Rail Services
Reliability, Availability, Maintainability and Safety (RAMS)

The objective of a railway system is to always achieve a certain level of traffic, operate safely and under the cost established limits, avoiding loss of value. The application of the RAMS process in railway systems makes possible to determine the confidence with which this objective can be achieved. The RAMS values determine the safety and quality level the railways service is offered to the customer, considering relevant factors as the functionality and performance.

RAMS parameters are long-term exploitation characteristics of the railways system and are achieved through the application of established engineering concepts, methods, tools and techniques throughout the life cycle of the system. RAMS parameters depend on the qualitative and quantitative characteristics of the subsystems and components that integrate the complete system. RAMS values determine the dependability of a system and are given by the combination of interrelated characteristics related to reliability, availability, maintainability and safety.

RAMS CENELEC standards and Regulation No. 402/2013 Common Safety Method for Risk Assessment and Evaluation, establish the requirements to be fulfilled by railway subsystems and components. RAMS safety standards establish the safety process to be applied for new developments or modifications of railway subsystems.

OUR SOLUTION

SGS is a well-recognized entity in the railway market, supporting their clients to fulfill RAMS requirements of their projects.

At SGS, we combine a deep competence in RAMS together with the specific expertise for each railway subsystem: Rolling Stock. Control-Command and Signalling Systems, Energy and Infrastructure.

We implement the RAMS safety process performing systematic analyses on the system to determine those adverse conditions, hazards, that may appear throughout the project life cycle. Losses may relate to human, property and/or environmental damage.

- **PRA** Preliminary Risk Analysis
- **HAZOP** Operational Hazard Analysis
- **FMECA** Failure Modes, Effects and Criticality Analysis
- **FTA** Fault Tree Analysis
- **RAM** Availability Studies.
- **Functional Safety**
- **SIL** Safety Integrity Level Assignment and Demonstration
- **Hazard Log** Risk Management and Register
- **V&V** Verification and Validation Process
- **Safety Case** RAMS Safety Process Demonstration

We have extensive experience implementing RAMS safety process into railways systems, products and processes. railway application projects according to CENELEC standards and regulations:

EN 50126-1. RAILWAY APPLICATIONS.
The specification and demonstration of reliability, availability, maintainability and safety (RAMS).

EN 50126-2. RAILWAY APPLICATIONS
The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) – Part 2: Systems Approach to Safety

EN 50128. RAILWAY APPLICATIONS.
Communications, signalling and processing systems, Software for railway control and protection systems.

EN 50129. RAILWAY APPLICATIONS
Communication, signalling and processing systems – Safety related electronic systems for signalling

EN 50657: RAILWAY APPLICATIONS
Rolling stock applications - Software on Board Rolling Stock

REGULATION (EU) NO 402/2013
The Common Safety method for Risk Evaluation and Assessment

SAFER GREENER SMARTER

WHEN YOU NEED TO BE SURE

SGS

The world's leading testing, inspection and certification company

SGS has a network of more than 2.650 offices and laboratories worldwide, with more than 98.000 employees. SGS offers you a complete portfolio of railways services:

SGS RAILWAY SERVICES

- Railways Technical Certification – NOBO / DEBO Conformity assessment body
- Railways Safety Certification – ISA / ASBO Independent safety assessment body
- RAMS Safety Management
- Testing & Inspection
- Welding Services – EN 15085 Certification
- Manufacturing - Supply Chain Quality Services
- Cybersecurity

CONTACT US

If you wish to know more about our services or how to get started, please do not hesitate to get in touch.

global.rail@sgs.com
www.sgs.com/rail

**SAFER
GREENER
SMARTER**

WHEN YOU NEED TO BE SURE

SGS