The European Standardisation for Rail Signalling

ERTMS and UGTMS

ERTMS & UGTMS

ERTMS

European Railway Traffic Management System

UGTMS

Urban Guided Transport Manangement System

Presentation :

- ERTMS standardisation
- ERTMS application in Spain
- UGTMS standardisation

Overview of the European Train Management System

1- Introduction

European Traffic Management Layer
E.T.M.L
(Management oriented)

Global System Mobile devoted to Railway
GSM-R
(Communication oriented)

European Train Control System
ETCS
(Safety oriented)

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2- European Train Control System (ETCS)

The key objectives of ETCS

- To develop an harmonised train control-command system as a key to the interoperability of the trans-European railway network ; It will be an internationally interoperable signalling and safety system (instead of the 15 different signalling systems existing in Europe);

- To open up signalling equipment markets, cut equipment life cycle costs, and enhance the railway signalling industry 's competitiveness on the world markets;

- To bring out new practices in contractual relations between railway companies and industry, replacing purely technical specifications with requirements for in-service performance.

2- European Train Control System (ETCS)

Three functional levels for ETCS implementation :

- **ETCS LEVEL 1 : Based on fixed signalling blocks and lineside signals. This automatic train protection system uses intermittent (Eurobalise) or semi-continuous (Euroloop) track-to-train transmission to control the train speed;**

- **ETCS LEVEL 2 : Based on fixed blocks and a cab display (ground signals become optional). This automatic train control system performs a continuous speed control function using continuous bi-directional radio communications and intermittent transmission (for train location purposes);**

- **ETCS LEVEL 3 : This automatic train control system performs a moving block continuous speed control function using continuous bi-directional radio communications and intermittent transmission. The train location and integrity functions are also performed by the train itself.**

2- European Train Control System (ETCS)

Track-to-train communication systems have been based on magnetic transponder technology (balises) and are based on two different systems :

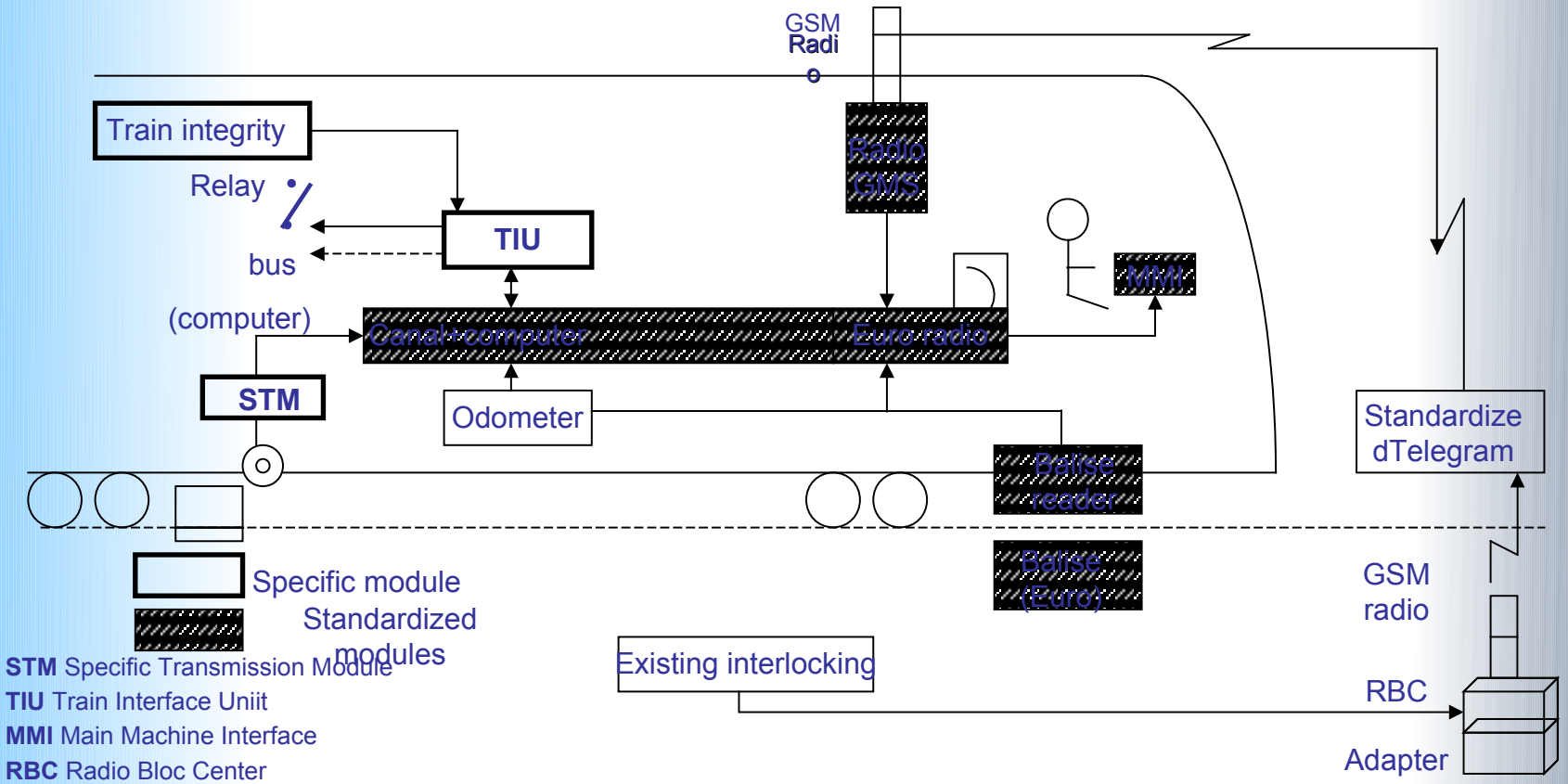
- EUROBALISE, for intermittent transmission, is based on magnetic transponder technology (balises) and provides a failsafe, high-speed communications link between track and train.

- EURORADIO, for continuous transmission.

Overview of the European Train Management System

2- European Train Control System (ETCS)

ETCS SYSTEM (simplified presentation)



STM Specific Transmission Module
TIU Train Interface Uniit
MMI Main Machine Interface
RBC Radio Bloc Center

2- European Train Control System (ETCS)

The benefit of ETCS

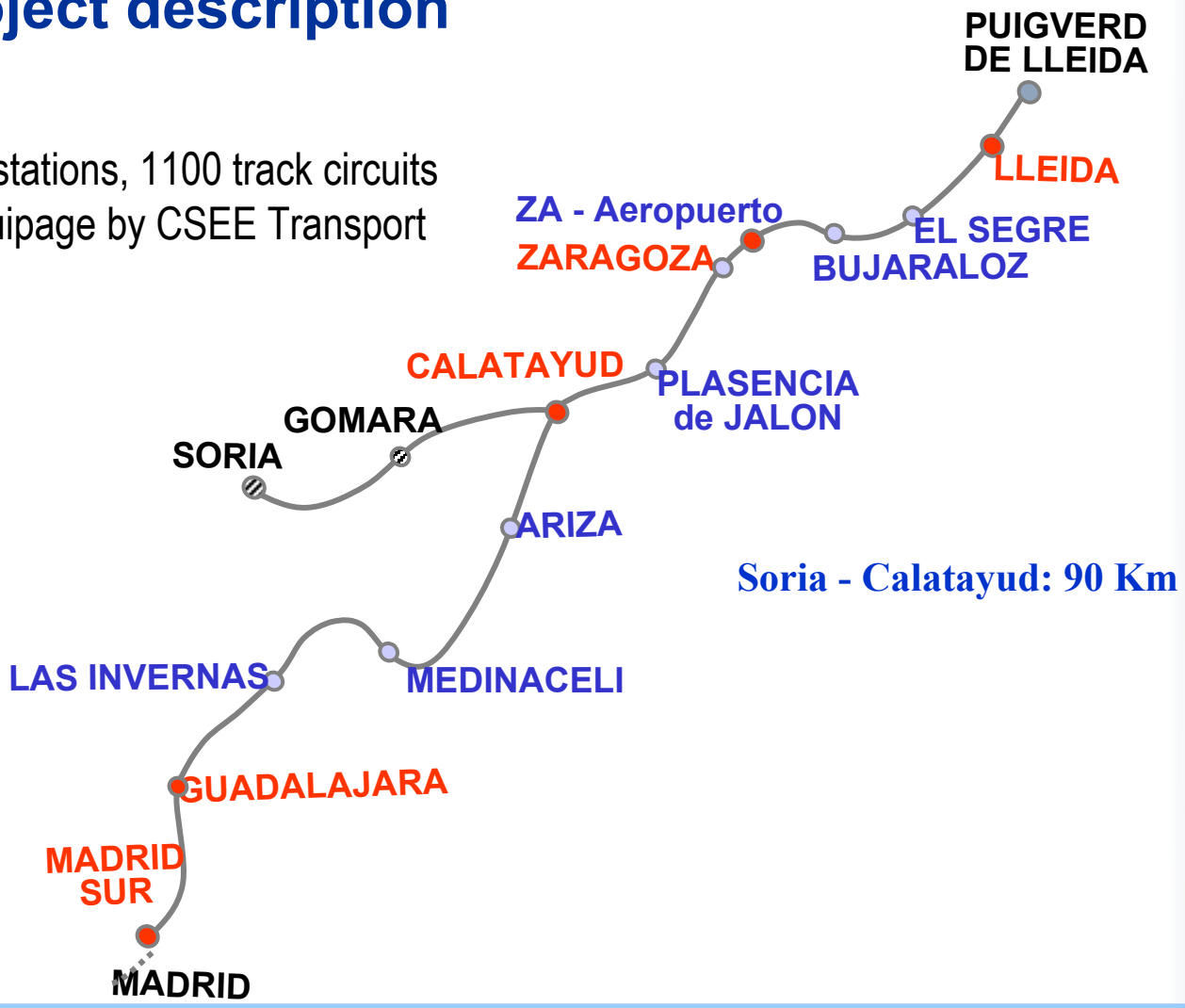
In short :

- Optimised performance and safety on the high-speed and conventional rail networks ;
- Compatibility with existing systems and scope for phased implementation ;
- International interoperability and a seamless railway system
- Lower operating and maintenance costs.

MADRID-LERIDA Line equiped with ERTMS

Project description

440 Km, 13 stations, 1100 track circuits
24 trains equipage by CSEE Transport



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Spain System Requirements

MODE	PERFORMANCES	REQUIREMENTS	PRODUCTS	REMARKS
Continuous transmission with GSMR	350 km/h 2' 30	ETCS 2	Full supervision By RBC	Bloc length 1500 m
Fall Back Ponctual transmission with Eurobalise	300 km/h 5' 30	ETCS 1	SEI LEU EUROBALISES	Radio failure Block length 6 Km
Non Equipped Trains	220 Km/h 8'	ASFA	SEI ASFA + Wayside Signals	Block length 6 Km

UGTMS Scope

- – *Signalling and Interlocking*
- – *Train control*
- – *Traffic management functions*
- – *Energy supervision*
- – *Maintenance support*
- – *.....*

For Metro, Light Rail, Tram-trains and Regional Trains

UGTMS Objectives

Create an open and competitive market by

- – *harmonised legislation*
- – *common specifications*
- – *generic soft and hard products*
- – *plug and play product approach*

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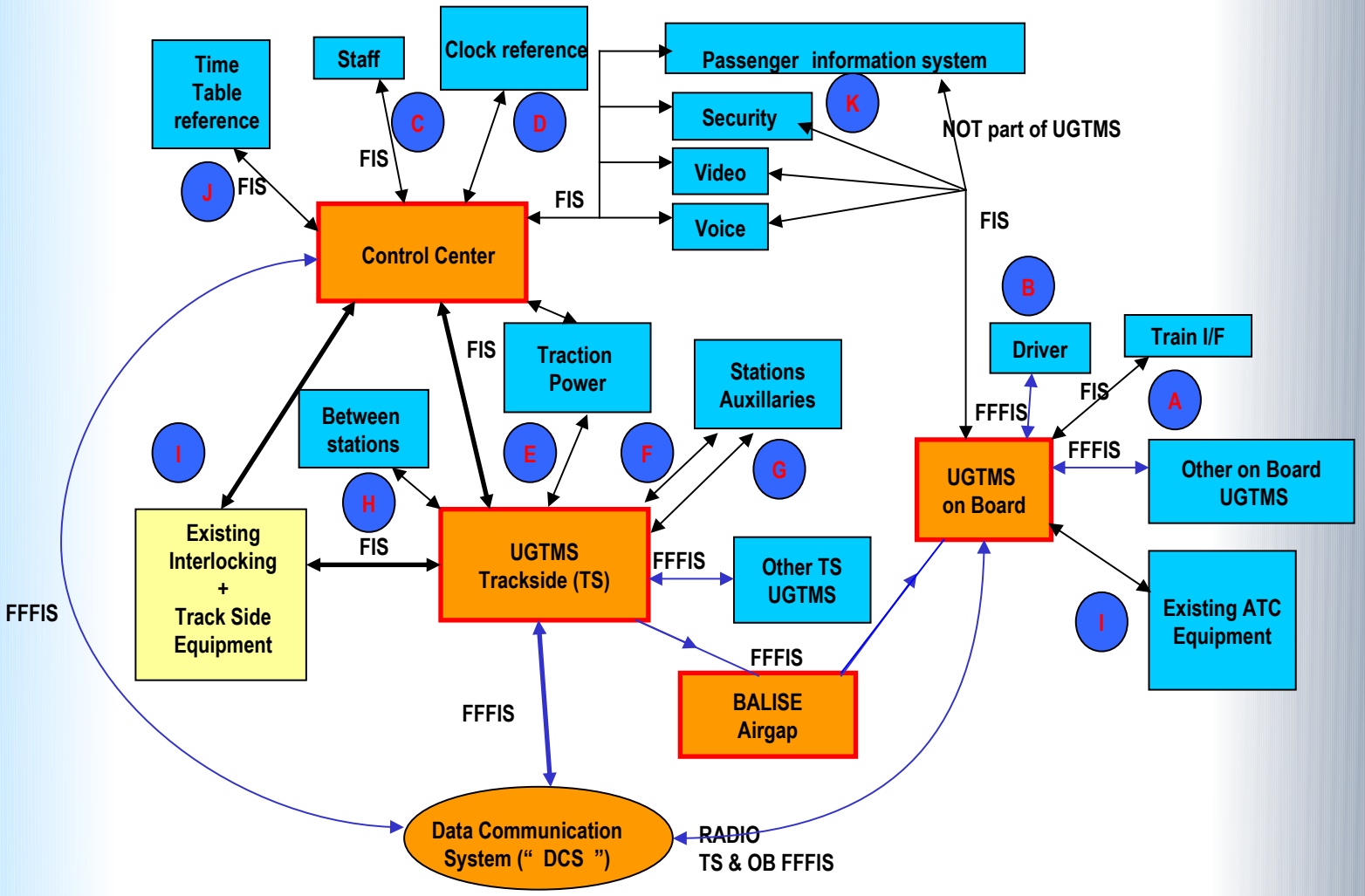
UGTMS Methodology

- – *Review of ERTMS FRS and SRS for an urban network*
- – *Assess ERTMS products in urban environment*
- – *Benchmarking (BVG, LUL, RATP, NYCT, …)*
- – *Define UGTMS specifications and standardised products*
- – *Real scale Demonstrators*

UGTMS System structure and interfaces



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UGTMS Timescales

3 main steps

- – *2002/2003: Functional requirement definition*
- – *2004/2005: System design*
- – *2006/2007: Prototype development & validation*