output is an efficient operational plan which minimizes traction energy consumption while keeping similar dispatching times and target frequency.

Validation and Benefits

In this phase, we went deep into the concepts of "brake energy regeneration index" (the power rate a braking feeds back), "traction curves" of the trains (strength vs. speed), and "running curves between stations" (speed vs. space).

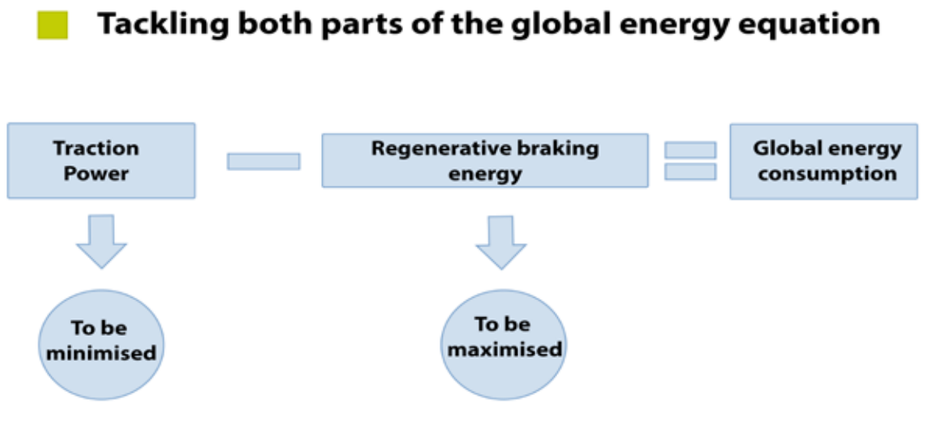
The algorithm mirrors the railway exploitation. Specifically, traction power saving depends on the operational plan to be optimized, the rail section, the calendar, the timetable frame (when the optimization focuses on non-rush hours, the saving is greater than when rush hours are involved), and the user constraints.

Finally, it should be underlined that, besides the money saving, a development project of this kind has yielded a number of stimulating positive side effects:

- Reviewing and consolidating the electrical topology of the track
- Adjusting or confirming the train's Brake Energy Regeneration Index
- Revisiting, sometimes correcting, elevation data and infrastructure speed restrictions
- Learning about the passenger demand for train services to be fulfilled
- Providing the MdM managers with more accurate reports
- Improving the service quality MdM offers to the city.

Authors. Carlos Redondo (MdM), Allan Guisao (MdM), José Miguel Rubio (Indra), and Julio Rives (Indra)

	HISTORICAL REFERENCE (KW*H)		SAVING (KW*H)		SAVING (PERCENTAGE)	
Calendar	Línea A	Line B	Line A	Line B	Line a A	Line B
Working Day	162,215	25,235	-1,223.95	6,221.3	-0.8%	24.7%
Saturday	161,041	25,764	4,118.43	6,453.5	2.6%	25.0%
Sunday/Holiday	102,258	18,792	5,917.68	5,609.3	5.8%	29.8%
Total when TPS is not applied to Line A on working days		**1,245,105**		**53,205**		**4.3%**



A comprehensive solution of railway operation analysis

INECO HAS DEVELOPED CRONOS, A COMPREHENSIVE SOLUTION THAT ALLOWS DESIGNING THE COMPLETE CYCLE OF THE HOLDING TO OPTIMIZE THE RIGHT SERVICE OF THE LINE

Planning is one of the key factors when it comes to achieving success in the operation of a railway line. Transport engineering and consultancy firm Ineco has developed a comprehensive solution which allows designing the whole cycle of the operation to be optimized, and therefore the appropriate service commencement of the line. The CRONOS tool allows for the unification of methodologies, for the agile share of the most updated of project information and to foster cross-communication.

This multilingual application allows to simulating the theoretical operation, as well as the study of a rail line in the phase of definition and planning. It determines the aptitude of a design according to applicable design legal standards, performs a traffic simulation to obtain an occupancy graphic, calculates the dimensioning of the fleet for a set number of travellers, and also carries out the real-time simulation of the impact of the security systems and the signaling in preset circulations.

Cronos supports the whole lifecycle for the planning of railway lines, from the alignment phase, through signaling, to the grid planning, so that it allows for all involved areas to have an overview on the latest version, in order to be able to revise calculations with the particularities introduced by designs carried out in parallel.

Its successful implementation in part of the Spanish railway network has been paramount in order to export it to highly relevant projects, such as the high speed rail line between Makkah and Madinah, in Saudi Arabia.

This application, which is in constant evolution, is upgraded by analising the needs of all parties involved, in order to become a high performance planning and design tool for the operation. An innovation product developed by Ineco in order to make technicians' work easier and to improve the efficiency of the project.

Using hybridization techniques with big data business intelligence techniques you can obtain all kinds of information about the activity.

‘A.U.R.A Desk’, a control base funded on the exploitation of BIG DATA

NEM SOLUTIONS LAUNCHES A SOLUTION FOR THE TOTAL CONTROL OF THE BUSINESS THANKS TO THE PROJECTION OF THE FUTURE OF COMPLEX ASSETS

The engineering company, NEM Solutions, hopes to establish themselves in the market with its tool “A.U.R.A. Desk”, a solution for the total business control in the rail field. This can be achieved thanks to the projection of the future of the complex assets of the business along with the consolidated economic and technical information. By merging Big Data techniques with Business Intelligence, the system generates several types of information related to company activity: assets’ future needs, performance, permanent comparatives, etc. And all in one single consulting point. A.U.R.A. Desk centralizes both economic and technical information along with assets’ health status, in order to avoid future failures through integrated condition based maintenance module. Everything is completely customizable and scalable. These advantages accrue if you consider that all this is offered in an innovative workstation, which creates an ideal environment for shared decision-making, allowing interaction around key information and intelligence for decision-making. We should recall that A.U.R.A. Desk gathers all the services and A.U.R.A. products as one single intelligent system for diagnostics developed by NEM Solutions that facilitates the O&M management optimization. This technology provides the knowledge and the learning capability to the machines and complex assets, which have symptoms that are self-detected, notifying these symptoms to the maintainer in order to take proper actions.

Hydrobush, an innovative active suspesion system

METALOCAUCHO HAS DEVELOPED AN ACTIVE SUSPENSION SYSTEM CONSISTING OF A JOINT GUIDANCE WITH INTEGRATED HYDRAULIC CUSHIONING.

Metalocaucho “Hydrobush”, a solution developed and patented together with CAF, is an active suspension system which consists of an elastomer spring with integrated hydraulic damping.The main advantage is its active suspension technology, which enables significant increase to the train speed on curves; the whole bogie dynamics are improved through the use of a variable damping system, which can vary the operating parameters whilst the vehicle is in service (by modifying the hole diameter, fluid viscosity, etc). Other advantages are the freedom to twist in all directions and, as other conventional guiding bushes manufactured by MTC, it can also withstand high loads and temperatures acting on the front axle, due to its high endurance strength, while of COURSEisolating all vibrations.
The advantage for some Operators (especially in the UK) is the reduction of TRACK access charges.

This solution has a freedom of movement in all directions.

New compact level crossing

THALES SPAIN HAS DEVELOPED THE COMPACT LEVEL CROSSING FIELDTRAC 6384. A LAST GENERATION EQUIPMENT TO IMPROVE THE PERFORMANCE OF CURRENT DEVICES, ENSURING MAXIMUM SAFETY, MINIMUM INVASION OF THE ENVIRONMENT AND REDUCED MAINTENANCE COSTS AND CONSUMPTION.

Thales Spain, a leading technological company in signalling, security, supervision and communications systems on railway lines and critical infrastructures, has achieved ADIF's approval for its new FieldTrac 6384 compact level crossing. This state-of-the-art equipment improves the performance of current devices to ensure optimal safety, minimal invasion of the environment and reduced maintenance and consumption costs.

The FieldTrac 6384 level crossing protection system is the result of the evolution in traditional level crossings towards a new modular concept that reduces the system's fit-out, installation and maintenance cost.

The new compact level crossing allows remote peripherals, railway signals and detection points to be controlled via radio link with the central command. The low consumption of the peripheral devices allows for photovoltaic energy supply, with savings in the installation associated with infrastructure costs for communications and energy.

Thales has also developed the necessary modules to ensure that the technology adapts to any kind of level crossing protected with light and sound signals; with semi-barriers or double barriers; automatic in-track and interlocked crossings or exclusively pedestrian crossings.

FieldTrac 6384 incorporates a recording subsystem, accessible remotely from anywhere, which records and processes the system's internal information in order to optimise both preventive and corrective maintenance tasks. FieldTrac 6384 has been developed according to the CENELEC 50126, 50128, 50129 and 50159 standards to meet the SIL4 safety level.

"Thales, and specifically our railway signalling team in Spain, has been working on this R&D project since 2009, and we are convinced of its expansion in Spain and on the international market, where we are currently working for potential markets and also on projects such as Cairo-Alexandria, where Thales is going to install the FieldTrac 6384 system", says Antonio Salazar, Head of Level.

Thales is a world leader in railway safety systems. In Spain, Thales is one of the principal suppliers of level crossing protection systems approved by ADIF, FEVE ad RENFE, with more than 650 installations located throughout the network.

Greater safety, low consumption and lower environmental impact are some of the advantages of the new Thales compact level crossing.

The system's modularity allows for optimal configurations in terms of fit-outs and installation.

The control cards used in the command module elements have been comprehensively tested in Thales interlocks in different countries.

New Traffic Control Center in La Sagrera oversees all lines of Metro de Barcelona

Metro Line 9 is still controlled independently from its CTC.

THIS TECHNOLOGY DEVELOPED BY RAIL AUTOMATION SIEMENS OFFERS BENEFITS THAT LEAD TO GREATER FLEXIBILITY FOR FUTURE EXPANSION OF NEW LINES.

The Metro Control Centre located in La Sagrera is equipped with state-of-the-art technology to supervise the metro lines and will allow more flexibility in future extensions.

Barcelona Metro line 9, equipped with the Siemens automatic driving system, is controlled independently from its own Centralized Traffic Control (CTC).

Barcelona Metro lines 1, 2, 3, 4, 5 and 11 are supervised from the new Centralized Traffic Control (CTC) located in La Sagrera Metro Control Centre and equipped with Siemens Rail Automation technology. The line 9, which is operated by Barcelona Metro and equipped with the Siemens driverless system, is controlled independently from its own Centralized Traffic Control.

The modernization of La Sagrera CTC with Siemens Rail Automation Controlguide Rail 9000 technology offers the best technological advantages to increase system flexibility and adaptability for future extensions. Additionally, from the operational point of view, it will provide on optimal human-machine interface and a higher level of ergonomics.

The functionality of the Controlguide Rail 9000 technology has been adapted to the demands of the client Transports Metropolitans de Barcelona (TMB) to ensure that their needs in terms of supervision and control are achieved for all the lines of the metro network. Controlguide Rail 9000 is a flexible system that allows functions such as the automatic route setting function and the regulation function. The interaction with other systems present in the OCC is granted through a safe interface with a dedicated, open protocol for exchanging information with external systems.

Monitoring is organized at different levels (operating, communication systems and track elements), reporting possible incidents according to the configuration requested by the customer. The main purpose is to make the operator's task as easy as possible, optimizing resources and operation.

Additionally, Siemens has implemented the signalling technologies in most of the Barcelona Metro lines: signalling and automatic train protection and operation systems (ATP/ATO) in lines 2 and 5; ATP in line 4; signalling, ATP/ATO without onboard agent and signalling in line 11 and ATP/ATO CBTC driverless in line 9.

UPCOMING MAFEX ACTIVITIES

COMMERCIAL DELEGATIONS

September 28 - October 2
United States
Los Angeles, San Diego, San Francisco

November 19-23
South Africa and Mozambique
Johannesburg and Maputo

November 28-December 3
Saudi Arabia
Riad, Damman and Jeddah

INVERSE MISSIONS

November 16-20
Business opportunities in rail freight transport and logistics
Valencia (Spain)

V INTERNATIONAL RAILWAY CONVENTION

From the 15th to 17th June 2015 the major operators, Infrastructure administrators and railway companies of 25 countries will meet with the spanish railway industry in Seville, Spain.

EXHIBITIONS

Presence with stand

April 22-24
Rail Solutions
Kuala Lumpur (Malaysia)

June 8-10
UITP World Congress & Exhibition
Milan (Italy)

Assistance

June 30 - July 1
Africa Rail
Johannesburg (South Africa)

July 7-9
UIC High Speed World Congress & Exhibition
Tokyo (Japan)

October 4-7
Railway Interchange
Minneapolis (United States)

INFRASTRUCTURE

Construction
- Assignia Infraestructuras, S.A.
- Parrós Obras, S.L.
- PRECON - Prefabricaciones y Contratas, S.A.U.
- Rover Alcisa, S.A..

Electrification
- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Arteche
- Idom
- Ineco
- Ingeteam Power Technology, S.A.
- La Farga Lacambra, S.A.U.
- Luznor
- Parrós Obras, S.L.
- Semi, S.A.
- Telice
- TYPSA

Maintenance
- Alstom Transporte, S.A.
- Amurrio Ferrocarriles y Equipos, S.A.
- Aquafrisch, S.L.
- Aries Ingeniería y Sistemas, S.A.
- Danobat
- Duro Felguera Rail, S.A.U.
- Ibertest, S.A.E.
- Idom
- Ikusi - Ángel Iglesias, S.A.
- Ineco
- Parrós Obras, S.L.
- Siemens Rail Automation, S.A.U.
- Telice
- Tectatom
- Thales España GRP, S.A.U.

Track material and equipment
- Alstom Transporte, S.A.
- Amurrio Ferrocarriles y Equipos, S.A.
- Aquafrisch, S.L.
- Arcelormittal España, S.A.
- Aries Ingeniería y Sistemas, S.A.
- Arteche
- Duro Felguera Rail, S.A.U.
- Elektra - Grupo Elektra, S.A.
- Funor, S.A.
- Hicasa - Hierros y Carbones, S.A.
- Ikusi - Ángel Iglesias, S.A.
- Idom
- Ineco
- Infoglobal, S.A.
- ITK Ingeniería, S.A.
- Jez Sistemas Ferroviarios, S.L.
- Parrós Obras, S.L.
- Redalsa, S.A.
- Siemens Rail Automation, S.A.U.
- Talleres Alegría, S.A.
- Thales España GRP, S.A.U.
- Valdepinto, S.L.

Enginering and consultancy
- Aquafrisch, S.L.
- Ardanuy Ingeniería, S.A.
- Aries Ingeniería y Sistemas, S.A.
- CAF Power & Automation
- Colway Ferroviaria, S.L.
- Getinsa Ingeniería, S.L.
- Ibertest, S.A.E.
- Ineco
- Idom
- ITK Ingeniería, S.A.
- LKS Ingeniería, S.Coop.
- MB Sistemas, S.Coop.
- NEM Solutions, S.L.
- Sener Ingeniería y Sistemas, S.A.
- Typsa

Security
- Actia Systems, S.A.U.
- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- DSAF. Dinámicas de Seguridad
- Idom
- Ikusi - Ángel Iglesias, S.A.
- Implaser 99, S.L.L.
- Ineco
- Infoglobal, S.A.
- Manusa Door Systems
- Siemens Rail Automation, S.A.U.
- Telice
- Thales España GRP, S.A.U.

Stations
- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Idom
- Ikusi - Ángel Iglesias, S.A.
- Ineco
- Infoglobal, S.A.
- LKS Ingeniería, S.Coop.
- Luznor
- Manusa Door Systems
- Parrós Obras, S.L.
- Thales España GRP, S.A.U.
- TYPSA

ROLLING STOCK

On board equipment and components
- Actia Systems, S.A.U.
- Albatros, S.L.
- AL-KO
- Alstom Transporte, S.A.
- Alte Technologies, S.L.U.
- Aries Ingeniería y Sistemas, S.A.
- Arteche
- CAF Power & Automation
- Cetest
- Elektra - Grupo Elektra, S.A.
- Fundiciones Garbi, S.A.
- Gamarra, S.A.
- Hispacold
- Ikusi - Ángel Iglesias, S.A.
- Indra
- Infoglobal, S.A.
- Ingeteam Power Technology, S.A.
- Metalocaucho, S.L.
- MGN Transformaciones del Caucho, S.A.
- P4Q Electronics, S.L.
- SEIB - Servicios Electrónicos Industriales Berbel, S.L.
- Siemens Rail Automation, S.A.U.
- Teknorail Systems, S.A.
- Thales España GRP, S.A.U.
- Valdepinto, S.L.

Manufacturing machinery and tools
- Aquafrisch, S.L.
- Aries Ingeniería y Sistemas, S.A.
- Cetest
- Danobat
- ITK Ingeniería, S.A.
- MB Sistemas, S.Coop.

Rolling stock manufacturers
- Alstom Transporte, S.A.
- Bombardier España
- CAF - Construcciones y Auxiliar de Ferrocarriles, S.A.
- Cetest
- ITK Ingeniería, S.A.
- Patentes Talgo, S.L.
- Talleres Alegría, S.A.
- Vossloh España, S.A.

Interiors
- Alstom Transporte, S.A.
- Alte Technologies, S.L.U.
- Colway Ferroviaria, S.L.
- Idom
- Industrias E. Díaz, S.A.
- Kelox, S.A.
- LKS Ingeniería, S.Coop.
- Teknorail Systems, S.A.
- Valdepinto, S.L.

Maintenance
- Albatros, S.L.
- Alstom Transporte, S.A.
- Aquafrisch, S.L.
- Aries Ingeniería y Sistemas, S.A.
- CAF - Construcciones y Auxiliar de Ferrocarriles, S.A.
- Cetest
- Danobat
- Ibertest, S.A.E.
- Ikusi - Ángel Iglesias, S.A.
- Industrias E. Díaz, S.A.
- Ingeteam Power Technology, S.A.
- Kelox, S.A.
- Luznor
- Metalocaucho, S.L.
- NEM Solutions, S.L.
- Patentes Talgo, S.L.
- Siemens Rail Automation, S.A.U.
- Talleres Alegría, S.A.
- Tectatom
- Teknorail Systems, S.A.
- Vossloh España, S.A.

Traction and control
- Alstom Transporte, S.A.
- CAF Power & Automation
- Cetest
- Ingeteam Power Technology, S.A.
- P4Q Electronics, S.L.
- Patentes Talgo, S.L.

Security
- Actia Systems, S.A.U.
- Albatros, S.L.
- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Cetest
- DSAF. Dinámicas de Seguridad
- Idom
- Ikusi - Ángel Iglesias, S.A.
- Implaser 99, S.L.L.
- Indra
- Infoglobal, S.A.
- Luznor
- Siemens Rail Automation, S.A.U.
- Thales España GRP, S.A.U.

SIGNALLING AND TRAFFIC CONTROL
- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Bombardier España
- Cables de Comunicaciones Zaragoza
- CAF Signalling
- DSAF. Dinámicas de Seguridad
- Getinsa Ingeniería, S.L.
- GMV Sistemas, S.A.U.
- Idom
- Ikusi - Ángel Iglesias, S.A.
- Implaser 99, S.L.L.
- Indra
- Ineco
- Luznor
- P4Q Electronics, S.L.
- Semi, S.A.
- Siemens Rail Automation, S.A.U.
- TECSA - Técnicas Electrónicas y Componentes, S.A.
- Telice
- Thales España GRP, S.A.U.
- Typsa

TELECOMMUNICATIONS
- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Cables de Comunicaciones Zaragoza
- CAF Power & Automation
- Getinsa Ingeniería, S.L.
- Idom
- Ikusi - Ángel Iglesias, S.A.
- Indra
- Ineco
- Infoglobal, S.A.
- P4Q Electronics, S.L.
- Siemens Rail Automation, S.A.U.
- Telice
- Thales España GRP, S.A.U.
- Typsa

TICKETING SYSTEMS
- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Calmell Group
- Idom
- Ikusi - Ángel Iglesias, S.A.
- Indra
- Manusa Door Systems
- Thales España GRP, S.A.U.

ORGANISM/ ADMINISTRATION
- Cetren

OTHERS
- Cetren
- Elektra - Grupo Elektra, S.A.
- Ibertest, S.A.E.
- LKS Ingeniería, S.Coop.
- Tectatom

ACTIA SYSTEMS, S.A.U.

- **Pol. Ind. Los Olivos - Calidad, 66**
  28906 Getafe (MADRID)
- **P: +34 91 665 26 26**
- **F: +34 91 665 23 24**
- **sales@actiasystems.com**
- **www.mobility.actia.com**

Actia is a company based in Spain with a number of subsidiaries in more than 15 countries, devoted to the research, design and manufacturing of electronic platforms, on board and fixes systems, using the latest technologies for the railway industries, not just in security, information and entertainment but also in the communication and transferring of data. It´s available with a wide range of electronic equipment and services which meets all needs for different means of public transport like High Speed train, InterCity, Regional train, Suburban train, Train-Tram, Tram and Underground.

Actia partakes in each stage of the manufacturing process of its products: analysis of needs, design systems, equipment manufacturing, set up service, warranty period, substitution y renovation.

Thanks to Actia innovatory efforts and staff, it has more than 100 applications in Spain, USA and the UK.

ALBATROS, S.L.

- **Ruiz de Alarcón, 13 - 3º**
  28014 Madrid (MADRID)
- **P: +34 91 495 70 00**
- **F: +34 91 495 70 06**
- **af@albatros-sl.es**
- **www.albatros-sl.es**

Albatros Corporation is specialised in the design, manufacture, commercialization, and maintenance of equipment for the railway industry. Albatros is formed by various units of engineering and manufacture in Spain as other countries. We have a team of over 500 employees, selling over 100 million Euros a year, specially on export markets, with over 27,000 static converters, 35,000 passenger information systems, 6,000 HVAC systems, 10,000 WC modules and a variety of designs for the exterior as the interior of the trains, metros and tramways all over the world.

AL-KO

- **Ctra. Durango-Elorrio, 25**
  48220 Abadiano (BIZKAIA)
- **P: +34 94 621 57 40**
- **F: +34 94 681 37 04**
- **erik.geluk@al-ko.es**
- **www.al-ko.com**

AL-KO, a pioneer in the manufacture of shock absorbers in Spain, offers wide range of shock absorbers and suspension elements, backed by its engineering versatility that provides innovative technical solutions to meet the needs of its customers.

This fact has lead AL-KO, to carry out -in all its plants- major investments in research and testing facilities, as well as in expansions and refurbishments with the objective of implementing a flexible, efficient and profitable production, also in small series.

All this serves to make AL-KO a competent party in developing effective solutions in the field of suspension.

ALSTOM TRANSPORTE, S.A.

- **C/ Martínez Villergas 49, edificio V**
  28027 Madrid (MADRID)
- **P: +34 91 334 58 00**
- **F: +34 91 334 58 01**
- **fernando.sunyer@transport.**
  alstom.com
- **www.alstom.com**

As a promoter of sustainable mobility, Alstom Transport is the only railway manufacturer present in the full spectrum of transport systems, equipment and services.

The company offers a complete range of high performance products: rolling stock, signalling, maintenance and modernisation, infrastructure and integrated solutions.

In Spain, Alstom Transport employs around 2000 people in 19 working sites, has a manufacturing site in Barcelona and develops R&D programmes both for rolling stock and railway signalling and safety projects.

The technological laboratory located in Madrid has become a benchmark for signalling projects throughout the world.

ALTE TECHNOLOGIES, S.L.U.

- **Pol. Ind. El Plà**
  Camí de Can Gurri, 1
  08185 Lliçà de Vall (BARCELONA)
- **P: +34 93 840 70 12**
- **F: +34 93 861 85 61**
- **info@alte-technologies.com**
- **www.alte-technologies.com**

Alte Transportation, S.L. main activities are design, sales, manufacturing and maintenance of Toilet Modules with vacuum systems, Air Conditioning systems and Modular Interiors. All these products are designed with our own technology and they are specifically designed for the railway sector.

Alte main facilities are in Lliçà de Vall (Barcelona, Spain) and Raimat (Lleida, Spain). The company has more than 100 staff and extended network of agents worldwide with annual turnover of 18 million Euro. Our knowhow is built on 25 years doing several interior projects

AMURRIO FERROCARRIL Y EQUIPOS, S.A.

- **Maskuribai, 10**
  01471 Amurrio
  (ARABA)
- **P: +34 945 89 16 00**
- **F: +34 945 89 24 80**
- **info@amufer.es**
- **www.amufer.es**

Amurrio Ferrocarril y Equipos, S.A. is one of the international market leaders in the design, production and installation of railway materials. Our rolling stock interchanges and crossings are installed in high-speed rail lines, underground lines, tram lines, and conventional railways throughout Europe, Asia, America and Africa.

In the area of metal foundry, we have the experience, the knowledge and the people to produce, process and mechanize machine tool parts and sets of great technical complexity in carbon steel manganese steel and other steel alloys.

AQUAFRISCH, S.L.

- **C/ Ignacio Zuloaga, 10**
  28522 Rivas Vaciamadrid
  (MADRID)
- **P: +34 91 380 03 33**
- **F: +34 91 778 60 02**
- **aquafrisch@aquafrisch.com**
- **www.aquafrisch.com**

Aquafrisch is a service oriented company. Our task is to provide our customers needs with reliable results. Aquafrisch provides a wide offer in equipment and services in both working fields for the company:

1.- Aquafrisch Rail: solutions for railway equipment in depots and workshops.

2.- Aquafrisch Agua: solutions for water treatment both in consumption and waste waters.

ARCELORMITTAL ESPAÑA, S.A.

- **Apdo. 570. Edificio Energías, 2ª pl.**
  33691 Gijón (ASTURIAS)
- **P: +34 985 18 71 67**
- **fernando.sainz-varona@**
  arcelormittal.com
- **www.arcelormittal.com/**
  rails+specialsections

ArcelorMittal is the world's leading steel and mining company and it is part of a small group of rail manufactures whose production has developed notably in the specialized high-speed, heavy- haul, metro, conventional lines and other applications are light rail and tram in the different qualities of normal carbon steel, micro alloyed and head hardened rails.

ArcelorMittal quality has been recognized by customers around the world, from Europe through Asia to Oceania, America and Africa.

Next time you travel by train, no matter the continent where you are, you may be doing it on rails manufactured by ArcelorMittal.

ARDANUY INGENIERÍA, S.A.

- **Avda. Europa, 34**
  28023 Madrid (MADRID)
- **P: +34 91 799 45 00**
- **F: +34 91 799 45 01**
- **madrid@ardanuy.com**
- **www.ardanuy.com**

Ardanuy is a consultancy company that specializes in studies, designs, works management and technical consultancy pertaining to Rail, Metro, Tram and Cable Transport.

The company was founded in December 1992 and is made up of a team of over 100 Engineers and Architects. Other experts also act as consultants to Ardanuy staff on specific projects.

In Spain, Ardanuy carries out work from offices in Madrid, Barcelona, Valencia, Seville and Tenerife. It also has offices in Lithuania, Poland, India, Colombia, Algeria and USA.

Ardanuy has always had a marked international vocation. Currently over 90% of new contracts are won on the international market, in Western Europe: United Kingdom, Ireland and France; Central and Eastern Europe: Poland, Bulgaria, Latvia, Lithuania; America: Bolivia, Chile, Colombia, Mexico, Peru, USA; Africa: Morocco, Mozambique, Algeria, Egypt, South Africa; and Asia: India, Vietnam, Kazakhstan.

ARIES INGENIERÍA Y SISTEMAS, S.A.

- **Paseo de la Castellana, 130**
  28046 Madrid (MADRID)
- **P: +34 91 570 27 37**
- **F: +34 91 570 27 66**
- **mrey@aries.com.es**
- **www.ariestesting.com**

Aries Ingeniería y Sistemas is a worldwide leading company specialized in turn-key test systems projects for the railway industry (rolling stock and infrastructure). Aries's services range from feasibility studies and concept design, to turn-key solutions, including maintenance.

Aries develops its own state-of-the-art technology, which it incorporates into its solutions.

The company, is featuring over 25 years of experience in the sector, also offers client-specific R+D consulting for both: railway rolling stock and infrastructure.

Aries relies on its modern technology and its highly qualified team to create successful and efficient solutions. Aries is present in more than 22 countries, employs a strategy directed at specific markets which allows a strong, stable, and profitable growth. The company has offices in Madrid, Miami and Shanghai.

ARTECHE (ELECTROTÉCNICA ARTECHE SMARTGRID, S.L.)

- **Derio Bidea, 28**
  48100 Mungia (BIZKAIA)
- **P: +34 94 601 12 00**
- **F: +34 94 615 56 28**
- **ilh@arteche.es**
- **www.arteche.com**

Arteche Group's business is focused on providing equipment, applications and solutions for the electricity and railway sector worldwide. In power generation, transmission, distribution, industry, and railway technologies, the group has become a key player in the search for answers to new challenges. A position maintained by a deep knowledge of the different international electricity systems, efficient client-oriented organization and remarkable investment in research and development.

This is shown by over 50% increase in the brand references in the past five years. Arteche's decisions over the years made our group a symbol of reliability, quality and trust, both in solutions and in corporate relations. Corporate alliances have taken a key role in Artechе's's history, becoming and asset which has contributed to our international

growth and to the development of innovative solutions.

ASSIGNIA INFRAESTRUCTURAS, S.A.

- **Avd. Quitapesares 11**
  Pol. Emp. Villapark
  28670 Villaviciosa de Odón,
  (MADRID)
- **P: +34 91 567 28 70**
- **F: +34 91 571 96 28**
- **info@assignia.com**
- **www.assignia.com**

Assignia Infrastructures is a company that is part of the Essentium Group, which is based in Spain.

It has international experience in the development, execution, management and operations of large infrastructure projects of all kinds, including concessions and services.

Assignia has participated in all high-speed railway projects in Spain. Its experience is reflected in the various projects developed including infrastructures, superstructures, stations, new lines or renovations of lines in circulation that include: high-speed, conventional and sub-urban lines, trams and metros, the expertise in the sector is complemented by performing maintenance works thereof.

The in-house machinery park (available for widths 1,435 and 1,668 mm), the flexibility and international presence of the company in countries like Mexico, Venezuela, Turkey, Morocco, India, Algeria and Chile, gives Assignia an unquestionable distinction in the railway sector.

AZVI

- **C/ Almendralejo, 5**
  41019 SEVILLA
- **P: +34 954 999 320**
- **F: +34 954 999 200**
- **azvi@azvi.es**
- **ww.azvi.es**

Azvi is a hundred-year-old Company specialised in Civil Works whose origins are in railways, forming part of the history and evolution of the railways and its infrastructures in Spain and abroad.Throughout these years, Azvi has participated in numerous construction, rehabilitation, conservation and maintenance projects over more than 1,000 kilometres of track, of which almost 450 km have been High-Speed Rail built within the last 25 years. Azvi also has a large and modern machinery park which allows the company to carry out works with its own machines and a Logistics Centre equipped with modern facilities and state of the art resources in order to centralize a variety of support services to railway activity, such as MachineryPark, materials, maintenance, checking and repairing shops. Research and Development is also an important issue for Azvi. Through its own R&D department, Azvi invests in railway research and development, in collaboration with various public and private entities and investigation groups.

BOMBARDIER ESPAÑA

- **Avda. Burgos, 17**
  Complejo Triada-Torre A
  28036 Madrid (MADRID)
- **P: +34 91 383 62 00**
- **F: +34 91 383 61 98**
- **susana.bargsten@es.transport.bombardier.com**
- **www.bombardier.com**

Bombardier Transportation, a global leader in rail technology, offers the broadest portfolio in the rail industry.

Bombardier Transportation Spain is one of the leading exporters of the Spanish railway industry, employing more than 750 people in its plants and offices in Trápaga (Biscay), San Sebastian de los Reyes and Alcobendas (Madrid), Madrid and Barcelona, and taking part in some of the major railway projects in the country.

Its Propulsion Systems plant located in Trápaga (Biscay) and its Centre of Excellence in Rail Signalling Engineering located in San Sebastian de los Reyes (Madrid) are world top technological centres, leading the requests for Bombardier's propulsion and signalling systems for Spain and for the rest of the world. Exports represent already more than 85% of its activity.

CABLES DE COMUNICACIONES ZARAGOZA

- **Polígono de Malpica,**
  Calle D, nº 83
  50016 Zaragoza
  (ZARAGOZA)
- **P: +34 976 72 99 00**
- **F: +34 976 72 99 72**
- **comercial@cablescom.com**
- **www.cablescom.com**

Founded in 1971, Cables de Comunicaciones has been steadily building its reputation as a respected business in the field of communications cables. Cables de Comunicaciones has cemented its position and its products are now used in over 50 countries around the world. The company has a wide range of products that are certified according to the standards of the leading telecomm and railway operators in the majority of countries in Europe. It is dedicated to designing and developing excellent telecommunications, signalling, instrumentation, data and fibre optic cables.

CAF - CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, S.A.

- **Padilla, 71 - 6**
  28006 Madrid (MADRID)
- **P: +34 91 436 60 00**
- **F: +34 91 436 60 11**
- **caf@caf.net**
- **www.caf.net**

CAF is a firm focused on investigation, development, design, production and maintenance of Rolling stocks for the railway industry. Our product range include from High Speed, to regional and suburban trains, articulated units, underground trains, LRVs, light underground trains and locomotives. Maintenance of the whole range. It boasts production premises throughout Spain (Beasain, Irun, Zaragoza, Castejón and Linares), as well as in the USA (Elmira NY), France (Bagnères de Bigorre), Mexico (Mexico Df) and Brazil (Sao Paulo) and Rail Technological Centres in Beasain and Zaragoza. CAF's projects are distributed in over 25 countries around the world in the five continents.

CAF POWER & AUTOMATION

- **Parque Tecnológico de San Sebastián. Pso. de Mikeletegi, 58 - 2º. 20009 San Sebastián (GIPUZKOA)**
- **P: +34 943 30 92 51**
- **F: +34 943 30 92 52**
- **info@cafpower.com**
- **www.cafpower.com**

CAF P&A is a global manufacturer of electric power solutions as well as information and communications systems for the rail industry. CAF P&A have equipped more than 5,000 vehicles world wide including, metros, light rail, locomotives and high-speed trains. One of the main strategic lines is the development of its own technology. To do so, as a major asset, CAF P&A has a team of experienced, competent and dynamic specialists. CAF P&A develops, manufactures and deliver high reliability solutions adapted to each and every client's specific needs in compliance with railway standards.

CAF SIGNALLING

- **C/ Sepúlveda, 7B**
  28108 Alcobendas (MADRID)
- **P: +34 91 798 27 50**
- **F: +34 91 661 37 51**
- **cafsignalling@cafsignalling.com**
- **wwww.cafsignalling.com**

CAF Signalling, the technological subsidiary of the CAF Group, provides rail traffic signalling, both in Spain and abroad.

As such, it offers railway signalling solutions and remote control for Railway infrastructures.

CAF Signalling, boats the Company's own in-house engineering and expertise to take on "turn-key" railway signalling projects with recognition from several Railway Administrations in Spain and other countries in Europe, America, Africa, Middle East and Asia.

CALMELL GROUP

- **Pol. Ind. Pla d'en Coll**
  C/ Fresser, 12 C
  08110 Montcada i Reixac
  (BARCELONA)
- **P: +34 93 564 14 00**
- **F: +34 93 564 58 22**
- **calmell@calmell.net**
- **www.calmell.com**

The first company of the group, Calmell, S.A. was founded in 1970, focusing its activity on the manufacture or graphic products. Currently, the Calmell Group is the leader in access control and identification, through its companies Calmell S.A., Affix S.L., Idoneum S.A., which are respectively engaged in producing the supports (tickets, cards,…), developing specific software and hardware, personalization and security.

In the public transport sector it works for integrators and operators supplying any kind of support for ticketing and reader/writer systems.

With a strong international presence through its network of representatives and distributors, the Calmell Group is able to satisfy your needs on a global level.

CETEST

- **Lazkaibar, s/n**
  20200 Beasain (GIPUZKOA)
- **P: +34 943 028 690**
- **cetest@cetestgroup.com**
- **www.cetestgroup.com**

Test and analysis services for:

- Design verification and validation.
- Full homologation of new products and vehicles.
- Failure analysis and optimization.

Fully accredited test lab with more than 40 years of experience in railway testing.

Test services cover the following areas:

- Structural components.
- Running gear.
- Suspension systems.
- Vehicle dynamics.
- Noise and vibrations.
- Aerodynamics.
- EMC and energy consumption.
- Mechatronics.
- Special instrumentation (Instrumented wheelsets, instrumented pantograph).

CETREN

- **C/ Sierra de Cazorla, 1 – Las Matas**
  28290 Las Rozas
  (MADRID)
- **T. Certificación: +34 91 127 97 27/ 97**
- **T. Formación: +34 91 127 92 27/ 29**
- **Certificación: cetren@cetren.es**
- **Formación: formacion@cetren.es**
- **www.cetren.es**

Cetren, as expert on the railway sector, has over 30 years experience in promoting and certifying the quality in this sector. Our experience and exclusive dedication to railways allows us to offer global solutions for certification, as the Spanish Notified Body according to European Interoperability Standards and also acting as Independent Safety Assessor and Certification Entity of rail products, processes and services.

Cetren is also the first private center expert in railway staff training, as approved by the Ministry of Public Works and Transport since 2007.

COLWAY FERROVIARIA, S.L.

- **Ganduxer, 5-15 - Desp. 4**
  08021 Barcelona (BARCELONA)
- **P: +34 93 414 65 12**
- **F: +34 93 414 16 64**
- **acolomerf@colway-08.com**
- **www.colway-08.com**

Colway Ferroviaria,S.L., company belonging to the COLWAY Group, specializes in the design, engineering, manufacture, supply, installation and commissioning of turnkey railway vehicle interiors. Through the integrated management of modular supplies, based on experience, knowledge, research and innovation, the company achieves the satisfaction of the needs and expectations of its customers: railway manufacturers and public administrations.

Colway capabilities include Modular System solutions for Rail Interiors as Toilet Modules, Front hoods, saloons,

walls, Buffet, Restaurant areas, vestibules.

DANOBAT

- **Arriaga Kalea, 21**
  20870 Elgoibar
  (GIPUZKOA)
- **P: +34 943 748 044**
- **F: +34 943 743 138**
- **danobat@danobat.com**
- **www.danobat.com**

Danobat Railways business unit focuses its activity in the supply of turnkey solutions for the manufacturing and maintenance of railways rolling stock, incorporating own products of leading technology, together with those manufactured by specialized companies.
It gathers extensive experience and qualification in the rendering of services such as engineering services, equipment integration, complex project management, and collaboration with the customer all along the life of the project.
Danobat has a strong international presence and references in the most relevant customers.

DSAF – DINÁMICAS DE SEGURIDAD, S.L.

- **Avda. de San Blas nº 13 -**
  Polígono Industrial de Gojain 01170
  Legutiano (ARABA)
- **P: +34 945 466 314**
- **F: +34 945 466 314**
- **info@dsaf.es**
- **www.dsaf.es**

DSAF is a company structure devoted to People's Movement Safety. It is committed to providing new technologies applied to design and project implementation, as well as initiatives that guarantee an approved evacuation safety level in this generalized risk society.
Emergency signalling is DSAF's main application area; it develops photoluminescent, electroluminescent and LED signalling systems for people evacuation in risk situations and environments: tunnel evacuation safety, vessel evacuation safety, building evacuation safety…
DSAF safety applications are developed in three big areas: tunnel safety (road / railway), safety in vessels, and buildings.

DURO FELGUERA RAIL, S.A.U.

- **Pol. Ind. Fábrica de Mieres s/n**
  33600 Mieres
  (ASTURIAS)
- **P: +34 985 45 63 31**
- **F: +34 985 45 61 64**
- **dfrail@durofelguera.com**
- **www.durofelguera.com**

DF Rail is a Spanish company specialized at the design, manufacturing and supply of turnout systems and components for Metro, Conventional, Heavy Haul or High Speed Lines. Turnouts, single and double crossovers, diamond crossings, single and double slip crossings, single and double junctions, switch expansion joints, ..., on wooden or concrete sleepers; for ballasted or unballasted tracks; for single or combined gauges; with monobloc Mn steel crossings or with swing nose crossings; insulated glued joints; transition rails.

ELEKTRA-GRUPO ELEKTRA S.A.

- **C/ Apostolado, 34**
  20014 San Sebastián
  (GIPUZKOA)
- **P: +34 607 94 29 73**
- **railway@elektra-sa.es**
- **www.grupoelektra.es**

Grupo Elektra is a market leader in the field of electrical and electronic equipment distribution for manufacturers of rolling stock, maintenance and railway equipment manufacturers.
Being the leading company in the railway sector in the supply of electrical equipment. Your solution provider in electrical products for railway, with specific tecnical support.
Elektra Group is composed of an extensive Spanish national network and has companies in Romania, India and USA.

FAIVELEY TRANSPORT IBERICA, S.A

- **Pol. Ind La Drecera – c/ Mecánica,**
  23 – 43470 La Selva del Camp
  (TARRAGONA). c/Antonio Cabezón
  s/n – 28034 Madrid (MADRID)
- **T: +34 917282159**
- **F: +34 917282157**
- **jesus.delatorre@faiveleytransport.com**
- **www.faiveleytransport.com**

FUNDICIONES GARBI, S.A.

- **Bº Munsaratz, 33**
  48220 Abadiano (BIZKAIA)
- **P: +34 94 621 54 80**
- **F: +34 94 681 73 86**
- **garbi@fundicionesgarbi.es**
- **www.fundicionesgarbi.es**

Founded back in 1972, Fundiciones Garbi has evolved from a traditional foundy to a Global Service Company for industry.
We offer a full catalogue of services starting from the casting or other materials till delivery of "ready to use" parts or assembly sets. With this aim, we have developed an organization oriented towards solid and competitive processes, ensuring quality from design phase using APQP tools. Well aware of customer satisfaction, we offer to our clients additional global services including a full range of heat treatments, machining, product inspection and testing (NDT's, etc), protection and finishing surface treatment (Painting, Metallization, Others...), including final assembly of different parts. For the Railway industry we are specialized on production of rolling stock material.

FUNOR, S.A.

- **Pol. Ind. de Villalonquejar**
  C/ Condado de Treviño, 41
  09001 Burgos (BURGOS)
- **P: +34 947 29 84 80**
- **F: +34 947 29 82 93**
- **info@funorsa. es**
- **www.funorsa.es**

Castings in carbon steel, alloy steel and stainles steel.
Our products:
- Steel casting.
- Raw castings or fully machined.

Examples:
- Bogie components.
- Pivots.
- Motor housings.
- Pressure rings.
- Axle boxes.
- Links...

GAMARRA, S.A.

- **Portal de Vergara, 6**
  01013 Vitoria (ARABA)
- **P: +34 945 25 16 77**
- **F: +34 945 27 49 48**
- **gamarra@gamarrasa.es**
- **www.gamarrasa.es**

Gamarra, S.A. at a glance: Spanish steel foundry -located at Vitoria Gasteiz- annual production: 4,000 tons - customers: European State Railways, - producers of rolling stock and their subsuppliers - as foundry and supplier homologated by DB AG (HPQ), ÖBB, SBB, SNCF (AFQ) (extract) as well as according to DIN EN ISO 9001: 2000 + DIN 6700 - 2.
Products: brake discs, brake block shoe holders, buffers, spigots and essential steel castings for bogies.

GETINSA INGENIERÍA, S.L.

- **C/ Ramón de Aguinaga, 8**
  28028 Madrid (MADRID)
- **P: +34 91 456 09 82**
- **F: +34 91 456 09 83**
- **internacional@getinsa.es**
- **www.getinsa.es**

Established in 1984, Getinsa Ingeniería, S.L. has grown into a top engineering firm in Spain and an international benchmark in the transport and environmental sectors. In Spain, Getinsa has played a leading role both in the modernization of the conventional railway and in the development of the new High Speed railway network. Our services include project management and engineering & consultancy services, involving all phases of the project, from feasibility studies up to commissioning and technical assistance for the operation and maintenance of railway infrastructure. Our experience covers civil works, track and platform, signaling and telecommunication systems, as well as electrification (electric substations, overhead lines, etc.). We are currently working on railway projects in Europe, Middle East, Africa, Asia, South America and USA.

GMV SISTEMAS, S.A.U.

- **Juan de Herrera, 17 - P.T.B.**
  Boecillo
  47151 Valladolid (VALLADOLID)
- **P: +34 983 54 65 54**
- **F: +34 983 54 65 53**
- **ahernandez@gmv.com**
- **aags@gmv.com**
- **www.gmv.com**

Since 1994 GMV provides Intelligent Transport Systems, offering turnkey solutions and specific products. GMV develops applications adapted to sector needs, including satellite navigation, mobile communications, passenger information, fare collection systems and monitoring-and-control centers.
GMV's railway portfolio includes fleet management system, SAE-R®, providing operators with an all-in system for planning and management, and other products like CCTV, PA-Intercomm and Passengers Video Information, as well as electronic fare collection systems for railway sector.

HICASA - HIERROS Y CARBONES, S.A.

- **Polígono de Asipo, P48**
  33428 Cayés-Llanera (ASTURIAS)
- **P: +34 985 26 04 73**
- **F: +34 985 26 09 05**
- **info@hicasa.com**
- **www.hicasa.com**

HICASA specialises in the storage, transformation, distribution and commercialisation of railway materials, rails and railway accessories of all types in accordance with both European (UNE EN), as well as American (ASTM) Standards, not to mention others such as AREMA, etc. HICASA belongs to a private group of companies, GEVIR, which is made up of four enterprises in Spain, and is special in the sense that it combines its role of distributor with that of manufacturer, given that it possesses its own specialist light rail factory, a fact which endows it with a unique market profile. We can boast of a roofed surface area at our installations of over 13,000 $m^{2,}$ where we dispose of modern cutting and drilling machines that enable us to transform iron and steel and to supply orders of any format and measurement, in accordance with the specifications requested by our clients. We export over 50% of our products abroad.

INTERNACIONAL HISPACOLD, S.A

- **Avda. Hacienda San Antonio,1**
  Pol. Ind. El Pino
  41016 Sevilla (SEVILLA)
- **p: +34 954 677 480**
- **F: +34 954 999 728**
- **hispacold@hispacold.es**
- **www.hispacold.es**

Hispacold is a World leader company for climate systems specialized in comfort for people with more than 30 years' experience.
Hispacold designs and manufactures HVAC solutions for all rail vehicles: trams, metros, EMUs, DMUs, LRVs… with proven and reliable technology solutions.
In Hispacold each activity is based on a solid quality culture and on a real commitment with the environment. Quality certifications ISO 9001, ISO 14001, OSHAS 18001 are only the smallest part of this working way.
Hispacold is a company of Irizar Group SC, which employees more than 3.000 people in the five continents and has a global turnover of more than 550 Million €. This gives Hispacold the benefits from a multinational organization while maintaining an individual company spirit.
Hispacold's presence in the five continents guarantees the best technical assistance at any place of the world.

IBERTEST, S.A.E.

- **Ramón y Cajal, 18-20**
  28814 Daganzo de Arriba (MADRID)
- **P: +34 91 884 53 85**
- **F: +34 91 884 50 02**
- **www.ibertest.es**

Ibertest is a company that since 1970, designs and manufactures machines and complete laboratory installations "Turn Key" for high precision materials testing. Our equipment offers a global solution for R&D Investigation and Quality Control of all types of materials, englobing static and dynamic testing of the different elements in conventional and high speed railway, that includes: Tracks, Sleepers, Track Support Assembly, bogies & etc. Our solutions guarantee the high demanding safety requirements established by national and international standards.

IDOM

- **Zarandoa 23**
  48015 Bilbao (VIZCAYA)
- **P: +34 94 479 76 40**
- **F: +34 94 475 93 64**
- **cortega@idom.com**
- **oscar.rico@idom.com**
- **www.idom.es**
- **cortega@idom.com**
- **oscar.rico@idom.com**
- **www.idom.es**

Idom is one of the european leading companies in the field of professional services in engineering, architecture and consultancy. It is an independent company established in 1957 and it has participated in over 30.000 projects in five continents. In 25 countries with 42 offices throughout Angola, Arabia, Argelia, Belgium, Brazil, Canada, Chile, Colombia, Ecuador, France, Germany, India, Laos, UAE, Spain, U.S.A., Libya, Morocco, Mexico, Peru, Poland, Portugal, Rumania, Turkey and United Kingdom.

More than 2.500 staff posseses the expertise and experience to cover all the phases of a railway project (high speed, conventional, freight, metro, light rail, tramway, depot and workshops..), from conception to commissioning and beyond.

Idom will accompany the client by providing the correct technical assistance required for the decision-making process: technical specifications for design, alternatives studies, demand and traffic studies, financial and socioeconomical analysis,basic and detailed design, operational and maintenance plans,works supervision, testing and commissioning.

IKUSI - ÁNGEL IGLESIAS, S.A.

- **Paseo Miramón, 170**
  20014 San Sebastián (GIPUZKOA)
- **P: +34 943 44 88 00**
- **F: +34 943 44 88 20**
- **movilidad@ikusi.com**
- **www.ikusi.com**

Ikusi offers integral solutions for exploiting the diverse means of urban public transport (Bus/BRT/Tramway/Light Rail/Metro/Suburban), as well as in intermodal transport hubs. One proposal, backed up with a track record reaching back more than 20 years in the sector, has the main goal of improving passenger experience, guaranteeing safety, increasing revenue from secondary sources independent from the main activity, and streamlining operational efficiency.

IMPLASER 99, S.L.L.

- **Pol. Ind. Borao Norte, Nave 5A**
  50172 Alfajarín (ZARAGOZA)
- **P: +34 902 18 20 22**
- **F: +34 902 18 20 22**
- **international@implaser.com**
- **www.implaser.com**

Implaser is a Spanish company focused in developing innovative security signs for railway projects. Innovation and quality are our mainstays, as we were the first SME being certified in R+D+I in Spain. Implaser has all the range of products certified by AENOR with photoluminescent values of 150, 300, 580 and 720 mcd/m^2.

We are also specialized in the manufacturing of informative, security and accessibility stickers for coaches, to be used both indoor and outdoor.

Hard work and great concern for innovation has allowed us to develop new products, such as photoluminescent systems combined with electroluminescent and guiding systems by LEDs.

INDRA

- **Avda. de Bruselas, 35**
  28108 Alcobendas (MADRID)
- **P: +34 91 626 88 58**
- **F: +34 91 626 88 68**
- **dmeza@indra.es**
- **www.indra.es**

Indra is a world leader and pioneer in the supply of technological platforms for railway operations management, control and supervision, having specific solutions already tested on high speed and conventional lines and metropolitan operations. Indra is also a leader in ticketing systems for transport operators and has facilities and projects all over the world.

Furthermore, Indra develops high-precision safety and signalling systems.

At this moment in time, Indra's solutions are completely unique because of their high level of integration and adaptation to the current and future necessities of the railway environment whatever may be the most state of the art technological and operative options. Indra has managed to open a competitive market for the first time based on technological and economical competitiveness.

INDUSTRIAS E. DÍAZ, S.A.

- **Ctra. de Castellón, Km. 6,2**
  52720 La Cartuja (ZARAGOZA)
- **P: +34 97 645 40 07**
- **F: +34 97 645 40 13**
- **m.eugenia@industrias-ediaz.com**
- **www.industrias-diaz.com**

Industrias E.Díaz, S.A. founded in 1968, manufactures side and cab WINDOWS for railways, metro and tram.

It counts with highly qualified personnel as well as a technical staff able to make any kind of design. Its facilities of 11,000 m^2 of built, contains the most sophisticated technology and means of test and homologations.

It is certificated ISO 9001:2000. In order to respect the environment, it does not use hexavalent chrome in its modernt installations of chemical treatments, decreasing toxic substances emissions.

INECO

- **Paseo de la Habana, 138**
  28036 Madrid (MADRID)
- **P: + 34 91 452 12 00**
- **nacional@ineco.com**
- **international@ineco.com**
- **www.ineco.com**

Global leader in transport engineering and consultancy, it has contributed to the development of transport infrastructures for over 45 years in more than 45 countries. Its high level technical specialisation allows its activity to diversify into new markets and reinforce its presence in those where it is already established. Its participation in the whole railway system in Spain has led the company to develop important international projects like the Makkah-Madinah high speed in Saudi Arabia, the Ankara-Istanbul line in Turkey and the HS2 project in the United Kingdom.

INGETEAM POWER TECHNOLOGY, S.A.

- **Edificio 702**
  Parque Tecnológico de Bizkaia
  48160 Derio (BIZKAIA)
- **P: +34 94 655 90 00**
- **F: +34 94 403 98 37**
- **traction@ingeteam.com**
- **www.ingeteam.com**

Ingeteam is an expert leader in the development of electrotechnical and power electronics systems providing involving energy exchanges at large.

Our capacities and the experience on the railways sector allow us to offer technological solutions that significantly contribute to reach our customers´ strategic objectives, leading to maximize operational efficiency.

We strive towards on offering in-house/ state-of-the-art developments for.

ITK INGENIERÍA, S.A.

- **Parque Científico Tecnológico de**
  Gijón - Parcela 5 - Edificio ITK
  33203 Gijón (ASTURIAS)
- **P: +34 985 35 50 00**
- **F: +34 985 35 70 50**
- **itk@itk-ingenieria.es**
- **www.itk-ingenieria.es**

One line of business in which ITK has become involved has been the development, supply and assembly of installations and equipment for the rail sector.

ITK's work takes in all aspects of a project, starting with the precise definition of the needs of the client to offer an integrated solution that brings together construction, production, environmental and personnel aspects via analysis, calculation and engineering.

Installations, vehicles and equipment are delivered in an operational state with their corresponding operating and maintenance manuals and even training courses for outside staff, integral maintenance for the life of said installations and a complete after-sales and repair service.

JEZ SISTEMAS FERROVIARIOS, S.L.

- **Arantzar, s/n**
  01400 Llodio (ARABA)
- **P: +34 94 672 12 00**
- **F: +34 94 672 00 92**
- **infor@jez.es**
- **www.jez.es**

JEZ Sistemas Ferroviarios, S.L. is committed to designing, manufacturing, supplying and maintenance of all types of manganese steel switches and railway track systems, in addition to moulded cast steel parts for the general industry.

Our Technical Department (Department of R&D) ensures we have the capability of designing and producing points and crossings (turnouts, crossovers, scissor crossovers and diamond crossings) or parts for them, such as hard steel manganese crossings or spare tongues.

At JEZ Sistemas Ferroviarios, S.L. we fit our developments to meet clients needs.

KELOX, S.A.

- **Isla de Jamaica, 8**
  28034 Madrid (MADRID)
- **P: +34 91 334 15 90**
- **F: +34 91 358 05 64**
- **marketing@kelox.es**
- **www.kelox.es**

Kelox launched its railway activity in 1977, manufacturing catering equipment for dining cars on longdistance lines.

The experience and knowledge acquired over the years have become Kelox specialist in the design and full supply of galleys and catering equipment for high-speed, shuttle and regional trains.

Our style of design is characterised by harmony; it is beautiful, ergonomic and functional, always according to the customer specifications.

LA FARGA LACAMBRA, S.A.U.

- **Ctra. C-17z - Km. 73,5**
  08508 Les Masies de Voltregà
  (BARCELONA)
- **P: +34 93 859 40 20**
- **F: +34 93 859 55 30**
- **josep.anfruns@lafarga.es**
- **www.lafarga.es**

La Farga Lacambra is a model company in the railway sector, with more than 200 years' experience in the copper industry. A solid international presence and continuous innovation in the search for new alloys have enabled it to pro-

duce high-service materials.
La Farga Lacambra provides global solutions for copper materials and its alloys such as CuMg, CuSn or CuAg, integrating the whole productive process and ensuring the maximum technical qualities. These products satisfy the needs of the market for all kind of lines and speeds around the world.

LKS INGENIERÍA, S. COOP

- **Goiru kalea, 7**
  20500 Arrasate
  (GIPUZKOA)
- **P: 902 03 04 88**
- **F: 943 79 38 78**
- **arrasate-mondragon@lksingenieria.com**
- **www.lks.es**

Through more than 25 years of existence, LKS DIARADESIGN has experienced a progression toward its consolidation on areas such as transport design, engineering and transport infrastructure.
Rolling Stock Design: Design consultancy, Concept design,Exterior styling, Interior styling,Design engineering, Branding, colour & trim. Railway Infrastructure: Feasibility studies, Landscape architecture, Infrastructure design, Technical assistance, Program & Project Management, Environmental consulting.

LUZNOR

- **Paduleta, 47**
  01015 Vitoria (ARABA)
- **P: 945 200 961**
- **F: 945 200 971**
- **iarbeloa@luznor.com**
- **www.luznor.com**

Luznor Company is specialized in the design, manufacture and commercialization of professional torches (for railway industry), emergency lighting (for industry and architecture) and other Electronic devices.
Luznor offers you (in its factory in Vitoria) highly qualified technicians, a high standard of quality, an effective system development, manufacture and testing, and above all, a philosophy of commitment to our customers allowing us to offer innovative products equipped with advanced technology and recognized prestige.

MANUSA DOOR SYSTEMS

- **Avda. Via Augusta, 85-87 - 6ª planta.**
  08174 Sant Cugat del Vallès
  (BARCELONA)
- **P: + 34 902 321 400**
- **P: +34 935 915 700**
- **F: +34 902 321 450**
- **F: +34 932 185 610**
- **manusa@manusa.com**
- **www.manusa.com**

Manusa is the Spanish market leader in design, production, installation and maintenance of automatic door systems. Established in 1966, it has 12 delegations in Spain, branches in Portugal, Brazil, Singapore and India and international presence in more than 70 countries around the world. Manusa develops specific products for public transport, such as platform screen doors (PSD) and ticket gates for access control, as well as one-way corridors, onboard doors and tunnel partitioning doors, always with the Manusa technology support.

MB SISTEMAS, S. COOP.

- **Pol. Ind. Igeltzera -**
  C/ Igeltzera, 8
  48610 Urduliz (BIZKAIA)
- **P: + 34 94 403 06 26**
- **F: + 34 94 403 06 27**
- **amacias@mbsistemas.es**
- **www.mbsistemas.es**

MB SISTEMAS is part of MONDRAGON CORPORATION.
We develop turnkey "World Class" engineering projects, implementing automation solutions into the Assembly and welding phases of manufacture process for car body structures of railroad passenger cars.
We give "ad hoc" solutions for the customer's needs; having implanted successfully our facilities around the world.
As engineering we develop both, robotic installations and special machines for any assembly process.

METALOCAUCHO, S.L.

- **Polígono Erratzu, 253**
  20130 Urnieta (GIPUZKOA)
- **P: +34 943 33 37 55**
- **F: +34 943 33 37 51**
- **info@metalocaucho.com**
- **www.metalocaucho.com**

MTC specialises in the design and manufacture of anti-vibration and suspension solutions for Rolling stock.
The Company was established in 1982 and currently has three manufacturing sites, located in Spain (HQ), China and India. In 2009 the company was awarded IRIS Certification.
MTC, being among the leading companies in its sector, supplies to the main Rolling stock Constructors worldwide, including Alstom, Bombardier, CAF, CSR, CNR, Hyundai Rotem, Siemens, Talgo, Vossloh).
We also collaborate with Operators for the supply of spare components for their overhaul projects.
Our main products are rubber-metal primary and secondary suspensions, focusing on primary springs (conical or chevron type), guiding bushes, guiding links, secondary air springs and emergency springs, traction rods, elastic bushings, buffers, layer springs as well as a diverse range of associated rubber-metal solutions.

MGN TRANSFORMACIONES DEL CAUCHO, S.A.

- **C/ Candelaria, 9 - Pol. Ind. Camino del Calvario**
  28864 Ajalvir (MADRID)
- **P: +34 91 887 40 35**
- **F: +34 91 884 45 84**
- **enp@mgncaucho.com**
- **www.mgncaucho.com**

MGN was established in 1957 and since then it has been developing its activity both designing and manufacturing rubber-metal components, mainly for the railway industry.
MGN invests in research and innovation as a basis for the development of elements to be adapted in the new understanding of passenger and fright trains, taking the lastest technological advances of the rubber world, vibration control and damping systems.

NUEVAS ESTRATEGIAS DE MANTENIMIENTO, S.L.

- **Paseo Mikeletegi, 54 - 2º**
  20009 Donostia (GIPUZKOA)
- **P: +34 943 30 93 28**
- **F: +34 943 30 93 26**
- **gparada@nemsolutions.com**
- **www.nemsolutions.com**

We focus on maintenance optimization, developing intelligent systems for the O&M of rolling stock assets. We offer fleet performance and subsystems health monitoring, early failure symptoms detection and automated generation of maintenance plans based on predefined business objectives such as availability and cost.

P4Q ELECTRONICS, S.L.

- **Ctra. Bilbao-Balmaseda, Km. 9**
  48810 Alonsotegi (BIZKAIA)
- **P: +34 94 498 20 28**
- **ialberdi@p4q.com**
- **www.p4q.com**

At P4Q we are involved in the complete development of electronic devices and lean production services. We are structured as an integral supplier of electronics solutions, focused in flexibility and quick development. We design under customer specs and approval. Being a partner of our customers giving global support attending local production demands. Is the basis of our strategy. We have facilities in Albuquerque (NM), USA as well as in Spain.

PARRÓS OBRAS, S.L.

- **Ctra. Virgen del Monte, 1**
  13260 Bolaños de Calatrava
  (CIUDAD REAL)
- **P: +34 926 88 47 05**
- **F: +34 926 88 47 06**
- **rocio@parros.es**
- **www.parros.es**

Family business with over 25 years experience in civil construction and iron and steel industry for the railway sector. Parros Group which is specialized in pile driving and catenary foundations, has implemented the 80% of the foundations of the entire Spanish High Speed Network.
Whether conventional railway network or Highspeed Railway (AVE), PARROS GROUP is distinguished by the versatility of our machines adapted "Ad hoc" for auxiliary civil works from the railway, with automatic switching to the three Spanish gauges. Also innovative is our implementing system of noise barriers from the railway track and its foundations. Generic activities of building and general construction.

PATENTES TALGO, S.L.

- **C/ Paseo del Tren Talgo, 2**
  28290 Madrid (MADRID)
- **P: +34 91 631 38 00**
- **F: +34 91 631 38 93**
- **marketing@talgo.com**
- **www.talgo.com**

Talgo, leading High Speed rolling stock manufacturer in Spain, has over 70 years of experience manufacturing very high speed, high speed, intercity and regional trains, tilting passenger coaches and locomotives.
The company is also a pioneer in providing complete maintenance solutions to railway operators worldwide, and is specialized in the design and manufacture of maintenance equipment for any type of rail vehicles.

PRECON; PREFABRICACIONES Y CONTRATAS, S.A.U.

- **C/ Espronceda, 38, local 3**
  28003 Madrid (MADRID)
- **P: +34 91 343 03 48**
- **F: +34 91 359 12 46**
- **fsanchez@precon.cemolins.es**
- **ferroviario@precon.cemolins.es**
- **www.cemolins.es**

PRECON is the Spanish leader in design and supply of precast concrete products for railway tracks, either ballasted and ballastless tracks.
PRECON has supplied solutions based on monoblock, twinblock, block, slabs and sleepers for switches and crossings. Either for high speed, conventional lines, heavy haul, subways and tramways. PRECON from its two Spanish factories has supplied more than 15 millions twinblock sleepers, 5 millions monoblock sleepers, 500,000 ml sleepers for switches and crossings and currently manufacture most of the slab track systems in use in Spain.

REDALSA, S.A.

- **General Solchaga, s/n**
  P. I. de Argales, Apdo. 719
  47008 Valladolid (VALLADOLID)
- **P: +34 983 27 13 16**
- **F: +34 983 27 37 68**
- **redalsa@redalsa.com**
- **www.redalsa.com**

- Rail electrical welding LBS are arranged to form 288 meters for high-speed train strecht and convencional rail network.
- Engeneering services and integral management for electrical welding factories and management of rail stockpiles.
- Regeneration of used rails to make LBS.
- Providing fastening complet systems. Manufacture of metalic elements for diferents fastening systems. Iron sheets J2.L1 or P50 for J2 and Elastic fastening clips SKL-1, SKL14, SKL12 and new variant to "Fast-Clip".
- Rail ultrasonic inspection, using hand-held equipment and self-propelled movil equipment until 90 Km/h.
- Maintenance and repair work of train

coaches in our factory. Our facilities are equipped with 3 Km of railway and 3 railway access to RFIG. We have all the necessary traction resources of 1668 track width.

- Thermal aluminium welding kits distribution.

ROVER ALCISA, S.A.

- **C/ Ochandiano, 18 - Edificio A Parque Empresarial El Plantío 28023 Madrid (MADRID)**
- **P: +34 91 444 44 80**
- **F: +34 91 444 44 81**
- **aleon@roveralcisa.com**
- **www.roveralcisa.com**

The Rover Alcisa Group came into being in 1962, and brought together its corporate activities in Construction, Property Development, Engineering, Mining Extraction and New Technology, giving rise to a diversified corporate group ready to take on new investments.

The Rover Alcisa Group is present on all fronts and in all fields of civil works. Indeed, its position as leader is plain to see.

It has a wealth of experience in all kinds of overland infrastructures: highways, dual carriageways and motorways. In addition to its strong position in this sector, it also has a notable and unique presence in railway infrastructure: high-speed, metro and tram.

Its involvement in one-of-a-kind projects as part of the Spanish rail network turned this corporate group into one of only a handful throughout Spain specializing in large-scale projects whose implementation is technically complex.

SEIB- SERVICIOS ELECTRÓNICOS INDUSTRIALES BERBEL, S.L.

- **Calle de San José, 6 (Nave 19) 28320 - Pinto (MADRID)**
- **P: +34 91 692 53 71**
- **F: +34 91 692 60 98**
- **seib@seib.es**
- **www.seib.es**

We are designers of products and electronic processes that since 1994 industrialize the knowledge of our clients in their products.

Currently, SEIB boasts the most advanced range of products and services on the market in industrial electronics and an own Know-How present in all activities of the company, from the simplest solutions to more complex developments and projects.

In 2008, we started the development of own products and now launched the generation 2.0 in which we apply the design to reduce the consumption of raw materials and processes, using components and cutting-edge techniques to increase functionality and reduce the cost of products in rolling stock.

What do we have to change about these products to transform into that you need?

SEMI, S.A. (GRUPO ACS)

- **Manzanares, 4 28005 Madrid (MADRID)**
- **P: +34 91 701 77 00**
- **F +34 91 521 85 97**
- **ferrocar@semi.es**
- **www.semi.es**
- **www.grupoacs.com**

A society in international expansion. With the adaptability of a small business, the infrastructure of a big company and the financial backing of a large group. SEMI is encompassed in the major companies of Industrial Services sector of the ACS group. Focused in the industrial field, SEMI build infrastructures for energy, transport, communication, environment and non-residential building. Activity in the railway area: Electrification and Traction Substations for AC and DC, Auxiliary Electrical Equipment, Engineering and Consulting, Maintenance of Catenary and Substations, Infrastructure for Railway Signaling and Communications.

SENER INGENIERÍA Y SISTEMAS, S.A.

- **Severo Ochoa, 4 (PTM) 28760 Tres Cantos (MADRID)**
- **P: +34 91 807 70 8 / 717 4**
- **F: +34 91 807 87 32**
- **dep.infra@sener.es**
- **www.sener.es**

Sener is one of the leading engineering and technology groups in Europe with over one billion euros of annual turnover, more than 5,000 professionals and a continuously growing international presence with offices in more than 15 countries. In the field of railway engineering, Sener count on an extensive experience in metros, light rail trains systems and tramways, conventional railway line, freight transport and High Speed Lines. Sener's activities range from preliminary, conceptual and feasibility studies, basic and detailed engineering to project management services, supervision of works, value engineering or ICE services.

SICE TECNOLOGÍA Y SISTEMAS

- **c/ Sepúlveda, 6 -Pol. Ind. Alcobendas 28108 Alcobendas MADRID**
- **P +34 916232200**
- **F: +34 916232201**
- **sice@sice.com**
- **www.sice.com**

SIEMENS RAIL AUTOMATION S.A.U.

- **Ronda de Europa, 5 28760 Tres Cantos (MADRID)**
- **P: +34 91 514 80 00**
- **www.siemens.es/railautomation**

Siemens Rail Automation is the resulting Company after the acquisition of the Invensys Rail Dimetronic group by Siemens. The new division offers integrated mobility solutions through the most advanced technologies for railway signalling and train control.

Our main purpose is the supply of "turn-key" projects, including all the phases of design, development, supply, manufacturing, installing, testing, commissioning and maintenance of railway signalling systems and automatic train control systems for either mass transit applications as main line and high speed lines.

The solutions and systems of Siemens Rail Automation allow railways and metropolitan networks to improve the safety of their railway application; increase the capacity of the lines; reduce operating costs; optimize maintenance works; obtain a better usage of its rolling stock, having at the same time lower energy consumptions rates and to decrease energy consumption.

TALLERES ALEGRÍA, S.A.

- **C/ Peña Santa, 7 - P.I. Silvota 33192 Llanera (ASTURIAS)**
- **P: +34 985 26 32 95**
- **F: +34 985 26 60 1**
- **talegria@talegria.com**
- **www.talegria.com**

Talleres Alegría with more than 100 years at the service of railway´s networks, offers to its customers a wide range of fixed track equipment with the best quality and service conditions.

Following its own technical design or its customer's, Talleres Alegría manufactures among other turnouts for High Speed Lines, conventional Lines, subway and Tramway lines, as well as End Forged Switch Points and Track Vehicles.

Being aware of the relevance of comfort within the railway sector, Talleres Alegría has collaborated with leading companies developing and applying technical solutions for mitigating noise and vibrations during the crossing over the turnouts.

TECTATOM

- **Avda. Montes de Oca, 1 San Sebastián de los Reyes 28703 Madrid (MADRID)**
- **P: +34 91 659 8600**
- **F: +34 91 659 8677**
- **correo@tecnatom.es**
- **www.tecnatom.es**

Tecnatom has more than 50 years of experience in the application of Non Destructive Testing (NDT) to the inspection of components.

It also offers its high technological level in the development and application of inspection systems and techniques to the railway market, where security and quality control are increasing required.Tecnatom can provide its depth knowledge on materials currently used or tested in the railway sector (metals or new materials carbon-fiber based), taken advantage of its activities in the nuclear and aerospace sectors.

The main fields where it is carrying out activities in the railway sector are:

- Inspection services for infrastructures and rolling stock
- Development of inspection techniques and procedures
- Development of inspection equipment and systems (ultrasonics, eddy currents) for rail transport components (track, axles, bogies, wheels)
- Training of operators on Non-Destructive Testing (NDT) techniques
- Development of training simulators for train drivers

TECSA - TÉCNICAS ELECTRÓNICAS Y COMPONENTES, S.A.

- **P.I. Pla d'en Coll - Carrer del Mig, 35 08110 Montcada i Reixac (BARCELONA)**
- **P: +34 93 575 10 16**
- **F: +34 93 575 21 52**
- **marketing@tec-sa.es**
- **www.tec-sa.es**

Founded in 1985, TECSA is specialist in customized connections and harnesses assemblies. Our goal is simplifying the manufacturing process offering assemblies ready to connect.

Our experience and excellent materials' know-how, have provided Tecsa an excellent position in the market as a high quality harnesses manufacturer. Furthermore, we distribute some other electric products:

- Tapes and Adhesives from 3M (Preferential Distributor for Spain).
- Epoxy and Poliurethan resins from Elantas Camattini (Exclusive distributor for Spain).
- Heat Shrinkable tubing from Plastronic (Exclusive distributor for Spain and Portugal).

We have been offering quality and personalized service during more than 25 years fulfilling with market needs and requirements.

Moreover, all our harnesses and assemblies are tested 100%.

TEKNORAIL SYSTEMS, S.A.

- **Paseo de la Castellana, 91 28046 Madrid (MADRID)**
- **P: + 34 91 515 60 00**
- **F:+ 34 91 564 72 86**
- **info@teknorail.com**
- **www.teknorail.com**

Teknorail Systems, S.A. is a company belonging to the EUROFINSA Group, whose activity focuses on the development of railway interior projects, aimed both for the refurbishment of existing vehicles and also for new rolling stock, with a scope of supply that ranges from the design and engineering to the industrialization and material supply, including the technical assistance to the car commissioning.

Teknorail's main goal is to provide its customers with high-quality solutions for railway interiors by means of innovation, global project management, modular supply and flexible solutions.

TELICE

- **Pol. Ind. Onzonilla, 2ª fase 24391 Ribaseca (LEÓN)**
- **P: +34 987 22 10 04**
- **F: +34 987 26 44 07**
- **telice@telice.es**
- **www.telice.es**

Telice is a Spanish company with 39 years of experience in several fields of technology installation, especially for the railway sector.

Our activities cover design, installation and maintenance for Railway Electrification Systems, Railways Safety and Signalling, Optical Fiber, Industrial Automation and Electrical Installations.

Our extensive experience has made Telice a preferred partner for carrying out work and providing services for important railroad administrations and major construction and technology companies in the railroad industry.

THALES ESPAÑA GRP, S.A.U.

- **Serrano Galvache, 56 Edificio Álamo 4º, Planta Sur 28033 Madrid (MADRID)**
- **P: +34 91 273 76 80**
- **F: +34 91 273 78 67**
- **jose.villalpando@thalesgroup.com**
- **www.thalesgroup.com**

Thales is a World leader in Mission Critical Solutions for Land Transportation. Thales Spain, with more tha 60 years of experience, has been pioneer and leader in the

technological development of the Spanish railways, beein one of the main suppliers of safety and telecommunication systems for the Spanish Railways Administrations and present in countries as Turkey, Mexico, Algeria, Malaysia, Egypt and Morocco.
Its activity goes from the development, manufacturing installation, commissioning to the maintenance of equipments and systems for railway signalling, train control, Telecommunication, Supervision ticketing and critical infrastructures security.

TYPSA

- **C/ Gomera, 9**
  28703 San Sebastián de los Reyes
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- **F: +34 91 651 75 88**
- **madrid@typsa.es**
- **www.typsa.com**

Typsa Group is one of the most important European consulting groups and leader in the fields of civil engineering, architecture and the environment. Since its creation, in 1966, Typsa Group's ever-increasing activities, having focused both on preliminary assessment and on design, as well as supervision and/or management of construction projects in Europe, the Americas, Africa and the Middle East. Typsa is one of the most experienced Spanish consulting firms in the field of railways and metro systems. We have been involved in more than 4,700 km of High Speed lines (HSL), 2,600 km of conventional lines, 390 km of conventional metro and 450 km of tram and light-rail transits.

VALDEPINTO, S.L.

- **Calle Águilas, 9 - Nave 11**
  28320 Valdepinto (MADRID)
- **P: +34 91 691 42 68**
- **F: +34 91 691 57 03**
- **lauraparra@valdepinto.net**
- **www.valdepinto.com**

Valdepinto, S.L. was established in 1986 and focuses its activities in the Railway sector.
We have four main product lines:

- All types of machining (specialists in electrical insulation).
- Screen printing, Signs and Engraving low-relief.
- Metal transformation and welding.
- Design and fabrication of transformers and coils of high/low voltage.

Our philosophy is to always offer all our clients an unbeatable value for Money, combined with an excellent service.

VOSSLOH ESPAÑA, S.A.

- **Pol. Ind. del Mediterráneo**
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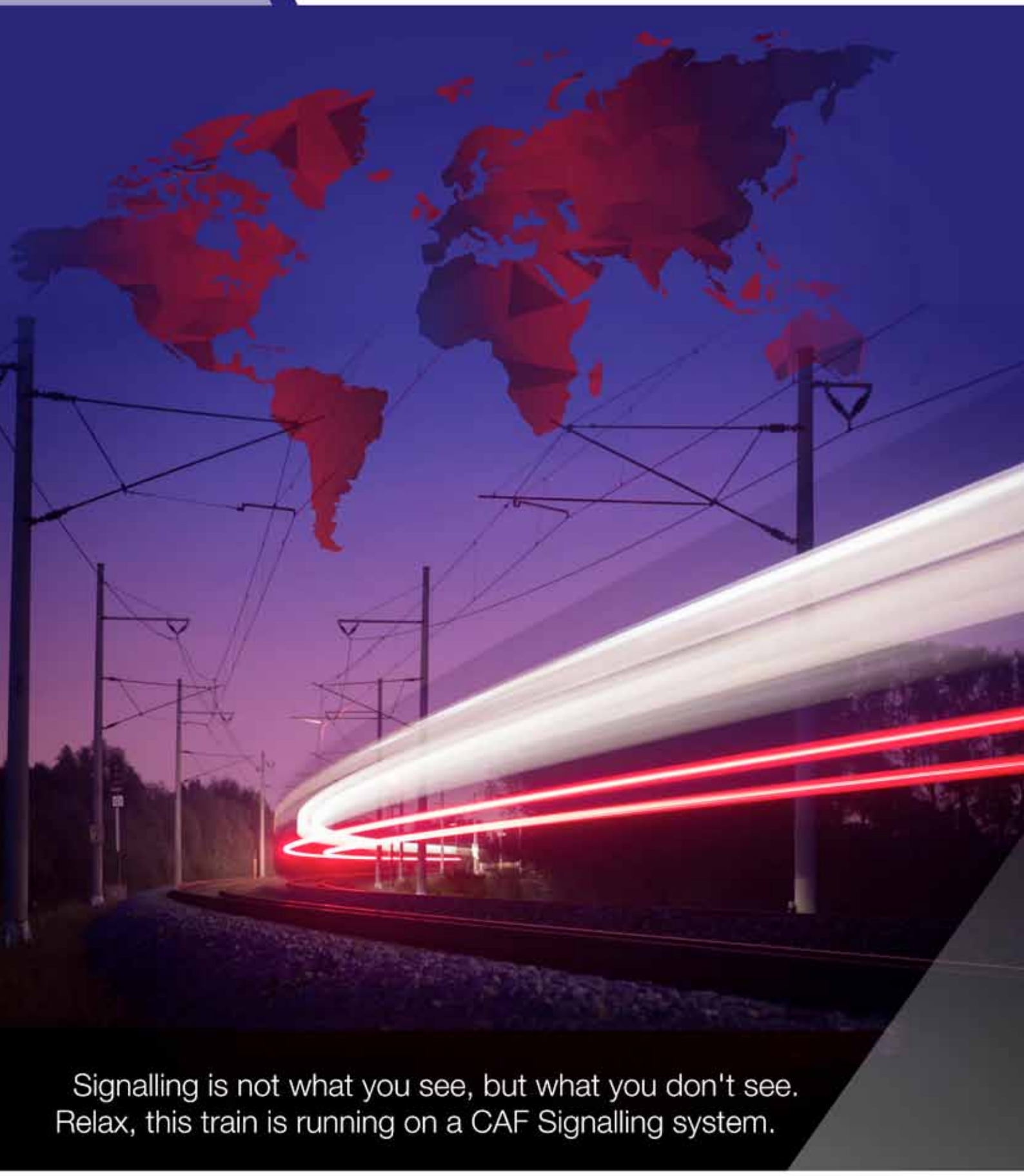
- **P: +34 96 141 50 00**
- **F: +34 96 141 50 02**
- **info@ve.vossloh.com**
- **www.vossloh-rail-vehicles.com**

The Vossloh España Engineering Center has a commitment to innovation.
State-of-the-art technology and optimum quality are the characteristics of the whole range of products developed and produced in the Valencia plant.
As one of Europe's leading rail industry manufacturers, we design and build locomotives as well as passenger trains.
Closely linked with the industrial heritage of railways and with the benefit of more than a century of experience, our goal is to design and manufacture advanced-technology, high-performance locomotives for present and future public transport networks, to create new passenger vehicle concepts and to provide comprehensive maintenance services.

CAF Signalling



Signalling is not what you see, but what you don't see.
Relax, this train is running on a CAF Signalling system.

www.cafsignalling.com