



Rail Services

Overview

SAFER
GREENER
SMARTER

SGS

SGS at a glance



N°1

World leader



98 000

Employees



2 650

Offices and
laboratories



7

Focus areas



**Global Service
Local Expertise**

Next stop, success!

SGS is well-recognized in the railway industry for supporting our clients to complete their railway projects with excellence, both at system and component level.

We combine our many years of experience with strong competence in quality and safety processes, and the specific expertise required in each subsystem:



Rolling Stock



**Control-Command &
Signalling Systems**



**Energy &
Infrastructure**

Our broad range of services will help you deliver projects and to ensure the continued performance of your business. We support you and we collaborate in your development, and the challenges you face, all the way from project conception to maintenance and operation. Whatever your needs.

SGS – When you need to be sure.



Our services cover your full project life cycle





Service Categories



Certification & Assessment

- Technical Conformity Assessment NoBo – DeBo EN 17065
- Independent Safety Assessment ISA – ASBO EN 17020
- Welding Certification EN 15085
- Quality System Certification (IRIS – ECM)
- Pressure Equipment Certification 2014/68/EU
- Machines Certification 2014/30/EU



Technical Assistance

- Project Management
- Technical Assistance
- RAMS Safety Process
- Verification & Validation Process
- Test in Laboratory
- Training



Inspection & Quality Control

- Supply chain - Suppliers Quality Audits
- Shop Inspection
- Testing on site
- Commissioning
- Asset condition and RAMS performance monitoring
- Expediting

How can we help you?



	Independent Safety Assessment	Technical Conformity Assessment	RAMS & Technical Assistance	Supply Chain Testing & QA/QC	Quality & HSE Process & Audits
Administrators and Operators	✓	✓	✓	✓	✓
Rolling Stock Manufacturers	✓	✓	✓	✓	✓
Entities in Charge of Maintenance				✓	✓
Signalling and Control Industry	✓	✓	✓	✓	✓
Infrastructure & Energy Industry	✓	✓	✓	✓	✓
Investors & Leasing Companies			✓		✓

Operators



OEM



Components





Conception, Engineering & Design

SGS



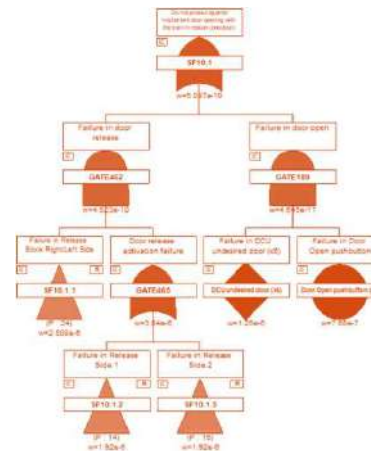
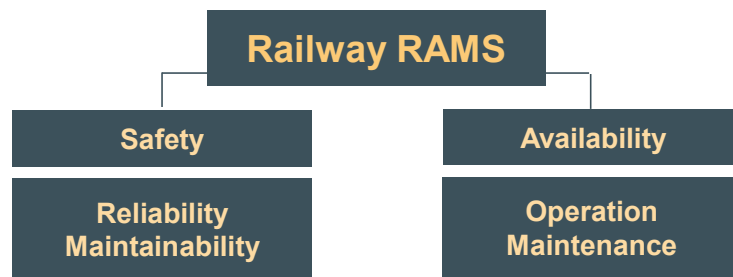
Project Management & Design Review



- Project management and project monitoring
- Procurement and implementation support
- Materials & Functional Testing
- Feasibility and location studies. Integration into existing systems
- Design review / independent checking engineer (ICE)
- Geotechnical engineering and soil mechanics.
- Foundation engineering
- Installations and structural studies
- Regulation and requirements management
- Time schedule for construction works, pricing and budgeting
- Occupational health and safety studies
- Quality control and inspection programs

Reliability, Availability, Maintainability & Safety (RAMS)

The application of the **RAMS Safety Process** according to **CENELEC** standards implies the correct performance of certain safety and quality activities in each of the phases throughout the Life Cycle, the evidence is collected and presented in the Safety Cases for subsequent ISA Evaluation.



Frequency	Frequency	Consequence			
		Undesirable	Minor	Major	Catastrophic
8	Frequent More than once in 6 weeks	Undesirable	Minor	Major	Catastrophic
7	Probable More than once between 6 weeks and 1 year	Tolerable	Undesirable	Major	Catastrophic
6	Occasional Less than 1 every 10 years	Tolerable	Undesirable	Major	Catastrophic
5	Rare Less than 1 between 10 and 100 years	Negligible	Tolerable	Major	Catastrophic
4	Unlikely Less than 1 between 100 and 1000 years	Negligible	Negligible	Major	Catastrophic
3	Very unlikely Less than 1 between 1000 and 10000 years	Negligible	Negligible	Major	Catastrophic
2	Extremely unlikely Less than 1 every 10000 years	Negligible	Negligible	Major	Catastrophic
1	Practically impossible Less than 1 every 100000 years	Negligible	Negligible	Major	Catastrophic
		I	II	III	IV



OT (Cyber) Security Assurance

Strategy - Assuring OT strategy and cyber risk management

- Support in design of OT roadmap, policy & governance
- Bridging divide between ICS (Automation, Eng, Operations) and IT
- Integration with European signalling requirements (with SGS Rail NoBo)

CAPEX - Safety built into the design

- Advising on international and local security regulation
- Standards assessment to ISO 62443, CIS Controls, NIST CSF, etc.
- Support for ICS/OT security roadmap/risk in alignment with safety/reliability requirements (e.g. bowtie/hazop/ etc.)
- Alignment to IT security and Industrial network & security architecture review and validation

OPEX - Safety delivered into the operation

- Implementation of solutions to support safe, reliable operations of industrial network equipment (incl installation supervision and technology deployment supervision and management)
- Outsourcing of industrial systems administration and management
- Continuous review and upgrade & assurance





Technical assessment and independent certification



Notified Body (NoBo) for European Technical Specifications for Interoperability (TSI)

- Mandatory for rolling stock and interoperability constituents to be operated on the European railway network.

Designated Body (DeBo) for Notified National Technical Rules

- Mandatory for rolling stock and interoperability constituents to be operated in a particular country. NNTRs are country-specific.

Assessment Body (AsBo) for Common Safety Method for Risk Assessment (CSM-RA)

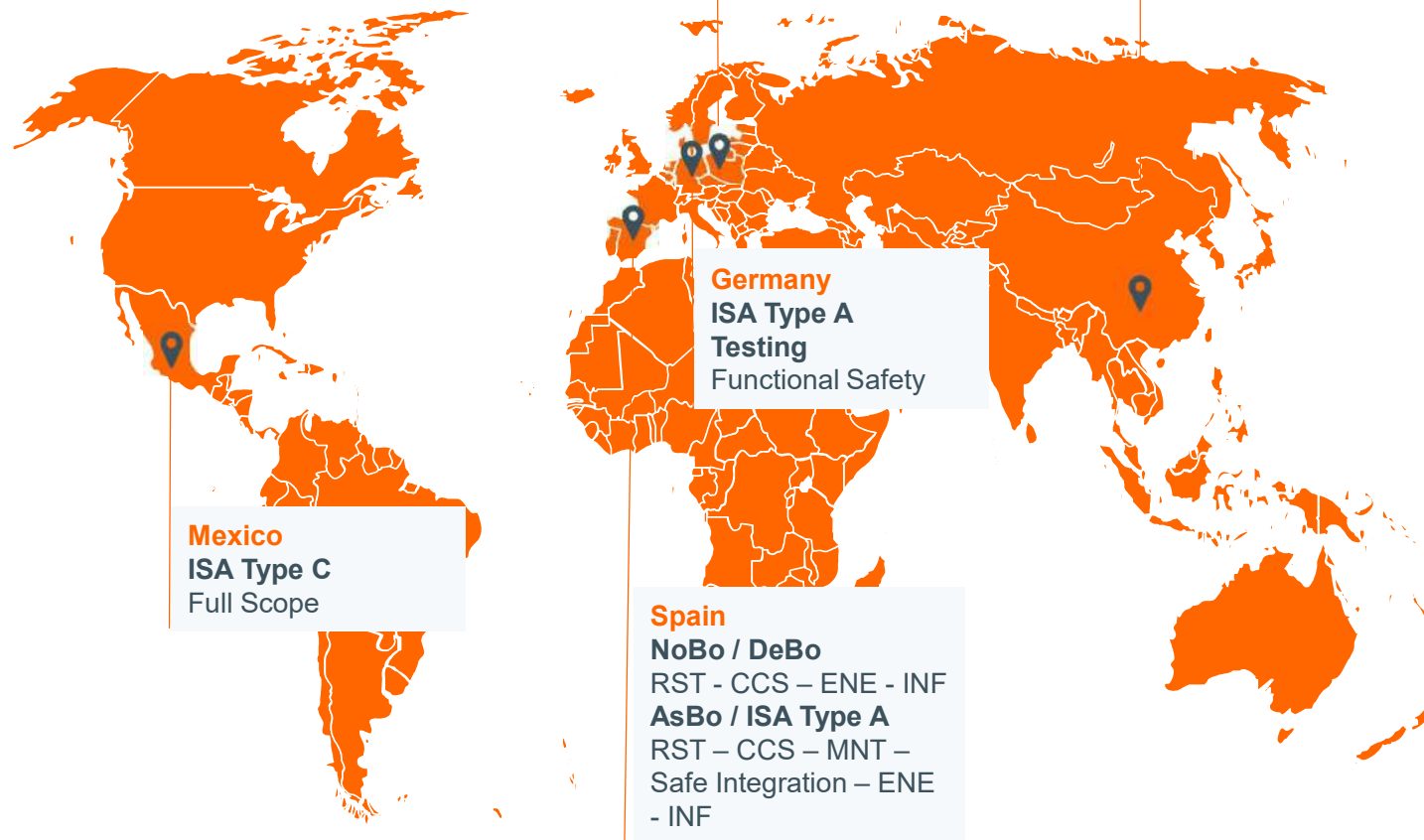
- Mandatory assessment for rolling stock and safety-critical components to be operated on the European railway network.

Independent Safety Assessor (ISA)

- Required for projects where the infrastructure and entire traffic management system is assessed, plus safety-critical components such as onboard command and control systems. Assessment against EN 50126, EN 50128, EN 50129 standards.



Our Scope



ALSTOM

1997 to 2001

CORREL
Rail Limited

2001 to 2011

SGS

2011.....

SGS

Our Accreditaions

Notified Body (NoBo)

- European Scope, services performed throughout EU
- N° 181/C-PR394 Rev./Ed. 4
- TSI (TSI RST, TSI WAG, TSI NOI, TSI ENE, TSI INF, TSI SRT, TSI PRM)
- CCS On-board

Designated Body (DeBo)

- National scope applicable to each Member State
- N° 181/C-PR394 Rev./Ed. 4
- RST (IF, ETH, ETM)
- CCS On-board

Assessment Body (AsBo)

- European scope
- N° 133/EI755 Rev./Ed.4
- RST, CCS, ENE, INF, MNT and Safe Integration

Independent Safety Assessment (ISA)

- Focused on EN5012x standards
- N° 133/EI755 Rev./Ed. 4
- RST, CCS, ENE, INF, MNT and Safe Integration










Manufacturing & Procurement

SGS

Our Solutions in Rail OEMs & Supply Chain



 Inspections/ technical assistance	<p>For both new builds and maintenance phases:</p> <ul style="list-style-type: none"> Shop inspections and expediting (spot and resident) Non-destructive testing of wheels, axles, bogies, couplers etc Vehicle condition assessments, analysing of fuels /oils/lubricants and cyber safety Construction supervision and safety management 	OEM Depot
 Design and safety Assessments	<ul style="list-style-type: none"> Notified Body (NoBo) for European Technical Specifications for Interoperability (TSI): rolling stock, infrastructure, other subsystems Designated Body (DeBo) for the Notified National Technical Rules – country specific Assessment Body (AsBo) for the Common Safety Method for risk assessment (CSM-RA) Independent Safety Assessor (ISA): safety-critical components EN 50126, EN 50128, EN 50129 standards 	OEM Manufacturers Depots
 Material/components testing	<ul style="list-style-type: none"> Mechanical testing; Failure and damage analysis Environmental and corrosion testing Testing of polymer and composite materials Reliability testing of electrical and electronic equipment Functional safety; Fire safety & Flammability testing 	OEM Manufacturers Depots
 Technical supplier assistance	<p>Secure and develop a reliable supplier base for long term partnership:</p> <ul style="list-style-type: none"> Supplier Qualification and development New part introduction, development and validation Engage and Optimize Existing suppliers Capacity, Capability and Margin Improvements 	Manufacturers
 Sustainability services	<ul style="list-style-type: none"> Carbon Management (Energy Audits, Carbon Reduction/Net-Zero Strategies, Setting SBTIs, etc.) GHG Verification (Verification of Mandatory and Voluntary reporting activities, Carbon Neutrality, Product Foot print, etc.) Circular Economy (Product Life Cycle Assessments, Waste audits and baseline/target setting for waste streams, etc.) EHS audits and industrial hygiene inspections for plants and facilities 	OEM Manufacturers Depots

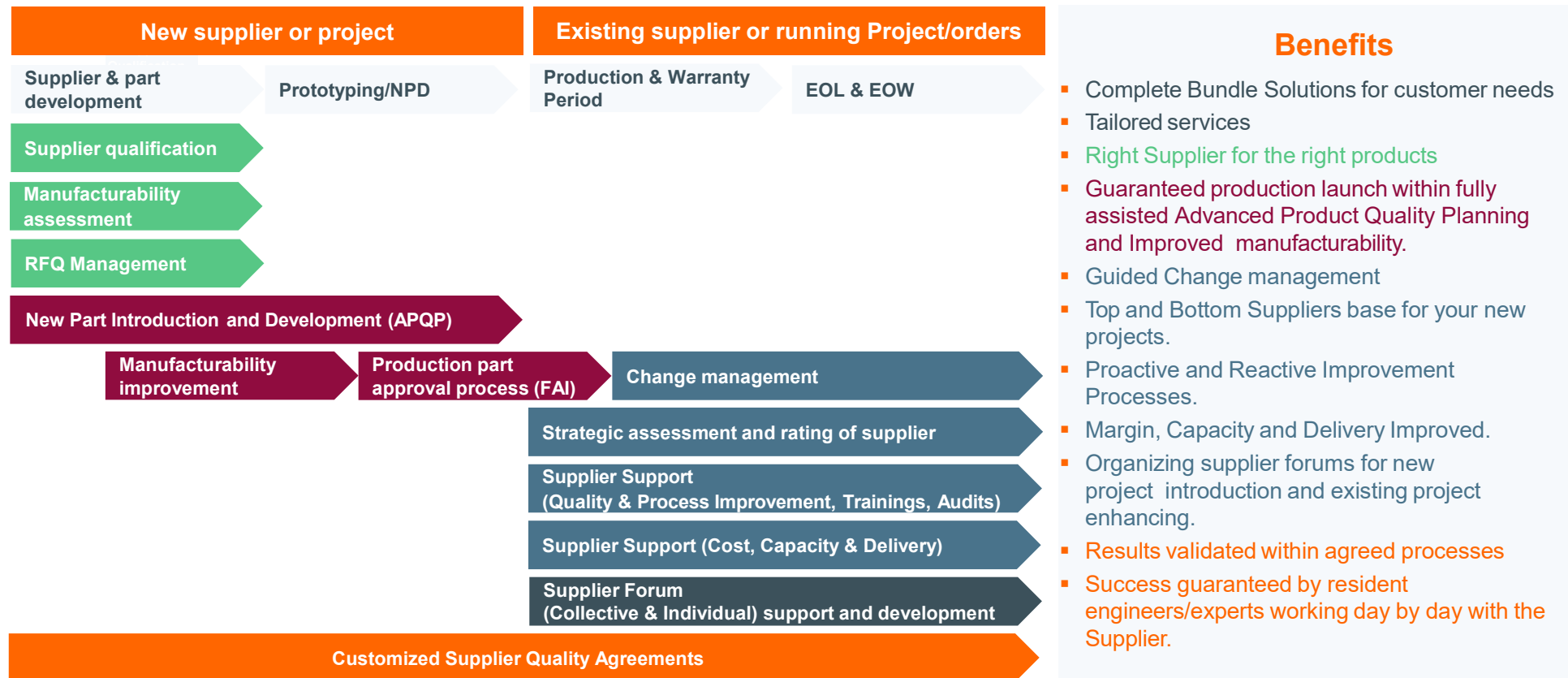


Supply Chain Assurance



Advanced Supplier Management

Support to secure and develop an optimal supplier base





Installation, Test & Commissioning

SGS

Installed Assets operational assurance



CONSULTING

Asset Integrity

- Asset Integrity Management (AIM)
- Risk Based Inspection (RBI)
- Shutdown preparation
- Design of inspection plans/programs
- Inspection department organization
- Failure analysis
- Corrosion Study Assessment

Asset Performance

- Reliability Study & Operational Excellence
- Energy Efficiency
- Sustainability consulting
- Metering and Calibration Solutions
- Supervision of improvement implementation
- Implementation support
- Experts on demand
- Lean

Asset Safety & Reliability

- Hazard & Operability Study (HAZOP)
- Hazard Identification Study (HAZID)
- Machine Safety
- HSE Audits

Ad hoc Solutions

- Program management
- Set-up of teams

INSPECTION & MONITORING

In-service

- Asset Integrity Inspection
- Statutory Inspection
- Structure Integrity Monitoring & Assessment
- Asset Performance Monitoring
- Vibration Monitoring
- Oil Condition Monitoring
- IR Thermography Assessment
- Emission monitoring
- Full inspection and NDT solution for Piping, Pipelines, Heat Exchangers, Storage Tanks

Works

- Supervision of maintenance works
- Vendor inspection
- Metrology

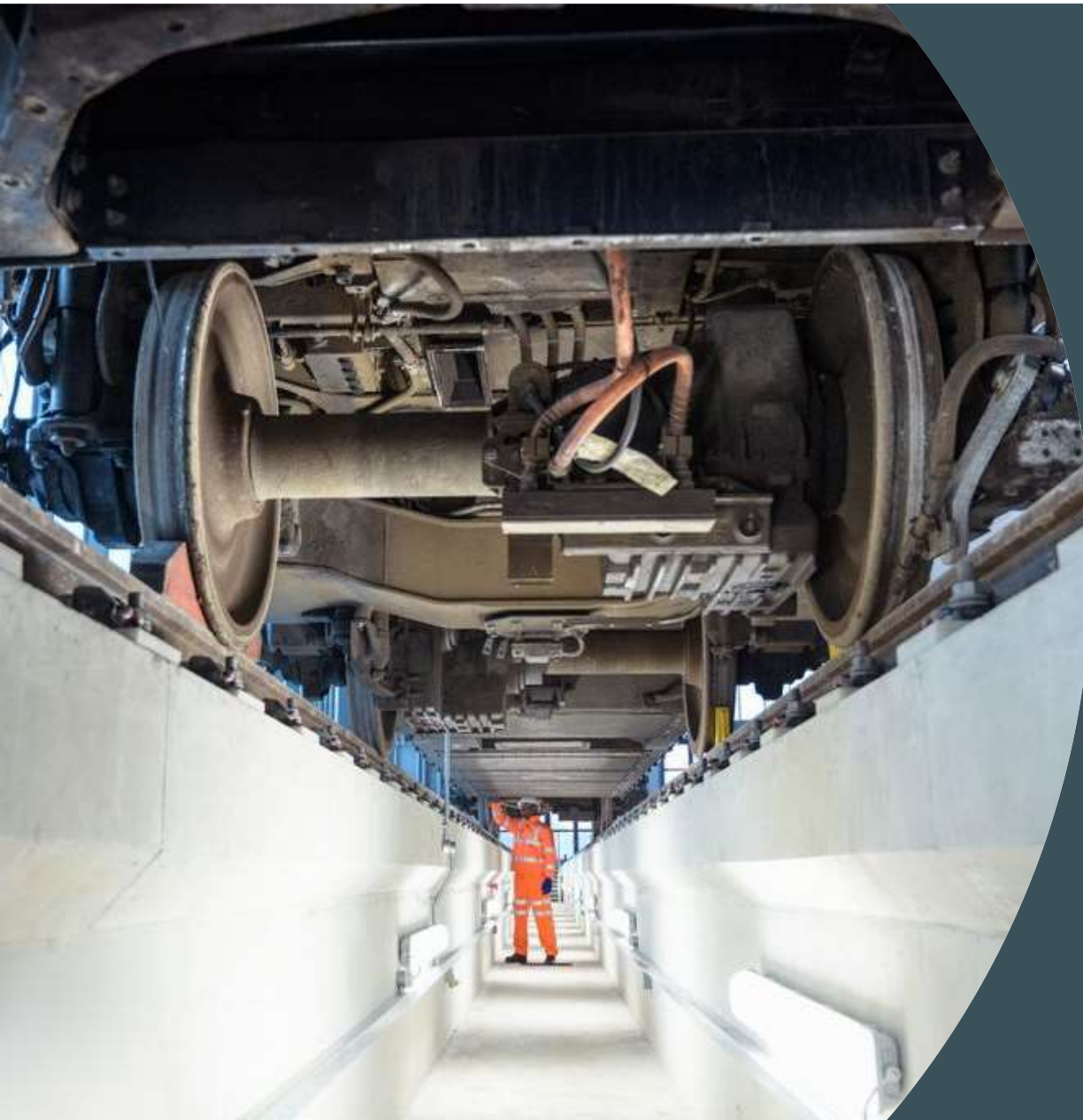
NON-DESTRUCTIVE TESTING

Conventional NDT

- Ultrasonic Testing (UT)
- Radiographic Testing (RT)
- Magnetic Particle Testing (MT)
- Penetrant Test (PT)

Advanced NDT

- Time of Flight Diffraction (ToFD)
- Phased Array Ultrasonic Testing (PAUT)
- Automatic Rapid Motion Corrosion Scanner (RMS)
- Tank Floor Magnetic Flux Leakage (MFL)
- Guided Wave (LRUT)
- Corrosion Under Pipe Support (CUPS)
- Pulse Eddy Current (PEC)
- Acoustic Emission Testing (AET)
- Tube Testing (IRIS, ECT, RFET, MFL, APR)
- Etc.



Operation & Maintenance





Testing & Monitoring



World-leading testing services tailored for the rail industry

- We help you to ensure the integrity of parts and assets of your fleet
- Detect defects and irregularities in parts and components before they result in damaged or non-compliance
- Ensure safe and reliable operation of your fleet

Standard Tests

- Static
- Fatigue

Track Test

- Dynamic & structural monitoring

Monitoring

- Operation behavior

NDT

- Static
- Welding
- Ultrasonic
- Radiographic
- Magnet particle

Evaluate the adequacy of maintenance activities

Input: review and audit

- Asset condition
- Monitoring
- Fleet maintenance registers: preventive and corrective
- Maintenance process, depots and resources evaluation

Output: improvements plans

- Consistency
- Critical activities
- Frequency
- Methods
- Personnel

Sustainability Assurance



Circular Economy

- **Waste:** Zero waste to landfill verification, Waste Audits, Baselines and target setting for waste streams
- **Products:** Life Cycle Assessments, EPD, etc.
- **Sustainability strategies**

GHG Verification

- **Verification for Mandatory Reporting on GHG emissions** (EU ETS, Aviation EU ETS/CORSIA)
- Verification of Corporate Inventories for **voluntary reporting**
- Verification **of Carbon Neutrality** with PAS 2060 and SGS Carbon Neutrality Label
- **Product footprint verification:** PAS 2050, 14067 and GHG Protocol for
- Product Lifecycle **Accounting and reporting**

Carbon Management

- **Corporate carbon management solutions**
 - Carbon footprint and emission reduction strategies
 - Setting Science Based Targets (SBTi)
 - Net-zero strategies
- **Product carbon footprints** (ISO 14067, PAS 2050 or the GHG Protocol P)
- **Energy audits**, renewable energy assessment studies and energy efficiency measures

Why choose SGS



Railway Expertise

Recognized worldwide as the leader in our field, our team of experts has vast experience. For over 30 years, we have worked for the main rail manufacturers, operators, and many important suppliers to the rail industry.



Service Range

SGS offers services tailored to suit the unique challenges of the rail industry. Whether it's certification and compliance, to safety or design needs in mechanical, structural and electrical engineering. We've got the solution.



Your end-to-end partner

At SGS we provide services to cover the entire project lifecycle, from conception to completion to continuous improvement. We're your one-stop shop.



Global footprint, local expertise

Each client has unique requirements, but at SGS you know that through our vast network and deep local knowledge, you can expect consistent, world class services, support and execution, no matter your requirements or where you are in the world.



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