





Andrew Simmons

Director, Future Train & Operational Control Systems

1. ERTMS is ...

• European Rail Traffic Management System

- Constituent parts:
 - European Train Control System (ETCS)
 - Euroradio (Railway-specific GSM: GSM-R)
 - European Operating Rules (EOR)
 - European Traffic Management Layer (ETML)

2. ETCS Level 2 Equipment



3. Regulatory Background

• The Railway Safety Regulations (RSR) 1999 requires the installation of a form of train protection on the railway

-TPWS provides an interim solution

- The Railway Interoperability Regulations 2006 require compliance with the Command and Control Technical Standard for Interoperability (TSI)
 - -Requires fitment of ERTMS on all defined Trans European Routes when upgraded and on all new rolling stock
- The 2001 Uff/Cullen joint inquiry following train collisions at Southall and Ladbroke Grove recommended ERTMS fitment to all High Speed Mainline routes
- SRA formed the National ERTMS Programme (transferred to Network Rail in 2005) to examine the business case for ERTMS

4. Dec 2007 Business Case Analysis



5. If ERTMS is fully adopted

- ERTMS Level 2 cumulative benefits include
 - Delivery of key elements of the Operations Strategy
 - Performance/ capacity/ journey time/headcount/7 day railway
 - Reduced infrastructure CAPEX
 - Reduced infrastructure maintenance costs
 - Reduced driver route training
 - Enhanced safety
 - Greater supply market capability with long term sustainability of overall system
- But also has cumulative cost implications
 - Increased rolling stock equipment
 - Increased rolling stock maintenance

6. DfT Commitments

Department for Transport	Route Type	Route	Rolling Stock Fitment	Infrastructure Fitment
ERTMS NATIONAL IMPLEMENTATION PLAN	High Speed	Great Western Main Line	from 2013 to 2018	from 2017 to 2035 (majority % complete by 2025)
		East Coast Main Line	from 2013 to 2022	from 2018 to 2035 (majority % complete by 2025)
		West Coast Main Line	from 2014 to 2027	from 2027 to 2030
		Brighton Main Line	from 2011 to 2022	from 2021 to 2025
		South West Main Line	from 2014 to 2025	from 2017 to 2034
		Midland Main Line	from 2015 to 2027	from 2021 to 2023
	Conventio nal	Great Eastern	from 2015 to 2023	from 2027 to 2029



8. What will it take to deliver the defined programme successfully?

- Cambrian Early Deployment Scheme has identified the following issues
 - Industry commercial arrangements
 - Complexity of installation for retrofit activities
 - The latest migration addresses these lessons by
 - reducing the amount of retrofits by 30%
 - Defers retrofits so agreement with TOCs can be in franchise agreements
- Other issues include
 - Development of GSM-R to include packet switching capability
 - Development of ERTMS Level 2 Baseline 3.0.0 functionality which provides fully interoperable functionality
 - Development of ERTMS Level 3

9. Challenges

- Technology development
 - ERTMS Level 2 Baseline 3.0.0 specification
 - ERTMS Level 2 with packet switching GSM-R communications
 - ERTMS Regional or Metro
 - ERTMS Level 3
- Cross Industry Commercial arrangements
 - Rolling Stock Release and Train Fitment
- Industry change
 - ERTMS Trainborne equipment
 - Driver Training
- Integration with other major programmes
 - Great Western, Crossrail, Thameslink, Electrification, IEP



ERTMS Implementation Plan - proposed

When	What
1 (By 2014)	 The Cambrian Early Deployment Scheme will be operating by 2011 with ERTMS Hertford National Integration Facility operating by 2013 (Hertford to Stevenage). Class 377 for Thameslink expected delivery 2010, ERTMS fitted. No additional infrastructure (expressed in terms of SEUs) in the Baseline Plan will be fitted with ERTMS
2 (By 2015)	 Extended trial of GSM-R voice in Strathclyde area completed in 2010 GSM-R infrastructure rollout completed in 2014 GSM-R voice deployment in all rolling stock and fully operational by 2015 GSM-R voice quality of service across whole network with data Quality of Service on the HS lines (except CTRL).
3 (By 2019)	 Rolling stock for the Inter-City Express Programme (IEP) will be supplied ERTMS fitted and operational over the GWML and ECML. Infrastructure fitment (expressed in terms of SEUs) in the Baseline Plan for GWML overlay will be completed and ECML will have commenced.
4 (By 2024)	 ECML (South) Infrastructure will be complete Nearly half of passenger trains (or power cars), all freight locomotives and on-track plant in the Plan will be fitted with ERTMS MML (South) Infrastructure fitment will have progressed further
5 (By 2034)	 Majority of passenger trains (i.e. no Southern trains fitted), all freight locomotives and all on-track plant in the Plan will be fitted with ERTMS by 2034

Industry View of Future System Configuration



System Vision – component parts



FT&OCS Development Road Map

