PRESS RELEASE

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ARGOS INNOVATION PARTNERSHIP : SNCF RÉSEAU SELECTS THE THALES, ALSTOM AND HITACHI RAIL GROUPS FOR DEVELOPMENT OF ITS NEXT GENERATION SIGNAL INTERLOCKINGS

- **The ARGOS innovation partnership launched by SNCF Réseau in 2018 to develop and rollout a new generation of computer-controlled signal interlockings is about to graduate to the next stage.**
- **For 18 months, teams of industrial and SNCF Réseau engineers have been conducting research to find the technical solution best suited to SNCF Réseau's needs and targets.**
- **For the development phase now about to begin, SNCF Réseau will be pursuing its cooperation with the Thales, Alstom and Hitachi Rail groups.**

The ARGOS innovation partnership challenge

Computer-controlled interlockings are crucial to ensuring the safety of moving trains by controlling point and signal operations in their catchment area. Many existing interlocking boxes are old or their technologies obsolete and are therefore due for replacement. The ARGOS computer-controlled interlockings under development will enable these electro-mechanical, electrical or purely mechanical systems to be converted and upgraded to digital technology.

The ARGOS project targets high levels of technical and economic performance. By transmitting information in real time, incident response will be swifter, reducing the impact of failures and maintenance and improving traffic flows, with the attendant knock-on benefits for passengers. The solutions developed will obviate the need for intermediate relays, the resulting smaller footprint reducing the volume of ground-based infrastructure and cables and driving down installation and maintenance costs.

The benefits ultimately expected are as follows :

- a 15% decrease in installation and maintenance costs.
- a 30 % decrease in installation lead times: today, medium-sized interlocking boxes take 3 years to be commissioned. With ARGOS, this will be reduced to 2 years.
- improvement in overall performance with the new equipment, in particular with regard to cybersecurity, maintenance and operations.

For Anne-Sophie Naboulet-Larcher, Technological Strategy and Contract Award Manager at SNCF Réseau : *"Our goal is to roll out an efficient, resilient, easily maintainable system that can be installed and tested with minimum impact on traffic".*

The three contenders emerging from a successful partnership

It was in 2018 that SNCF Réseau embarked on ARGOS, its first multi-awardee partnership. At the end of an 18-month period devoted to research, the development phase now about to begin amply demonstrates the success achieved so far by all the teams involved.

The Thales - ENGIE Solutions - Vossloh group, the company Alstom, and the Hitachi Rail - Eiffage Énergie Systèmes - SYSTRA group have now each been tasked with upgrading an existing installation and developing pre-series production interlockings, the first of which are scheduled for commissioning at end 2023.

A total of 150 experts contributed to the research phase: 35 at SNCF Réseau and 115 at its industrial partners. By deploying such extensive resources, it has been possible to conduct the project to time despite the current health crisis.

For SNCF Réseau, the partnership is a long-term commitment. At the end of the 30-month development period, infrastructure manager and industry will remain bound by a 15-year rollout contract, the purpose of which is to achieve sustainable and durable industrial excellence.

THE THALES, ENGIE SOLUTIONS, VOSSLOH GROUP

In the spirit of the ARGOS innovation partnership, the Thales-ENGIE Solutions-Vossloh group, which emerged victorious from the competition, is determined to work alongside SNCF Réseau at all stages of the change management process. As group leader, Thales is in charge of project management, system development and delivery. ENGIE Solutions is responsible for research, projects, technical inspections and compliance checks and Vossloh Cogifer for parameterisation, additional and functional tests. The technical solution proposed by Thales won plaudits for its particularly modular and innovative design. In the rollout phase, the Thales-ENGIE Solutions-Vossloh group is to produce a first production interlocking unit for the Auvergne-Rhône-Alpes region, initially focusing more particularly on the Lyon-Vienne corridor.

For SNCF Réseau, the ARGOS project not only targets new system development but is also synonymous with new implementation techniques, based on digital continuity and automation of a number of operations. To achieve this, various innovative tools are to be specially designed for this large-scale project. With the support of its civil engineering consultant SETEC, the Thales-led group has successfully come up with several original proposals with regard to research and rollout that promise to drive down installation lead times by 30%. One of today's biggest challenges is change management and here the group will be joining forces with SNCF Réseau to maintain the same spirit of partnership that has hallmarked the research period.

"We are proud that the first solution chosen by SNCF Réseau for developing its "high-performance network" is that proposed by the Thales-ENGIE Solutions–Vossloh group for a new generation of computer-controlled interlockings making even greater use of digital technologies. It was 20 years ago that Thales began delivering computerised signalling systems and, over the years, it has built up a strong, trust-based relationship with SNCF Réseau, partnering it in the move towards converting the SNCF network to digital technologies," **Yves Joannic, Vice-President Main Line Signalling, Thales.**

THE COMPANY ALSTOM

The planned evolvement of the interlocking technology has been developed by Alstom as part of the planned transformation of the French rail network infrastructure and the Regional Command Centre program. The new interlocking generation will allow a reduction of 15% of the total cost of ownership for the operator. Through a resilient and performant system, the interlocking will be 30% quicker to deploy than previous generations. While assuring the digital continuity of the product, special focus has been laid on cybersecurity.

Alstoms Smartlock interlocking family benefits from 30 years of worldwide experience. It is suited for all railway topologies with a centralised or distributed architecture and is applicable for both new and existing installations. The technology offers very high reliability and operational functionality, maximising safety and punctuality. Smartlock allows an easy and fast adaptation to future changes in network traffic considerably reducing implementation times in the network. The Montbard installations, spanning 30 kilometers between Paris - Dijon, including the connection to the South-East high-speed line, have been selected as the pilot to enable Alstom to deploy its solution in partnership with SNCF Réseau team from Dijon.

"I am proud that we confirm our leading position in interlocking technology with this project. With railway systems becoming ever more complex, railway operators need a system that they can count on to guarantee the performance and availability of their system. We thank SNCF Réseau for their trust in our innovation management and together to be able to bring interlocking technology to a new standard," **says Jean-Baptiste Eyméoud, President Alstom in France.**

THE HITACHI RAIL, EIFFAGE ÉNERGIE SYSTÈMES, SYSTRA GROUP

The solution selected by SNCF Réseau and developed by the Hitachi Rail, Eiffage Énergie Systèmes and SYSTRA group is the culmination of the joint efforts of companies that have earned worldwide recognition for their skills in all branches of railway industry and for their substantial local production capacity.

Group leader, Hitachi Rail, is responsible for system development, parameterisation and delivery, Eiffage Énergie Systèmes for work on signalling and SYSTRA for design studies, interlocking study verification, technical inspections and compliance checks.

The new generation interlockings represent a major breakthrough achieved through the best possible technological combination to meet SNCF Réseau's performance, cost reduction and timeline targets. The technical solution proposed is particularly well-adapted to local or centralised rail network operation. System resilience is enhanced by means of geographical redundancy and cybersecurity considerations built in from the design phase. The approach developed is modular and will lessen the amount of cabling needed, since the system will be able

to interface directly with trackside objects such as switches and signals, etc. Its compact enclosures will slot easily into existing SNCF Réseau facilities in the field. Even the methods proposed are innovative, these being based on automation and digital continuity for better quality design processes and interlocking rollout times cut by 30%.
The Hitachi Rail, Eiffage Énergie Systèmes and SYSTRA group will be responsible for preproduction interlockings to control the signal box at Arzwiller and the automatic block signalling section between Réding and Saverne in the Grand Est region.

"The Hitachi Rail, Eiffage Énergie Systèmes and SYSTRA group is highly appreciative of the further display of confidence demonstrated by SNCF Réseau through the award of this ARGOS contract. The two years that we have spent working with SNCF Réseau and its engineers in this innovation partnership and the long-standing relations between SNCF Réseau and the members of our group have enabled us to pool our experience and tap into a wide range of skills in jointly developing the specifications and architecture for the new generation signal interlockings.

The contract that has been awarded is a tribute to the skills and efforts of the men and women who played a part in ensuring the success of the first part of the project and will enable us to further pursue our work on designing and developing the innovative solutions crucial to transforming tomorrow's railway infrastructure," **Gilles Pascault – Chairman of the Board of Hitachi Rail STS France.**

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About SNCF Réseau
To cater to growing demand for mobility and for the opening of the passenger transport market, SNCF Réseau develops rail services on the 30,000 km of line that it is tasked with maintaining and upgrading and for guaranteeing operating safety. SNCF Réseau works in partnership with the central and regional authorities to provide fair and equal access to the rail network and its infrastructure for the train operators and organising authorities that are its principal clients. It boasts a 53,000 strong workforce and, in 2019, had a turnover of €6.5 billion. www.sncf-reseau.com

About Thales
Thales (Euronext Paris: HO) is a global technology leader shaping the world of tomorrow today. The Group provides solutions, services and products to customers in the aeronautics, space, transport, digital identity & security and defence markets. With 83,000 employees in 68 countries, Thales generated sales of €19 billion in 2019 (figures including Gemalto over 12 months).
Thales is investing in particular in digital innovation — connectivity, Big Data, artificial intelligence and cybersecurity — technologies that support businesses, organisations and governments in their decisive moments. www.thalesgroup.com

About ENGIE Solutions
ENGIE Solutions supports towns, industries and companies in the tertiary sector, providing them with solutions to the challenges posed by the energy transition in the form of turnkey and bespoke packages. ENGIE Solutions' experts apply all their expertise in pursuit of three aims: optimizing the use of energy and resources, greening energies and reinventing living and working environments.
ENGIE Solutions guarantees its clients a single point of contact and a combination of complementary offerings that go beyond energy. The company is committed to achieving results and its 50,000 employees which operate throughout France (900 sites) have expertise in an extremely diverse number of areas, ranging from the design and operation of infrastructure & services, to funding, installation and maintenance.
Engie Solutions is part of the ENGIE Group, one of the world's leading low-carbon energy and services groups whose aim is to become the leader in the zero-carbon transition. Turnover: €10 billion. To find out more, visit www.engie-solutions.com

About Vossloh
Vossloh is a technologically leading Group in the field of rail infrastructure with a core focus on rail infrastructure. We provide our customers around the world with integrated railway solutions. The group products and services for rail infrastructure and includes three business units: Core Components, Customized Modules and Lifecycle Solutions. In the 2019 fiscal year, Vossloh achieved sales of €916.4 million with approximately 3,786 employees. The company Vossloh Cogifer (Customized Modules Division) is one of the world's leading manufacturers of switch systems. With numerous production locations in over 20 countries, Vossloh products include switch actuators and locking devices, signaling products, manganese frogs, switch points and rail monitoring systems. Vossloh's products cover all applications, including standard, high-speed, special and heavy haul switches manufactured in accordance with all international standards, as well as solutions for urban networks.

About Alstom
Leading the way to greener and smarter mobility worldwide, Alstom develops and markets integrated systems to provide sustainable foundations for tomorrow's transport. It offers a complete range of equipment and services, from high-speed trains, metros, trams and e-buses to integrated systems, customised services, infrastructure, signalling and digital mobility solutions. The company recorded sales of €8.2 billion and booked orders of €9.9 billion in the 2019/20 fiscal year. Headquartered in France, Alstom is present in over 60 countries and currently employs 38,900 people. Its around 9,500-strong workforce in France possess a range of skills and abilities that they use to serve their national and international clients. Its activities also have the knock-on effect of creating more than 25,000 jobs among its 4,500 French suppliers. www.alstom.com

About Hitachi Rail
Hitachi Rail is an international group providing turnkey mobility solutions that include rolling stock, signalling equipment, operating systems, maintenance and the corresponding digital technologies.
The Hitachi Rail group is strongly represented in France. Its headquarters are in Europe and it is one of SNCF's historic suppliers for signalling systems, interlocking boxes in particular. For the ARGOS project, Hitachi Rail has been working in association with Eiffage Énergie Systèmes and SYSTRA.
www.hitachirail.com

SYSTRA is one of the world's leading engineering and consultancy groups specialising in public transport and mobility solutions. For more than 60 years, the Group has been committed to helping cities and regions to contribute to their development by creating, improving and modernising their transport infrastructures. www.systra.com

Eiffage Énergie Systèmes designs, develops, operates and maintains user and environment-friendly electrical engineering, industrial engineering, HVAC and energy systems.
Eiffage Énergie Systèmes has acquired major rail sector skills and competencies, especially in respect of research and implementation of railway signalling systems for SNCF, metros, trams and HSL. Since 2009 Eiffage Énergie Systèmes has been involved in more than 35 computer-controlled interlocking (SEI 2006) upgrading operations. www.eiffageenergiesystemes.com