

ARIES

The Future of Rail Simulation



Atos

The introduction of digital Control, Command and Signalling (CCS) has presented significant challenges in the rail industry. Implementations of CCS systems are complex, expensive and cumbersome transitions, which demand interoperability and integration of many highly configurable safety-critical systems.

Throughout the design and deployment life cycle, this challenge has mandated the need for accurate simulation that is key to the verification, validation and optimisation of these future systems.

Atos's Advanced Rail Intelligent Environment Simulation (ARIES) is a groundbreaking rail modelling and simulation platform that allows engineers to efficiently test, de-risk and optimise CCS systems in a controlled virtual environment before physical deployment. For over a decade, ARIES has played a pivotal role in supporting rail operations to be more efficient, adaptable and future-ready by empowering users to digitally tackle complex rail challenges.

Key features of ARIES



High-fidelity microscopic simulation

ARIES accurately replicates real-world train movements, factoring in physics such as train acceleration and braking, gradients and track adhesion on a second-by-second basis.



Operational analysis

It can be used for network capacity measurement, timetable optimisation, degraded mode assessment, disruption and perturbation modelling, enhancing operational analysis and efficiency while highlighting key measurements of network resilience and recovery performance.



Design validation and optimisation

Designed for precision and innovation, ARIES is a critical enabler in the validation of CCS system design. It facilitates the automated and iterative checking and validation of the scheme design throughout project development. This enables early detection of design and safety issues, and efficiently provides resolution options.



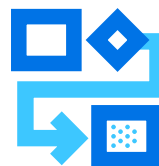
Rapid innovation for research and development

Designed for swift innovation, ARIES accommodates exploration and comparison of new technologies while ensuring adaptable responses to evolving challenges with continuous understanding and learning capabilities.



Human factors and visualisation

Providing a simulation in a virtual 3D world allows validation of human factors and risk assessment by allowing an accurate modelling of new infrastructure design and new digital technologies that highlight the changes to driver workloads, degraded mode operations and disruption scenarios.



Component architecture and interoperability

ARIES employs a flexible component-based structure, enabling the seamless integration of third-party systems such as Traffic Management System (TMS) or signalling control systems for realistic assessments. Standard and custom APIs are employed to enable synchronization for testing and training purposes.

The ARIES advantage

Best-in-market solution: Highly accurate simulation with market-leading functionality and interoperability

Rapid model creation: Quick and accurate model creation by amalgamating diverse data with comprehensive data validation tools

Detailed modelling analysis: A collaborative and staged approach to results reporting with early insights to inform subsequent analysis and refined understanding for more targeted outcomes

Tailor-made functionality: Highly valued, Agile approach to project work. Atos can add custom functionality to ARIES based on your specific needs..

Compatibility: ARIES has a proven range of compatibility with existing models, including RailSys, Network Rail open data feeds, SDEF and RailML, facilitating efficient project initiation. Custom imports and exports are also available.



Tangible benefits

Using the ARIES simulation platform and leveraging Atos's expert teams' deep rail domain knowledge, the solution delivers the following results.

- **Faster design process** by identifying issues early in the design
- **Rapid optioneering** and **optimisation** of change by enabling comparative analysis
- **Enhanced safety** through rigorous and comprehensive testing
- **Reduced risk** by spotting issues in the design phase rather than in build or live operation
- **Improved future network performance and resilience** by enabling analysis of abnormal scenarios and recovery options



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Get in touch with our expert for a demonstration of our product and a detailed discussion on how our services can meet your needs.

About Atos

Atos Group is a global leader in digital transformation with c. 56,000 employees and annual revenue of c. €7.2 billion (at the go-forward perimeter), operating in 54 countries under two brands - Atos for services and Eviden for products and systems. European number one in cybersecurity and a leader in cloud, Atos Group is committed to a secure and decarbonized future and provides tailored AI-powered, end-to-end solutions for all industries. Atos Group is listed on Euronext Paris.

Find out more about us
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Let's start a discussion together



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