

Eurailspeed

Parallel Session D.5

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Technology, an essential
but not exhaustive key factor for
the High Speed success

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Consorzio Saturno

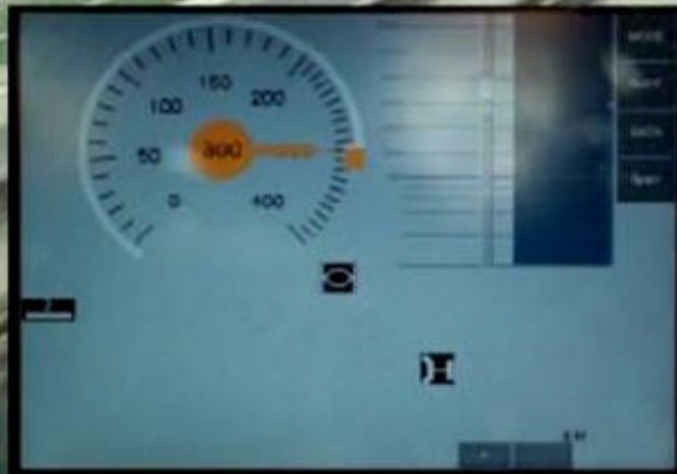
- Consorzio Saturno is the nominated sub-contractor for the fixed installations of the ongoing High Speed lines in Italy
- Founded in 1986 to embody in a unique organization all the necessary competencies for the High Speed project
- Composed by:
 - Alstom Ferroviaria
 - Alstom Transport Systems
 - Ansaldo Segnalamento Ferroviario
 - Ansaldo Trasporti Sistemi Ferroviari
 - Balfour Beatty Rail
 - Sirti

High Speed is reality in Italy ...



23 April 2004

An ETR 500 travels at more than 300 km/h under the sole control of ERTMS Lev 2



Rome–Naples:

Trial Running started Sept. 2005

Turin–Novara:

Trial Running about to start



... and what is behind it?

- State of the art technology for High-Speed Railways

but also:

- The strategic view of the Italian Railways committed to the realization of an Italian High Speed network, part of the transnational corridors Lisbon-Kiev and Berlin-Palermo
- Governance
- Dedicated management
- Goal oriented Client, Contractors and Companies



According to Consorzio Saturno mission, this achievement is the result of ...

- ...**cooperation**: among all parties involved in the High Speed complex contractual structure, where Saturno provides technology
- ...**competencies**: Consorzio Saturno, through its forming partners, owns the know-how and the competencies required to design and supply High Speed fixed installation technologies
- ...**ability to create and manage innovation**: the consortium has conceived a highly innovative system, adherent to CENELEC norms and ERTMS specifications, whose development occurred concurrently with that of the Italian High Speed system
- ...**synergies**: the continuous integration with RFI competencies has steered the definition of the High Speed Railway system architecture to make it also compatible with the needs of the final user



The High Speed technology context

- In Italy, the choice of ERTMS Liv. 2 system, has lead to the development of new products and to a new technological system architecture
- By the consequence, the typical process, applicable to a project based on consolidated technology where key success factors are a time conscious management and the re-application of successful templates for systems and products, is no longer effective
- In a project based on innovative technologies like Italian High Speed, key success elements have turned to:
 - the know-how to develop new equipment
 - the ability to design and integrate a system around such equipment
 - management able to master the innovation process



Innovative equipments and technology

- Radio Block Centre systems
 - developed for Rome-Naples and Turin-Novara
 - governing train movement and distancing, based on radio GSM-R for vital data transfer to the train (ERTMS Level 2)
- Digital Audio Frequency joint-less track circuits
- Solid state interlockings at wayside locations, exchanging vital data with the RBC system and among adjacent locations through standard fiber optic telecommunication network
- Multi point, moving heart, oleo-dynamic switch machines
- Detailed and full coverage centralized diagnostic system



System integration highlights

- Integration between NVP and RBC
 - Communication protocol based on Euroradio
 - Integration also between equipment of different consortium partners
- Integration between RBC and GSM-R
- Integration between ERTMS and national signaling system at interconnections between High Speed and existing lines
- Integration between High Speed and existing lines traction power (25 kV a.c. e 3 kV d.c. respectively) at boundary points
- Electro Magnetic Compatibility between 25 kV a.c. Traction Power system and signaling equipment



Innovation and Management

- The challenge of innovation has been tamed with:
 - an organization articulated in focused teams to:
 - promote cooperation:
 - within the consortium to face technology integration
 - with RFI to tailor new technologies to railway expectations
 - with the General Contractors to integrate the respective activities and merge them in a common plan
 - manage the line testing phase and handle in real-time the technical/procedural problems arisen from the line testing phase
 - project risk management analyses for control and feedback actions to criticalities arising from the new technology scenario



Innovation and Management:

cooperation teams

- System Board:

- composed by experts of Saturno and its partners for all applicable engineering specialties
- focused and empowered to solve major technology integration topics

- Plenipotenziari:

- a permanent joint committee with RFI, Italferr and General Contractor and Saturno representatives
- established to jointly discuss key technical issues relevant to design, safety, and availability having an impact on the operation of the system
- empowered to take timely decisions and allocate resources for problems resolution



Innovation and Management:

testing phase team

- The activities for the line testing phase are managed by an interdisciplinary Task Force (formed by key personnel of RFI, Trenitalia, TAV, Italferr, General Contractor, Saturno) which:
 - defines strategies for system testing
 - ensures coordination and consistency among the different practices of all specialties involved in line testing (train, rules and procedures, technologies, civil works, existing network operation, emergency organizations)
 - investigates and solves technical issues highlighted from system testing
 - supports the test phase with a flexible on site testing environment designed to accelerate the testing campaign through the execution of specific tests stressing the system



Innovation and Management: risk management

- Project Risk Management has lead to:
 - deeper understanding, based on quantitative data, of risk areas and project phases to be closely monitored
 - perform corrective actions to mitigate the risks domed by the consortium
 - supply guidance to decision processes driven by risks knowledge