

William W. Hay Railroad Engineering Seminar

“ERTMS/ETCS L2 - Issues and Challenges in the Certification Process”

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Italcertifer



Date: Friday, April 1, 2016

Time: Seminar Begins 12:20 pm

Location: Newmark Lab, Yeh Center, Room 2311
University of Illinois at Urbana-Champaign

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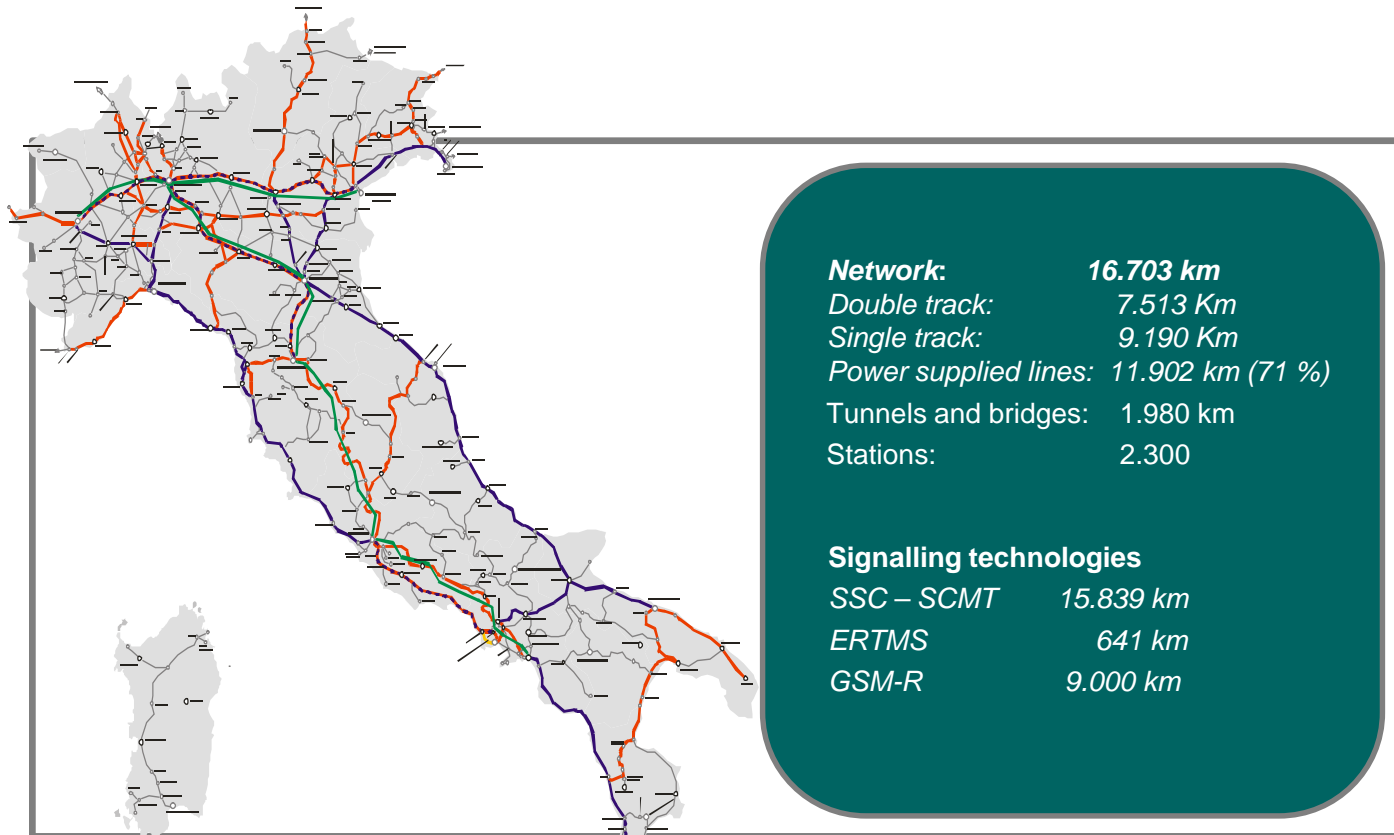
HAY SEMINAR, April the 1st 2016

ERTMS/ETCS L2

Issues and challenges in the certification process

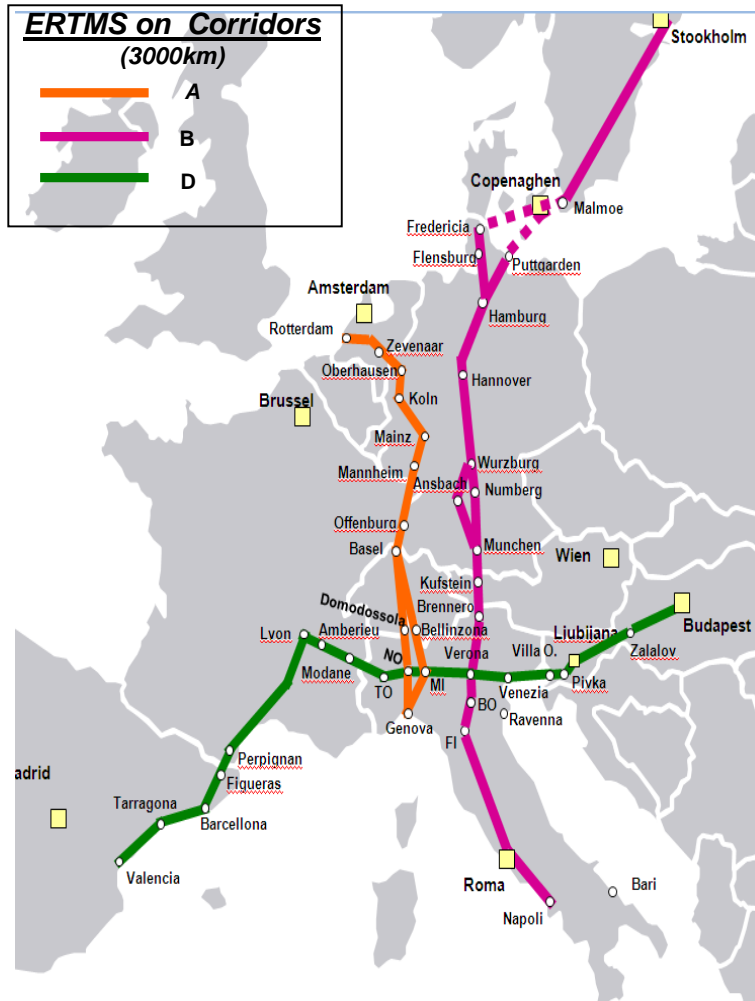
**University of Illinois at Urbana-Champaign
205 North Mathews Ave., Urbana, IL 61801-2352**

Italian railway infrastructure



- ~ 1.000 km High Speed
- ~ 950 km City network
- ~ 2.900 km Basic performance
- ~ 3.900 km Medium performance
- ~ 7.950 km Low traffic line

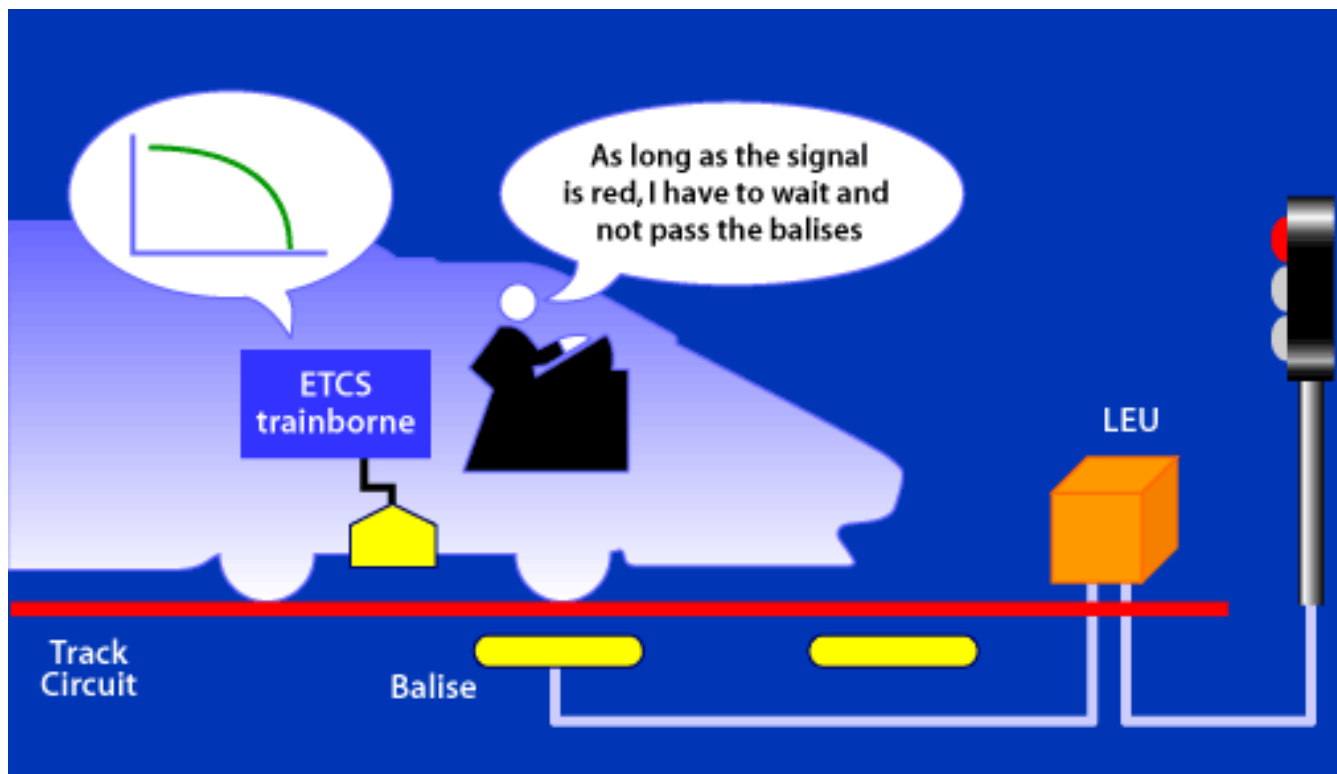
ERTMS in Italy – State of the art



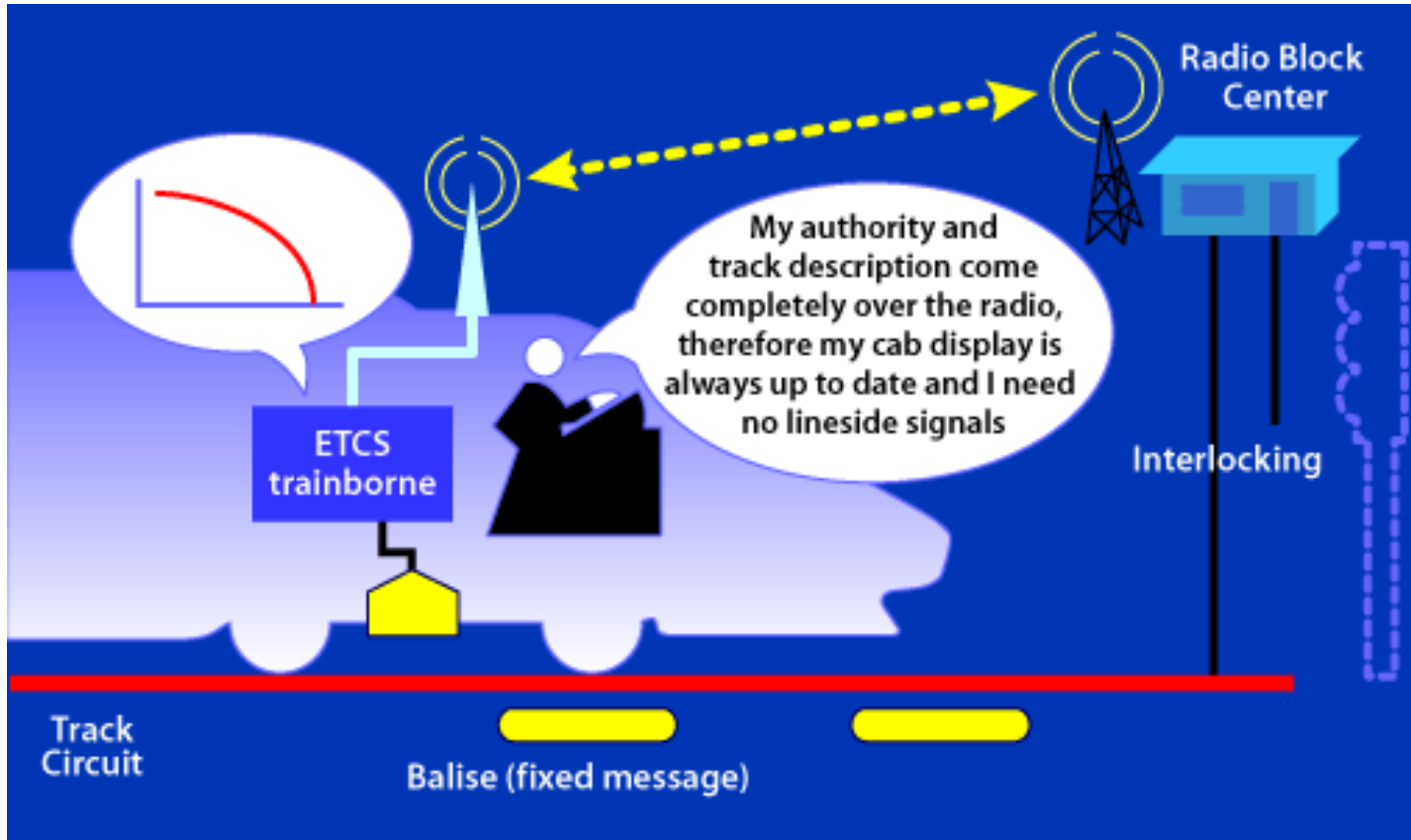
Benefit for integration of two Italian ETCS Project:

- HS/HC
- Corridors

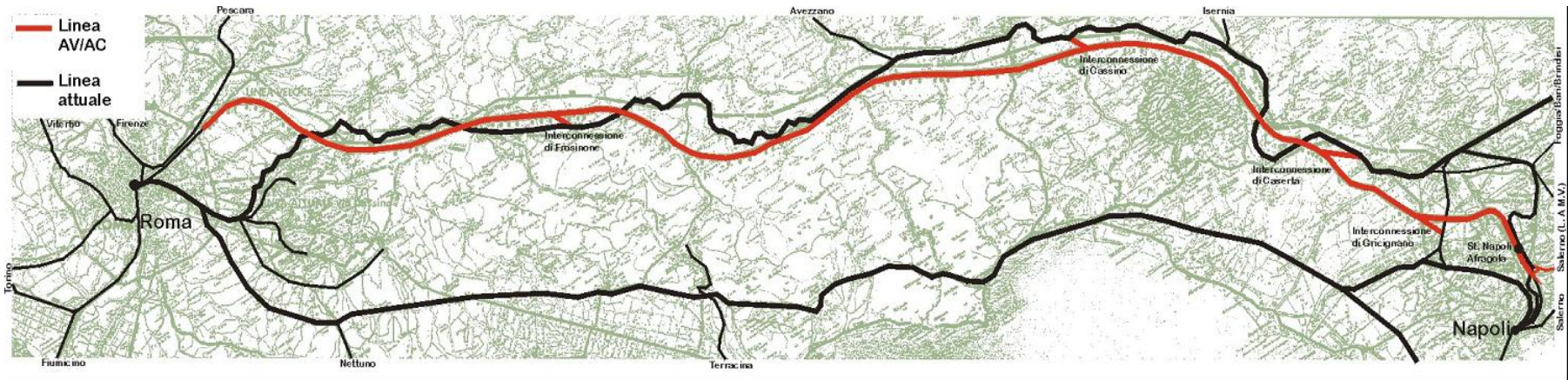
ERTMS Lev 1



ERTMS Lev 2



Roma-Napoli: the first ERTMS HS line L2 in the world



- YEAR 2005
- HS LINE
- THE FIRST LINE WITH ERTMS/ETCS L2

Rome-Naples: the main challenge

UNISIG

CENELEC



CCS-ON BOARD

CCS-TRACKSIDE

Anybody there?



Roma-Napoli: the solution



The Bologna-Firenze: the main challenge

La linea ad alta velocità

I NUMERI DELLA NUOVA LINEA

78,5 km Lunghezza totale
4,7 km Lunghezza allo scoperto
73,8 km Lunghezza gallerie
35 minuti Tempo di percorrenza
362 Km/h Velocità record toccata



Fonte: RFI

ANSA-CENTIMETRI

- YEAR 2009
- 80 KM UNDERGROUND HS LINE
- ERTMS/ETCS L2

The Bologna-Firenze: the main challenge

- Ensure that the stop limits of the trains were in correspondence with the exodus points in gallery

- Cooperative shortened MA

The Bologna-Firenze: the solution

Evaluation of the implementation of the requirements expected for the project with traceability matrixes

Lab tests, with exact replicas of on-field products (INTERLOCKING, RBC, ON-BOARD SUBSYSTEM)

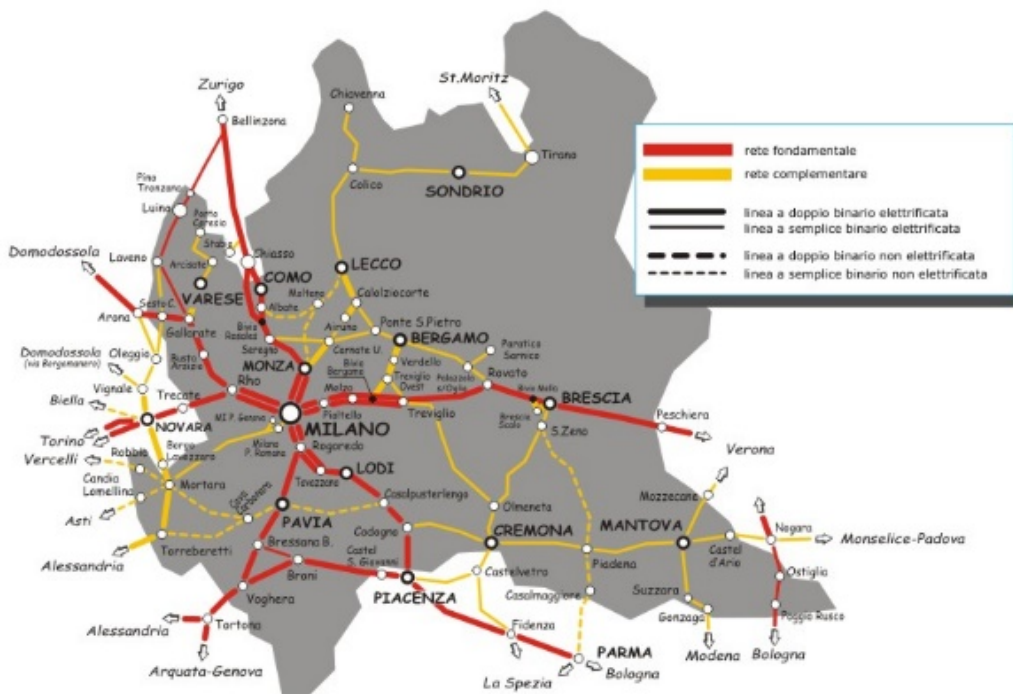
On-field tests with two trains, in order to replicate realistic operational scenarios

The Bologna-Firenze: the solution

Deep assessment of safety related application conditions exchanged between the various subsystems (INTERLOCKING, RBC, ON-BOARD SUBSYSTEM)

Overall global safety assessment following CENELEC standards, in order to evaluate the achievement of the global tolerable hazard rate

The Milano-Treviglio: the main challenge



- YEAR 2015
- ERTMS Level 2 Baseline 3 (latest issue of the ERTMS with the new braking curves)
- Use of the ERTMS and Italian National System

The Milano-Treviglio: the main challenge

- Overlapping ERTMS system to traditional systems
- Have a line managed with a mixed traffic

The Milano-Treviglio: the solution



- Managed with operational procedures
- The analysis of non-intrusiveness of the ERTMS on the traditional system (trackside and IXL side)

AUSTRALIA-RIO TINTO

Driverless trains with ATO

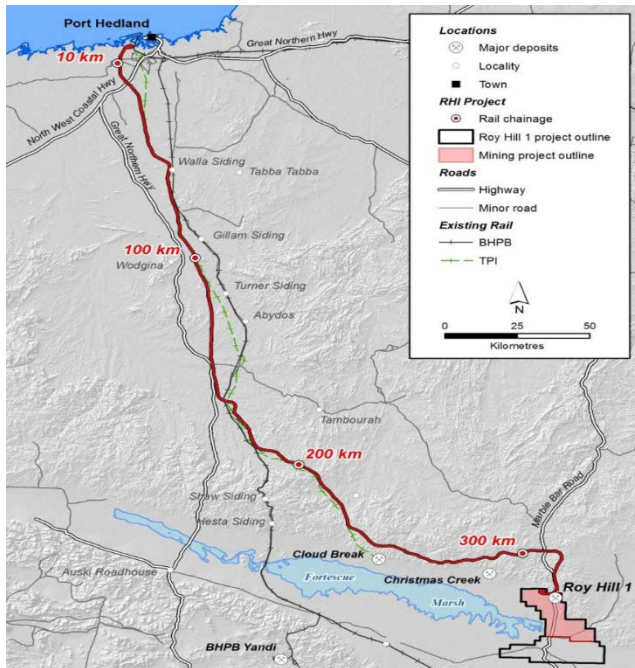


AUSTRALIA-ROY-HILL

Satellite tracking of train



AUSTRALIA-ROY-HILL



- Satellite Localisation of the vehicles, in order to avoid the necessity of eurobalises along the track, achieved with the use of an augmentation network implemented trackside
- Management of the ERTMS and the interlocking in an integrated solution
- Management of different type of vehicles (fuel trains, track maintenance trains, Hi Rails)



Thank you for your attention