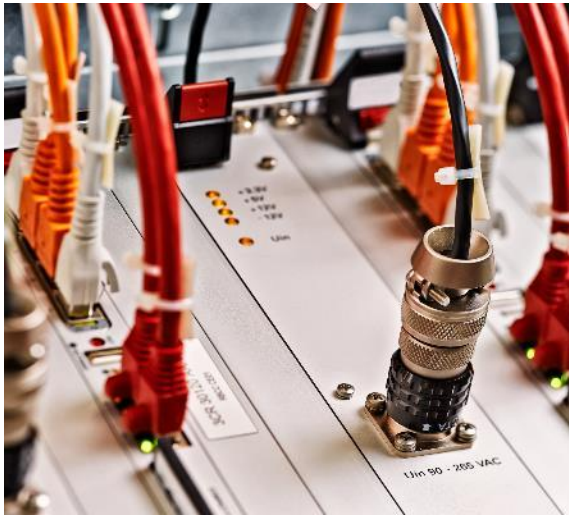


# Costs and risks of ETCS trackside projects

Implementation – Cost Drivers

Christian Löffler  
Senior Portfolio Architect – Vital Trackside, Hitachi Rail

# RailCor™ Radio Block Center



## Proven deployment & interoperability

Certified ETCS Level 2 RBC in service **since 2007 across 10+ countries**. Integrates with diverse interlockings, onboard units, and networks for high-speed, urban, mainline, and freight operations.

## Key Functions

- Dynamically generated authorizations based on real-time interlocking, train & track data
- Large spectrum of other operationally relevant functions (e.g. reversing, shunting, staff responsible/on sight)
- Safe transitions between ETCS levels and operational modes and class B systems
- Supports **national operational variants & mixed-level operation**
- Ready for Hybrid Train Detection (HTD) and advanced train position solutions
- Integrated juridical recording, diagnostics & crypto key management

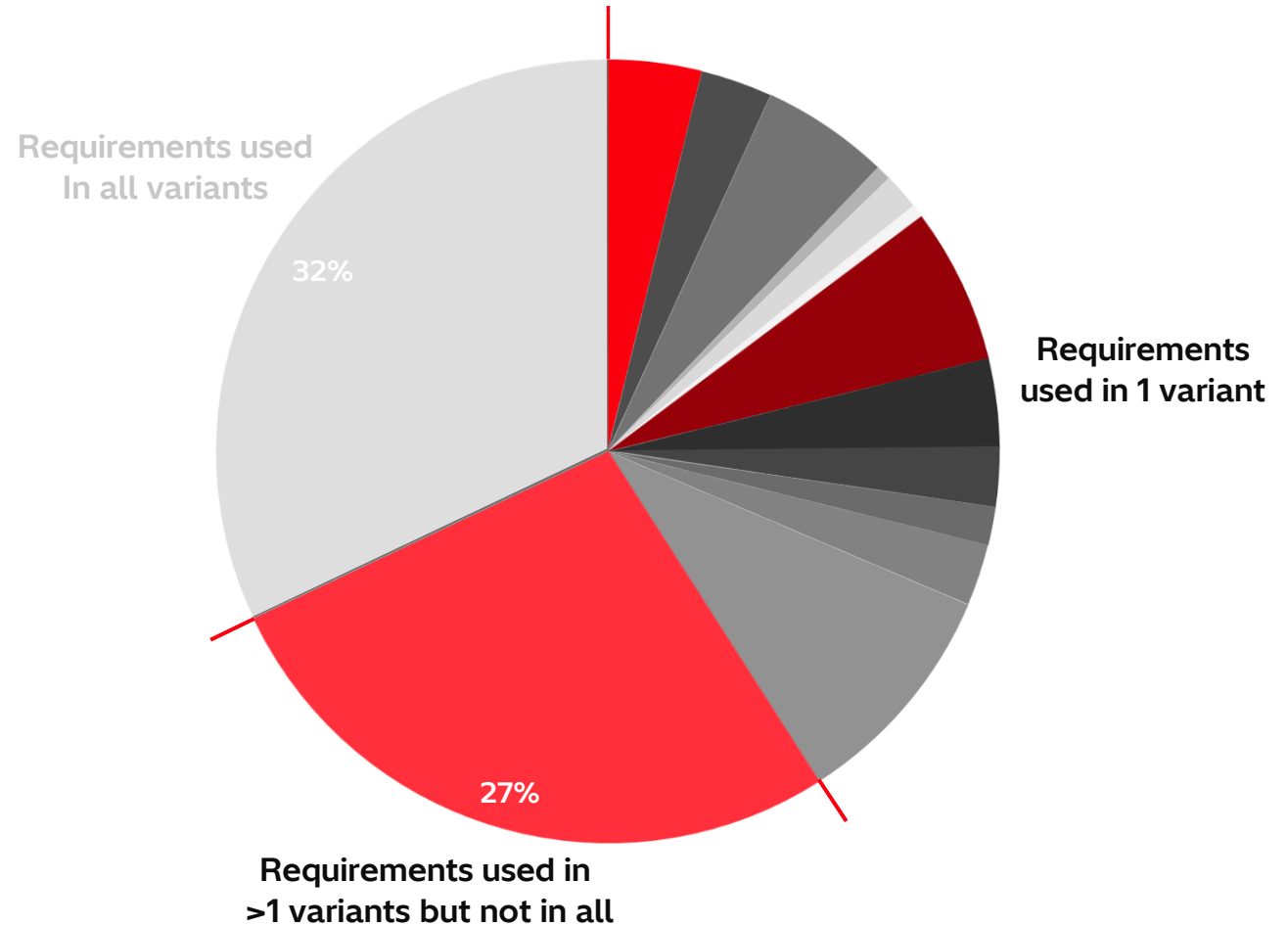
## Benefits

- Suitable for all traffic types (High-speed, Urban, Mainline, Freight)
- Highly scalable for small to large topologies
- Designed for SIL-4 safety & high availability
- Low integration and maintenance costs; supports upgrades & modern radio technology
- Interoperable with all major OBU, IXL, and NRBC vendors

# Details

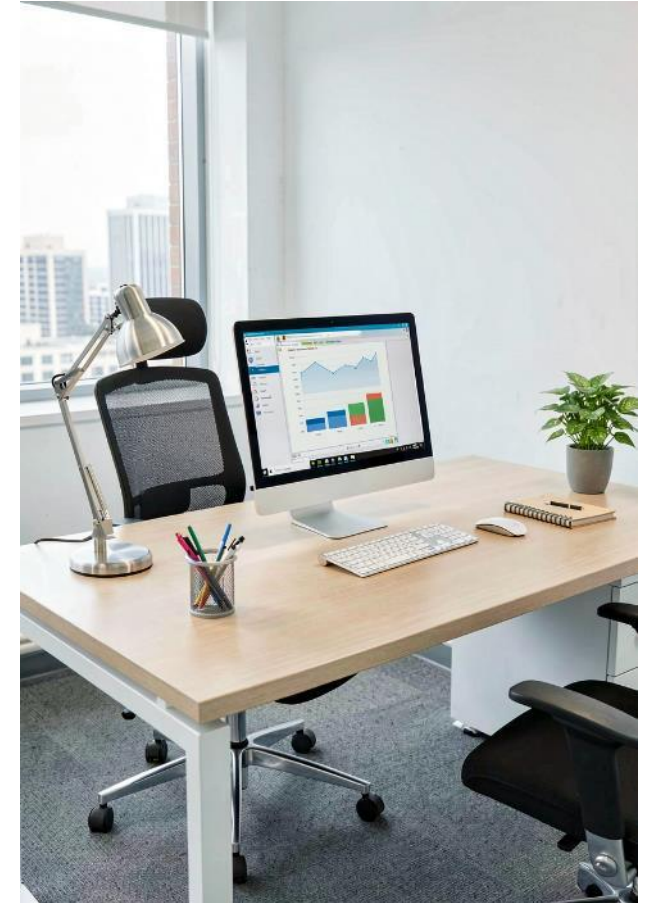
- RBC System is provided to > 10 customers
- RBC specification covers > 8,000 aggregated customer requirements – interface specification come on top
- National variations need to be handled by huge set of Features/parameters with their interdependencies

## RBC SRS REQUIREMENTS



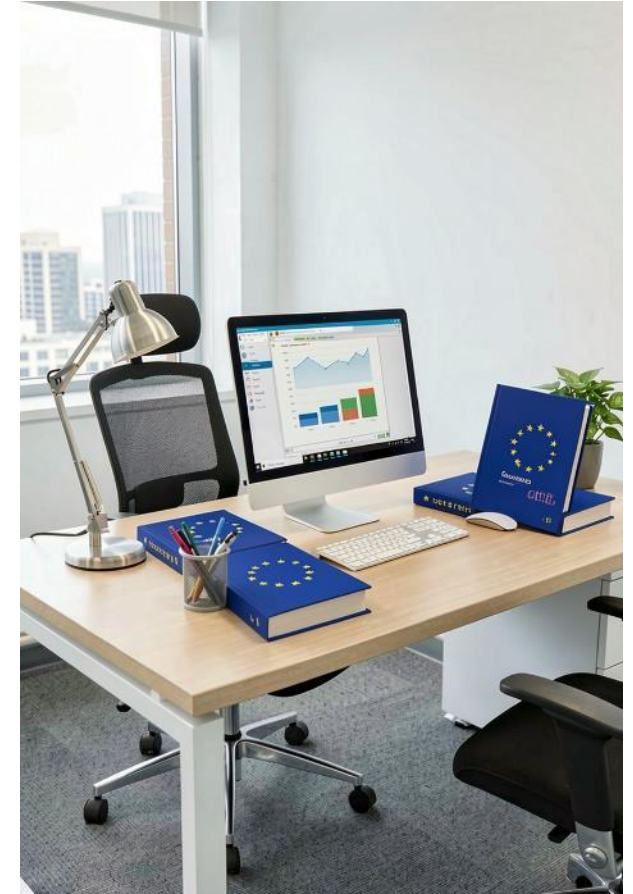
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  - **National requirements** reflecting country-specific rules, signalling principles, infrastructure, and legacy systems.
  - **Customer-specific requirements** for each project, driven by operational needs and integration constraints.
  - **Technical constraints** from integrating ETCS with existing railway environments and **legacy Class B systems** (e.g., PZB, KVB).



# Conclusion

## ⚙️ **Priority Levers to Reduce Cost**

- 1. Harmonise Engineering & Operational Rules**
  - Reduce replication of national Class B rules and apply European Operational Rules
  - Adopt unchanged standards
  - Use EU-level engineering guidelines

- 2. Industrialise & Automate Delivery**
  - Standard workflows & deployment processes
  - Unified data/configuration tooling
  - Artefact reuse across lines & IMs



**National Specific Effort**

- Rulebooks
- Tendering Specification Development
- Engineering & Integration
- Testing & Validation
- Safety Approval
- ...

**Supplier**

- Fewer products and variants to maintain
- Larger market per product
- Fewer resource bottlenecks

**Railways**

- More efficient procurement
- More efficient training and recruiting
- Life cycle optimisation
- Faster deployment

ETCS trackside projects are not inherently risky or costly because of technological complexity. They fail—and they become expensive—when complexity is introduced without harmonisation.

**Preventing national deviations** is the fastest way to cut costs, lower risk, and accelerate Europe's journey toward a truly harmonised railway.

**HITACHI**