



Choose certainty.  
Add value.

## Complete system services

Manage all technical and operational aspects of railway and metro systems

### Your challenges

The rail sector is constantly in motion, with a wide range of new projects and upgrades being implemented in every market. Authorities, train operating companies and infrastructure managers need to ensure that both traditional and modern technologies are correctly integrated across the complete rail system. This requires a holistic in-depth knowledge of the entire railway system with all its subsystems, as well as experience in operation and maintenance. A combination of these areas of knowledge is essential to understanding the system as a whole.

### What are complete systems, and why are they important?

A railway system comprises a number of subsystems, including infrastructure, rolling stock, signalling and energy. Each of these subsystems must work safely and reliably alone as well as when combined into complete systems. Beside technical safety, further aspects such as operational safety and cyber security must be understood in order to ensure overall safety. Only organisations like TÜV SÜD – with strong knowledge and experience in all disciplines and at all technical levels, from the inner workings of a safety controller unit to the overall safety of a complete system – are able to make meaningful technical judgements.

### What kind of expertise is needed to manage complete systems?

A combination of different engineering disciplines, an understanding of the diverging viewpoints of all stakeholders, and experience of a wide spectrum of services – from engineering support to Independent Verification and Validation (IV&V) and Independent Safety Assessment (ISA) – are paramount prerequisites for the management of complete systems. Our engineers are specialists from widely diverse backgrounds and regions, with profound knowledge and hands-on experience. Based on our frequent dealings with safety authorities, TÜV SÜD understands approval requirements and can support customers to ensure a seamless process from their initial application to final approval.

### How can we help you?

TÜV SÜD is the international expert for rail sector services. Our experts at over 850 locations worldwide provide the skills and knowledge needed to ensure that your various systems function safely and reliably, both individually and in conjunction. We are your trusted partner for managing technical and operational aspects of complete systems.



## Our complete system services

TÜV SÜD provides a comprehensive range of engineering support, assessment and approval management services.

### ■ Engineering support

We offer engineering support through our subsidiary SIGNON for all phases of the life cycle, from planning to implementation, testing and commissioning. Our experience in integration of individual subsystems to form complete systems, spanning knowledge of interfaces, maintenance and operations, provides operators, integrators and authorities with comprehensive support, enabling them to excel in safety, reliability and operational performance.

### ■ Approval management

TÜV SÜD's support optimises approval management strategies and facilitates interfaces to safety authorities, ensuring smooth and time-efficient approval of your systems. We can provide these services for both individual subsystems and complete systems. We help to identify and comply with application- and region-specific approval requirements.

### ■ Independent safety assessment

TÜV SÜD has successfully demonstrated in numerous projects that accumulated knowledge over the entire technical spectrum of the complete system is of the utmost importance. From electronic and mechanical components, operating systems and subsystems such as rolling stock and signalling up to integration of all subsystems into a complete system, ensuring excellent operational performance – TÜV SÜD always has the right experts at hand to assess the safety and reliability of your system. We are experienced in supporting leading railway partnerships, authorities, operators, infrastructure managers and suppliers, covering both mainline and urban transit operations.

## Your business benefits

- **Save money** – by working with a single partner for all your complete railway and metro needs, and obtaining a single assessment report for the complete system.
- **Save time** – through our wealth of experience from various infrastructure projects, ensuring you avoid costly and time-consuming rework of requirements and specifications.
- **Minimise risks** – of issues linked to safety and reliability, by addressing them as early as possible, and thus avoiding lengthy delays and rework at a later stage.

## Why choose TÜV SÜD?

TÜV SÜD has been in the rail business for almost half a century. Throughout this time, we have worked hard to maintain our sterling track record in rail quality and safety. We are known to pursue a pragmatic and practical approach to achieving compliance with all requirements. Instead of merely focusing on processes, we emphasise in-depth technical evaluation. All over the world, TÜV SÜD is recognised as a railway safety assessor by many railway authorities and national safety authorities. Our teams, comprising more than 500 multidisciplinary rail experts, are thoroughly familiar with the complex interactions of rail tasks. In addition, more than 25 of our experts hold accreditation from the German Federal Railway Authority (EBA).

## Choose certainty. Add value.

TÜV SÜD is a premium quality, safety and sustainability solutions provider that specialises in testing, inspection, auditing, certification, training and consulting services. Represented at over 850 locations worldwide, we hold accreditations in Europe, the Americas, the Middle East, Asia and Africa. By delivering objective solutions to our customers, we add tangible value to businesses, consumers and the environment.

## Related services

TÜV SÜD provides the following related services:

- Embedded system services
- Urban rail system services
- Rail infrastructure services
- Rolling stock services
- Signalling services
- Railway energy services