



16TH WORLD CONGRESS ON ENGINEERING ASSET MANAGEM

Value - Centered And Intelligent Asset  
Management In The 4th Industrial Revolution Era

October 5-7, 2022. Sevilla

[www.2022wceam.com](http://www.2022wceam.com)  
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*See you in Seville !!*



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# SPECIAL PLENARY SESSION

With 50 years' experience, Enagás is an international standard bearer in the development, operation and maintenance of gas infrastructures. It is accredited as an independent TSO by the European Union and carries out its activities in eight countries.

The special 16th WCEAM session we present today is an original idea of Claudio Rodriguez, General Manager of Infrastructures at Enagás. He wants to generate a dialogue and exchange of ideas on the topic of energy transition with key players in this field, top managers responsible for critical utilities and infrastructure in our country and with an important international projection. The gas, electricity, hydrocarbon, railway networks together with the port authority will be represented at this unique session.

Join us to explore the impact of advanced proposals for risk and life cycle management in this type of assets, which according to Claudio will be key elements for energy transition to be efficient in the short term and sustainable in the long term.



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# SPECIAL PLENARY SESSION

## THE ROLE OF ASSET MANAGEMENT IN THE CHALLENGES OF THE ENERGY TRANSITION

Rodríguez Suárez, Claudio  
Enagas, Spain

Access to sustainable energy is one of the major challenges facing society today. Several of the European Union's Sustainable Development Goals (SDG's) are directly related to access to clean and affordable energy. Thus, the use of existing infrastructures will be key to accelerate the integration of new energies in a fast and economically efficient way, guaranteeing the security of supply currently demonstrated by the electricity and gas systems. This "coupling" of gas and electricity would allow us great independence, which would make it possible to take advantage of the large storage capacity of the gas infrastructure, gaining access to renewable energy. It is in this scenario where asset management will play a key role, in order to maintain the current level of service, it is necessary to extend the life cycle, transform, expand and make compatible with new technologies where appropriate. Correct risk and life cycle management will be key elements for the transition to be efficient in the short term and sustainable in the long term

El acceso a una energía sostenible es uno de los grandes retos a los que se enfrenta la sociedad actual. Varios de los Objetivos de Desarrollo Sostenible de la Unión Europea están directamente relacionados con el acceso a una energía limpia y económicamente accesible. Así pues, la utilización de infraestructuras existentes va a ser clave para acelerar la integración de las nuevas energías de una forma rápida y económicamente eficiente, garantizando la seguridad de suministro que actualmente han demostrado el sistema eléctrico y gasista. Este "coupling" de gas y electricidad se traduciría en una mayor independencia, que permitiría aprovechar la gran capacidad de almacenamiento de la infraestructura gasista, accediendo a energía renovable. Es en este escenario donde la gestión de activos va a desempeñar un papel clave, pues para mantener el nivel de servicio actual, se necesita extender el ciclo de vida, transformar, ampliar y compatibilizar con nuevas tecnologías donde proceda. Así pues una correcta gestión del riesgo y del ciclo de vida, serán elementos clave para que la transición sea eficiente a corto plazo y sostenible en el largo.

Keywords: Sustainable Development Goals, Lifecycle, Sustainable Energy



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## SPECIAL PLENARY SESSION

Since 1942, Talgo is a leading company in the Spanish railway sector, with an international industrial presence and recognized worldwide for their innovative capacity, their technology, quality, reliability, and for the added value of their products and services.

This Talgo special 16th WCEAM 2022 session will be presented by Luis Alfonso Henar Perez, worldwide Talgo Maintenance Manager. Luis Alfonso and his team will tell us about the vicissitudes of the project, the work in collaboration with the other companies of the consortium, and the incredible experience lived during these years, until achieving a stable operation of the high-speed train on the Arabian peninsula.

Join us to learn about asset management in extreme conditions, with high temperature and permanent fight against the desert sand.





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# SPECIAL PLENARY SESSION

## THE DESERT HIGH-SPEED TRAIN

**Challenges and achievements of the Spanish Consortium that has made the Haramain (Mecca-Medina) TALGO High Speed Train a reality.**

Henar Pérez, Luis Alfonso

Talgo Global General Manager Maintenance

The Kingdom of Saudi Arabia, through the state-owned Saudi Railways Organization (SRO), began the construction, with public funding, of a 453-kilometer high-speed railway line between the cities of Mecca and Medina (the so-called Haramain High Speed Rail or HHR). In July 2010, the Spanish consortium Al Shoula Consortium was awarded the 6,736-million-euro macro-contract, the largest international contract won by Spanish companies until that time. This is a global project that includes from the construction of the line's platform, some 450 kilometers long, to the installation of its superstructure (signaling, electrification, tracks, telecommunications and safety systems), 35 high-speed trains + 1 VIP train, designed for speeds of more than 300 kilometers per hour, and the subsequent operation and maintenance of the trains and the corridor for 12 years.

Since the inauguration of commercial operation on October 11, 2018, until February 22, 2022 Haramain High Speed Railway's high-speed trains provided more than 14,833 commercial services for nearly 2,3 million passengers. The average punctuality percentage stood at a figure of over 95% on-time arrivals.

Central to this project are the TALGO trains themselves. Attend this interesting session to find out how technology made it possible for the TALGO trains to operate at very high temperatures and in a permanent struggle against the desert sand. We will consider everything from the design and manufacturing of the trains themselves to the design and functioning of TALGO maintenance sites to the set-up and manning of the maintenance operation and, we will pay special attention to our advanced predictive maintenance techniques.



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# SPECIAL PLENARY SESSION

Today I am pleased to announce the plenary session to be given at the 16th WCEAM 2022 in Sevilla by Professor John Andrews of the University of Nottingham.

To introduce the topic and to show the importance of these issues in modern infrastructure management, we are fortunate to have Esther Mateo Rodriguez, General Director of Safety, Processes and Systems at ADIF, the company responsible for the railway infrastructure management in Spain.

John's talk will focus on issues that can occur when generating models to support asset management strategic decisions on railways, and how to avoid them. It is a very interesting presentation where he will be using graphical models and practical examples, from different types of asset such as track and bridges, to illustrate the points.

This is a must-talk for those academics and analysts interested in this area of modeling, also for asset managers to see the potential of these tools





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# SPECIAL PLENARY SESSION

## MODELS TO SUPPORT ACCURATE DECISION MAKING IN RAILWAY INFRASTRUCTURE ASSET MANAGEMENT

Professor John Andrews



Professor of Infrastructure Asset Management  
Director of the Lloyd's Register Foundation  
Resilience Engineering Research Group  
University of Nottingham, UK

Mathematical modelling plays an important role in supporting decisions to develop effective maintenance and renewal strategies for infrastructure. Clearly, the better the quality of the models, then the more capable they are to enable the delivery of accurate decisions on what to do and when to do it.

This presentation looks at some of the issues around developing models capable of accurately representing the performance of different asset management strategies and offers some guidance on where problems can occur and how they can be avoided.

Practical examples will be used from the railway industry where the network infrastructure comprises of a complex and diverse collection of assets which include the track elements (rails, ballast, sleepers switches & crossings), civil structures (bridges, tunnels, earthworks) and systems (traction power, signalling and communication).



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## SPECIAL PLENARY SESSION

Founded by Michel Morvan and Hugues de Bantel in 2010, Cosmo Tech is a spin-off of ENS Lyon. We're honored to have Michel with us in October, to introduce Cosmo Tech and their solutions, considered a world reference in modeling, simulation, and optimization of industrial systems.

Cosmo Tech product strategy is based on the construction of digital twins, which makes them different from other competitors in the concept of product and offer to the market. The idea of the firm is to support, through digital twins, decision-making processes at a strategic level.

It offers the ability to virtually test customer action plans before they are implemented. The models are intended to help obtain an optimal and executable strategy and to be able to define an operational plan with full transparency. Its main clients are in the manufacturing, automotive, energy and transportation sectors.

Some important aspects of the Cosmo Tech solutions are related to their combination of simulation and ML from their inception. Their simulation digital twin solutions make this hybridization operational for the most complex industrial problems. The possibility to train reduced ML models from simulation results, or to explain through simulations those correlations detected by ML models, results in a very powerful hybrid modelling approach, that can exploit the strength of each digital technology. In fact, this hybrid approach emerges as a growing trend in the scientific community. Researchers at MIT, OpenAI and the Fraunhofer Center for Machine Learning are just some of the groups already exploring this path.

Join us in this very exciting session linking 4.0 technology to assets strategic planning.





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# SPECIAL PLENARY SESSION



## DIGITAL TWIN TECHNOLOGY FOR ASSET LIFECYCLE MANAGEMENT. COSMO TECH'S APPROACH.

Michel Morvan

Executive Chairman and Co-Founder at Cosmo Tech

Upheavals such as the pandemic, financial or political instability, demand volatility, climate change and energy transition create an increasingly unpredictable future. This is compounded by the complexity that global interconnection brings. This makes it difficult to manage the future of assets, whether in the manufacturing or energy utility sectors.

So how can companies enhance agility and resilience during these times of uncertainty and volatility?

End of 2021, Gartner released a report on "The Ongoing March Toward Intelligent Assets" and identified the creation of digital twins as a key milestone after "OT alignment" and "IT-OT integration" to achieve asset intelligence (intelligent assets are those that have fully accessible and compatible datasets that support lean, automated and end-to-end processes that simultaneously optimize operations, engineering, maintenance, planning and economic performance for current market conditions).

Cosmo Tech's Simulation Digital Twin Platform is helping asset-intensive companies rethink their asset strategy for maximum return. Our customers adopt a systemic approach that enables their asset managers to understand the impact of short-term decisions on long-term performance, and thus to make optimal decisions. They can balance costs, risk and performance over the lifecycle of an asset in order to maximize performance and value.



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## SPECIAL PLENARY SESSION

IKERLAN is a technological center providing competitive value to companies in two main areas:

- electronics, information, and communication technologies &
- energy and mechatronics.

Their unique cooperation model combines technology transfer activities, internal research, and training of highly qualified personnel.

Working in proximity with the business reality, they are a cooperative member of the MONDRAGON Corporation and the BRTA - Basque Research & Technology Alliance and they have a major cooperation network integrated by renowned European centers and universities.

For years, the Universidad de Sevilla and IKERLAN have established a strategic alliance for research cooperation around asset management, and I am very proud to count on them for this special session at WCEAM 2022.

We wanted to organize this session with a focus on manufacturing companies. We have asked IKERLAN to present their most advanced solutions within the area of data analytics, predictive models, prescriptive analysis, and digital twins, for this type of companies.

Join us to appreciate how these new strategies and solutions help when it comes to compiling the most meaningful and valuable information about the assets.





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# SPECIAL PLENARY SESSION

**ikerlan**

MEMBER OF BASQUE RESEARCH  
& TECHNOLOGY ALLIANCE

## **ASSET MANAGEMENT IN THE MANUFACTURING INDUSTRY: TECHNOLOGICAL SOLUTIONS AND INDUSTRIAL EXPERIENCES.**

Urko Leturiondo Zubizarreta  
Monitoring Team Leader at IKERLAN

The post Covid era comes with many sources of uncertainty that directly affect the manufacturing industry. Production downtimes due to supply chain disruptions, postponement or cancellation of investments in machinery, or high volatility in energy costs are just some of the problems that production managers need to deal with. This situation, along with increased sustainability requirements and a higher global competitiveness, makes proper asset management play an even more crucial role.

In this context, the development of technological solutions that aid decision making generates a high value to the business. Solutions covering from sensing and monitoring capabilities to data analytics, digital twins, predictive models, prescriptive analysis, and optimization strategies help when it comes to compiling the most meaningful information about the assets. In this plenary session, some of the solutions that are currently being developed will be presented, as well as some experiences on the application of these technologies in manufacturing companies.



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