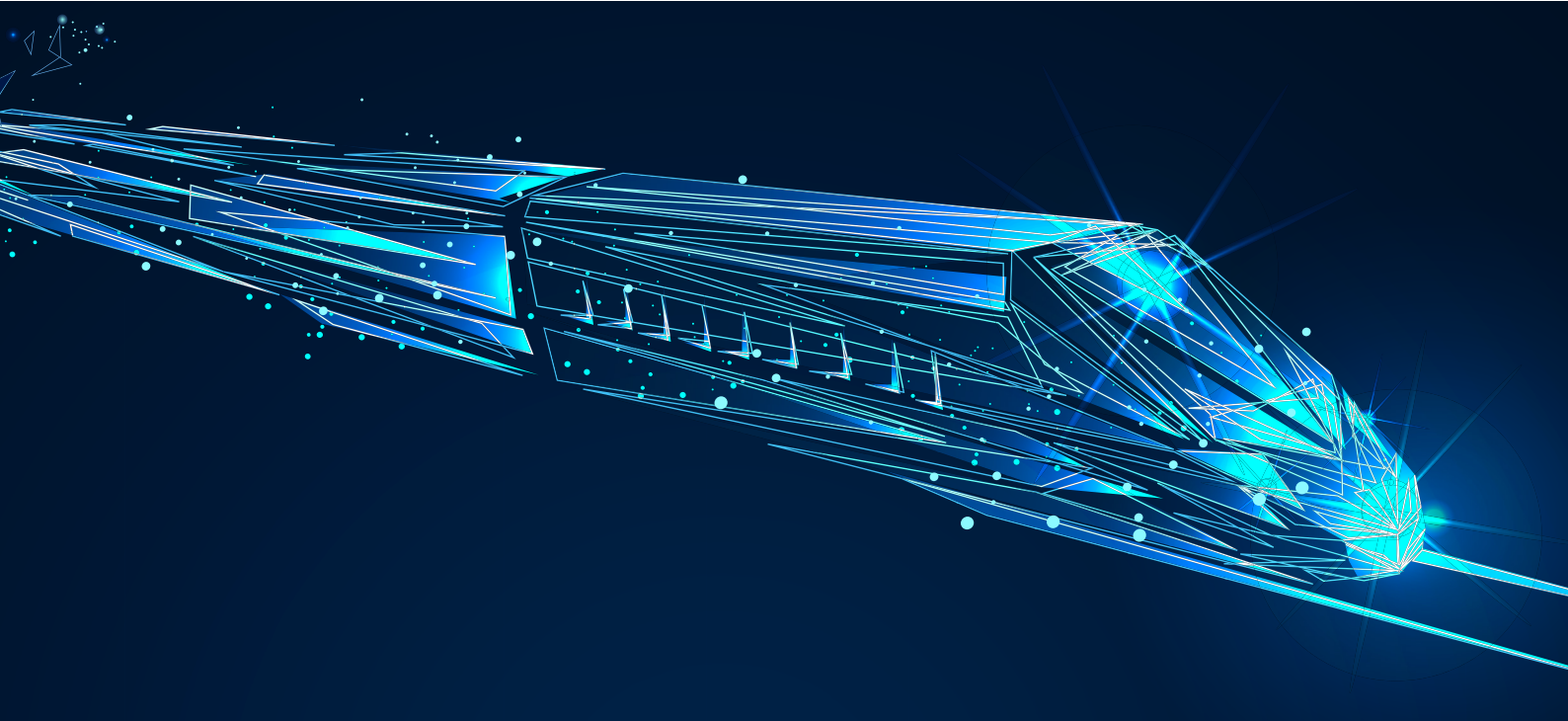




Industry Profile Railway Technology



Konzept
Informationssysteme



Safety at the highest level

There is hardly any other industry facing such huge challenges as the rail industry – growing world population, increasing urbanization and ever higher demand of resources. Future mobility will therefore focus particularly on the aspects of safety, environmental compatibility and sustainable economy.

The railway industry can only successfully master these challenges with intelligent and innovative traffic and rolling stock concepts. Modern, highly powerful and dynamic systems have consequently found their way into this industry for a long time already.

Energy efficiency and environmental compatibility

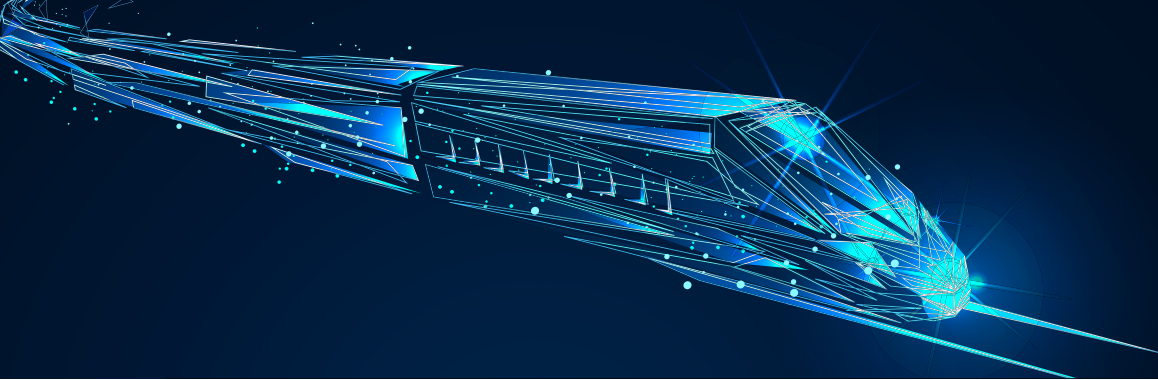
Energy-efficient power trains become more and more important from the perspective of sustainable mobility. Another challenge is posed by the strict emission regulations to be considered in product development by the railway industry. This can only be achieved by the application of new technologies in the fields of electronic engine control or exhaust aftertreatment systems as well as innovative concepts such as bi-fuel systems.

Scope of Services

- System and software development according to EN 50126, 50657 and 50129
- Verification and Validation
- Safety certification
- Requirements engineering
- Integration and unit tests

Intelligent and safe automation solutions

The use of safety-critical systems in the field of control and monitoring technology offers many advantages for railway automation. However, the aspect of safety needs to be considered with top priority at all times. This implies that the development of products and systems must be carried out in accordance with the current quality and safety standards governing railway technology.



Specific Project Experience since 1996

- BR 612 and BR 628 series:
- Design and implementation of a driver's cab simulator including graphic representation of status data
- Re-design of an existing platform software for tilting train systems (according to IEC 61508 SIL2)
- Powerline for rolling stock: Documentation and software development
- Development of telematic systems (client and server)
- Safety certification according to SIRM 200
- Tailoring of railway-specific standards to company-specific standard development processes
- Creation of systematic risk analyses for railway production and newly designed safe systems and architectures
- Safety Manager support implementation with safety management requirements
- Design and implementation within automated system tests with RCPTT as part of a tool qualification class T3 for railway station planning
- Design of railway display systems

Verification and Validation

- Validation of system requirements
- Validation of software requirements
- Validation of low-level software requirements (design review)
- Static code analysis (PCLint, QA-C)
- Code review
- Software testing
- Module test case definition
- Module test procedure definition
- HW/SW integration test
- Test case validation
- System / Unit testing
- Test case definition
- Test procedure definition
- Test case validation
- MC/DC coverage analysis (Cantata, VectorCast, Tessy)
- WCET analysis
- Object code analysis (OCA) / compiler analysis report (CAR)
- Compiler failure report (CFR)
- Tool qualification
- Floating point arithmetic analysis
- Formal verification

Systems Engineering

- Requirements engineering (system)
- System architecture and design

Software Development

- Requirements engineering (software)
- Software architecture design
- Modelling (SCADE, MATLAB, Simulink)
- Implementation

Support Processes

- Quality assurance
- Configuration management
- Process assistance and implementation

Standards

- IRIS
- EN 50126 (RAMS)
- EN 50657
- EN 50129
- IEC 61508 (up to SIL 3)

Tool Experience (synopsis)

- DOORS, Jira, Redmine, Hudson, Confluence
- Eclipse, OSGi, Tomcat, Apache Maven
- Git, SVN, Gitlab, Sonatype Nexus
- RCPTT, JUnit, Mockito, Xray
- Databases (MySQL, PostgreSQL, MSSQL)