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COURSE BROCHURE

ETCS Train Control and ERTMS Deployment Advanced Training Course

29 March – 9 April 2027
Rome

ETCS Train Control and ERTMS Deployment Advanced Training Course

Ref: 397_14091 **Date:** 29 March – 9 April 2027 **Location:** Rome **Fees:** 10500 GBP

ETCS Train Control and ERTMS Deployment is a 2-week advanced training course for mainline signalling engineers, rolling stock fleet engineers, rail infrastructure managers and assessors who equip routes and trains with cab signalling, and each participant completes an ETCS Route Deployment and Fleet Fitment Plan. Lineside signal renewals, cross-border freight corridors and the end of national train protection systems are making ETCS the default choice for new and renewed mainlines. The course is delivered by Jupiter Prime Training.

Why ETCS Train Control and ERTMS Deployment Matter Now

Three groups drive mainline train protection decisions today: infrastructure managers renewing ageing lineside signals, train operators and lessors who must equip mixed fleets, and freight and passenger services that cross several networks on one journey. When trackside and onboard rollouts are synchronised, routes gain capacity, interoperability and fewer signals to maintain; when they drift apart, fitted trains run on unfitted track and investment sits idle. The course rests on the European Rail Traffic Management System ERTMS and its train protection layer, the European Train Control System ETCS, as specified for interoperable mainline operation.

Who Gains Most from ETCS Train Control and ERTMS Deployment

- Trackside signalling engineers responsible for balise layouts, radio block centre design and interlocking links
- Fleet engineering leads responsible for onboard unit fitment, cab integration and train data entry
- Route and network planners responsible for deployment sequencing, possessions and legacy decommissioning
- Independent assessors responsible for verifying conformity and compatibility of onboard and trackside subsystems
- Operations and driver training managers responsible for rules, modes and transition procedures

An infrastructure manager and train operator gain most when they send trackside, fleet and assessment specialists together, because route deployment only pays back when the trains that use it are fitted and authorised at the same time.

ETCS Train Control and ERTMS Deployment Capabilities

Participants trace an ETCS route from the choice of application level to the first authorised train under full supervision.

- Weigh ETCS application levels against route traffic, cost and existing detection — infrastructure investment boards
- Design balise groups and radio block centre areas for a mainline section — trackside signalling engineers
- Specify onboard unit fitment for new and existing trains — fleet owners and lessors
- Calculate braking curves and their effect on running times — timetable and performance planners
- Test onboard and trackside compatibility before route opening — assessors and commissioning engineers
- Communicate mode transitions and legacy system boundaries to drivers — operations and training managers

Key ETCS Train Control and ERTMS Deployment Terms

- Eurobalise — a passive transponder fixed between the rails that passes position and route data to a train passing over it.
- Radio Block Centre — a trackside computer that sends movement authorities to trains by radio on higher application levels.
- Application Level — a defined configuration of ETCS equipment that sets how trackside and train exchange information.
- Full Supervision Mode — the operating mode in which the onboard unit continuously monitors speed against a permitted profile.
- Specific Transmission Module — an onboard interface that lets an ETCS train run under a legacy national protection system.
- Baseline — a consistent release of the ETCS specifications that onboard and trackside products are built to.

ETCS Train Control and ERTMS Deployment Day by Day

Day 1: Mainline Interoperability Context

- ERTMS Building Blocks — Separating ETCS, Radio and Traffic Management
- Legacy National Train Protection Systems — Assessing the Case for Replacement
- Corridor and Network Rollout Strategies — Choosing Where to Start
- Passenger and Freight Route Examples — Comparing Deployment Priorities
- Trackside and Fleet Business Cases — Balancing Who Pays and Who Gains

Day 2: Specifications and Baselines

- ETCS Baseline Structure — Selecting the Release for Products and Routes
- System Requirements Specification Reading — Locating Mandatory Functions
- Change Requests and Compatibility — Managing Mixed Baseline Fleets
- National Values and Engineering Rules — Setting Route-Specific Parameters
- Interoperability Constituents — Defining Product Boundaries for Conformity

Day 3: Application Levels and Modes

- Level 1 With Lineside Signals — Overlaying Existing Infrastructure
- Level 2 Radio-Based Supervision — Removing Lineside Signals
- Hybrid Train Detection Concepts — Testing Capacity Beyond Fixed Sections
- Operating Modes and Transitions — Handling Staff Responsible and On Sight Running
- Level Transition Borders — Designing Safe Entry and Exit Points

Day 4: Trackside Engineering

- Balise Group Placement Rules — Positioning for Location and Linking
- Lineside Electronic Units — Connecting Balises to Signal Aspects
- Radio Block Centre Area Design — Sizing Handover Between Centres
- Interlocking to Radio Block Centre Interfaces — Passing Route and Point Status
- Trackside Data Preparation — Verifying Gradients, Speeds and Track Conditions

Day 5: Onboard Equipment and Fleet

- European Vital Computer and Odometry — Securing Onboard Position Reporting
- Driver Machine Interface Layout — Presenting Speed and Target Information
- Train Data Entry and Train Categories — Setting Correct Braking Inputs
- Retrofit Engineering for Existing Classes — Fitting Cabs, Antennas and Cabling
- Specific Transmission Modules — Running Fitted Trains on Legacy Routes

Day 6: Braking Curves and Performance

- Braking Curve Model Inputs — Calculating Supervision Limits for Train Types
- Brake Percentage and Correction Factors — Tuning Curves to Real Fleets
- Running Time Impact Assessment — Protecting the Timetable After Migration
- Release Speed and Overlap Choices — Trading Safety Margins Against Throughput
- Freight Train Braking Variability — Handling Long and Heavy Consists

Day 7: Radio Communication

- GSM-R Network Requirements — Supporting Reliable Train to Radio Block Centre Data
- Euroradio Safety Layer — Protecting Message Integrity and Authentication
- Future Railway Mobile Communication System — Planning Migration From GSM-R
- Key Management Arrangements — Securing Cryptographic Keys Across Operators
- Radio Coverage Gaps — Defining Degraded Operation Along the Route

Day 8: Testing and Authorisation

- Laboratory Integration With Reference Test Benches — Proving Interoperability Early
- Route Compatibility Checks — Confirming a Fleet Can Run on a Route
- Conformity Assessment Evidence — Preparing Files for Independent Assessors
- Field Test Campaigns — Validating Trackside Data on the Live Railway
- Operational Trial Running — Building Reliability Before Commercial Service

Day 9: Deployment Programme Planning

- Synchronised Trackside and Fleet Rollout — Aligning Route Opening With Fitted Trains
- Possession and Cutover Sequencing — Minimising Disruption on Busy Mainlines
- Legacy Signal Decommissioning — Timing Removal of Lineside Assets
- Driver Competence and Rule Book Updates — Preparing Crews for Cab Signalling
- Lifecycle Maintenance and Obsolescence — Planning Software Upgrades Across Baselines

Day 10: Practising the ETCS Route Deployment and Fleet Fitment Plan

- Level Selection for the Case Route — Applying Application Level Trade-Offs
- Trackside Layout Draft — Applying Balise and Radio Block Centre Rules
- Fleet Fitment Schedule — Applying Retrofit and Transmission Module Choices
- Authorisation Evidence Map — Applying Compatibility and Conformity Checks
- ETCS Route Deployment and Fleet Fitment Plan — Completing Sequence, Risks and Milestones

Applying ETCS Train Control and ERTMS Deployment After the Course

- Map every train class using a candidate route against its onboard baseline and fitment status, and flag classes that would block route opening.
- Run a braking curve check for two representative train types on one route section to test whether timetable running times can be kept.

ETCS Train Control and ERTMS Deployment Questions FAQ

What is ETCS train control and ERTMS deployment, and why does it matter now?

It is the planning and engineering of standardised cab signalling on mainline routes and the trains that use them. It matters now because lineside signal renewals and cross-network services make ETCS the main option for replacing legacy train protection.

Which roles gain most from ETCS train control and ERTMS deployment training?

Trackside signalling engineers, fleet engineers, route planners and independent assessors gain most. You will see how a decision on one side, such as a baseline choice, changes the work and timing on the other.

How does ETCS train control and ERTMS deployment training differ from a metro train control course?

It addresses long mainline routes, mixed passenger and freight fleets and interoperability between networks. A metro course concentrates on dense single-operator lines, while this one deals with application levels, legacy transmission modules and route compatibility across many train types.

What do you bring back from ETCS train control and ERTMS deployment training?

You bring back a route deployment and fleet fitment plan for a mainline section. It links application level, trackside layout, fleet retrofit and authorisation evidence into one schedule your organisation can test against its own network.

ETCS Train Control and ERTMS Deployment: The Way Forward

The ETCS Route Deployment and Fleet Fitment Plan first informs which route section and train classes should move to cab signalling together. Infrastructure managers, fleet owners and assessors use it to agree milestones and evidence. After its first use, revisit the baseline and radio sections, because specification releases and the move beyond GSM-R will reshape later stages of the rollout.