

## Control and Signalling



Alongside the specific national applications of control and signalling in India, work is ongoing towards an interoperable, in other words cross-border, rail system.

In order to implement this interoperable so-called European Train Control (ETCS) and KAVACH, it is necessary to use, among others, the specific European Technical Specifications for Control - Command and Signaling (TSI CCS).

One of the main focuses of the work of TÜV India consists verifying the implementation of these European regulations for operation of an interoperable ETCS and KAVACH.

The components to be used on national basis for control-command and signaling are tested and inspected by our independent experts who are approved by the Federal Railway Authority (EBA). In addition to testing of components and systems, other examinations - such as design examinations and production checks and also supervision on site - are carried out.

We also offer inspection of complete vehicle equipment and track side installations in the range of control-command and signaling. TÜV India has its own NABCB accredited inspection body for railway engineering and technology and has the Notified Body TÜV NORD



Luxemburg, while all its inspectors are individually approved.

The interdisciplinary nature of our project teams mean that you not only profit from our specialist competence, but also from useful synergy effects.

TÜV India - Inspired by Knowledge.

### Our services:

#### Qualification of hardware

- Examination and assessment of system design, testing/evaluation of proof against failure, failure tolerance, failure manifestation, testing/assessment of man-machine interfaces
- Approval testing
- Acceptance of installations
- Final inspection of components at the factory
- Testing in the area of signaling and tele-communications equipment, e.g. GSM-R applications
- Testing in the area of telematics
- Testing of electrical systems, e.g. cables, power supply systems
- Support of participation in component approvals
- Component certification

#### Qualification of software

- Testing/assessment of data processing systems, operating systems, tools, diagnostic equipment and concept



- Static software analysis
- Certification of software systems

## System-related assessment

- Assessment of components and system characteristics, safety and function proofs
- Evaluation of operating requirements, system designs (diversity/redundancy), safety-related application condition
- Assessment of Hazard- and risk analyses, safety cases and creation of technical dossiers
- Examination of migration concepts
- Information on standards (CELENEC)
- ETCS - EC conformity assessments to 2008/57/EC

## Benefit to customers

- Protection of people and the environment
- Reports recognized by the relevant authorities
- Assurance of design compliance and feasibility

## Our expertise:

- Independence and neutrality
- Specialist independent experts with long-standing experience
- Assessors with ERA-recognition
- Assessors with EBA-recognition
- Accredited inspection body according to DIN EN ISO/IEC 17020 (DAkkS) and NABCB/IAF
- Notified Body (NoBo) (LUX)
- Designated Body (DeBo)
- Interims DeBo (DE)
- Associated partner of the German notified body

We look forward to sharing our expertise with you.

## TÜV India Private Limited

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## About Us:

TUV India Pvt. Ltd. (TÜV NORD GROUP) is a customer-focused, innovative, and independent, technical, quality & safety services organization, dedicated to providing future-proof solutions through technological excellence for the success of its customers with the highest level of integrity. With a presence at over 40 strategic locations in India; a branch office in Sri Lanka and Bangladesh; state-of-the-art laboratories at Pune, Bengaluru, Noida and Jamnagar; 100 important countries worldwide and through digital means, we are always connected to you, our esteemed customer, anywhere, anytime.

We are proud to provide increasing levels of services to the best known, largest global and national companies as well as medium and small industries in diverse sectors like Oil & Gas, Petrochemical, Nuclear, Renewables, Infrastructure, Food, Power, Manufacturing, Chemicals, Pharma, Paper, Automobiles, Railways, Aerospace, Defence, IT, Health, Hospitality, Retail, etc.

Over 1400 competent and experienced TÜV India experts spread across India and over 14000 TÜV NORD experts all over the world, enthusiastically support our clients by providing value-added services in Industry Inspection, European / International Approvals, Management System & IT Certification, Sustainability, Energy Audit, Water Audit, Carbon Services, Building Infrastructure & PMC, Renewable Energy, Food & Packaging Testing, Food Certification & Inspection; Testing of restricted and banned chemicals in Automotive and Electrical & Electronics components and other regulated industries, Product Testing – Electricals, Electronics and Industrial Machinery; Product Certification; Petroleum, Chemicals & Gas Cargo Inspection; Petroleum, Chemicals & Gas Testing; Railway Technology; Engineering, Safety Studies, and knowledge enhancing training programs under TÜV India Training Academy.

