

HIGH SPEED LINE IN MOROCCO



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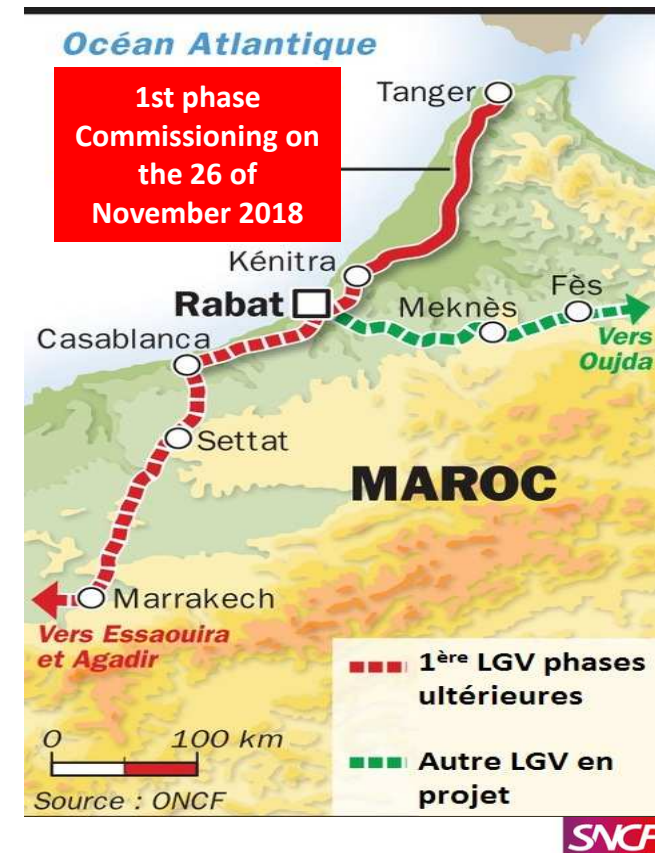
PROJECT DESCRIPTION

HSL TANGER - CASABLANCA

- The line connects the major economic hubs of the Kingdom of Morocco with a travelling time reduced from 4h45min to 2h10min from Tanger to Casablanca, and 1h20min instead of 3h45min between Rabat and Tanger.

1st African HSL

- A complex project, integrated and technically complex
- 200 km of double track line designed for 350km/h , commercial speed of 320km/h . Includes:
 - ✓ The entire Studies, Design and works for infrastructure (earthworks and civil engineering)
 - ✓ The entire Studies, Design and works for the railway equipment's (tracks, signalling, catenaries, electric traction, GSMR)
 - ✓ The entire supply chain (Ballast, Rails, switches)
- Purchase of 12 Alstom 2N2 type trainsets specially fitted for Morocco named RGV (HS Rolling Stock for Morocco)
- A depot dedicated to the maintenance of RGV trainsets
- Adaptation of terminal installations to enter the stations of Tanger and Kenitra
- Building 4 HS stations: Tanger, Kenitra, Rabat Agdal and Casa Voyageurs
- Support to prepare the launch of the operational service



ONCF'S NETWORK

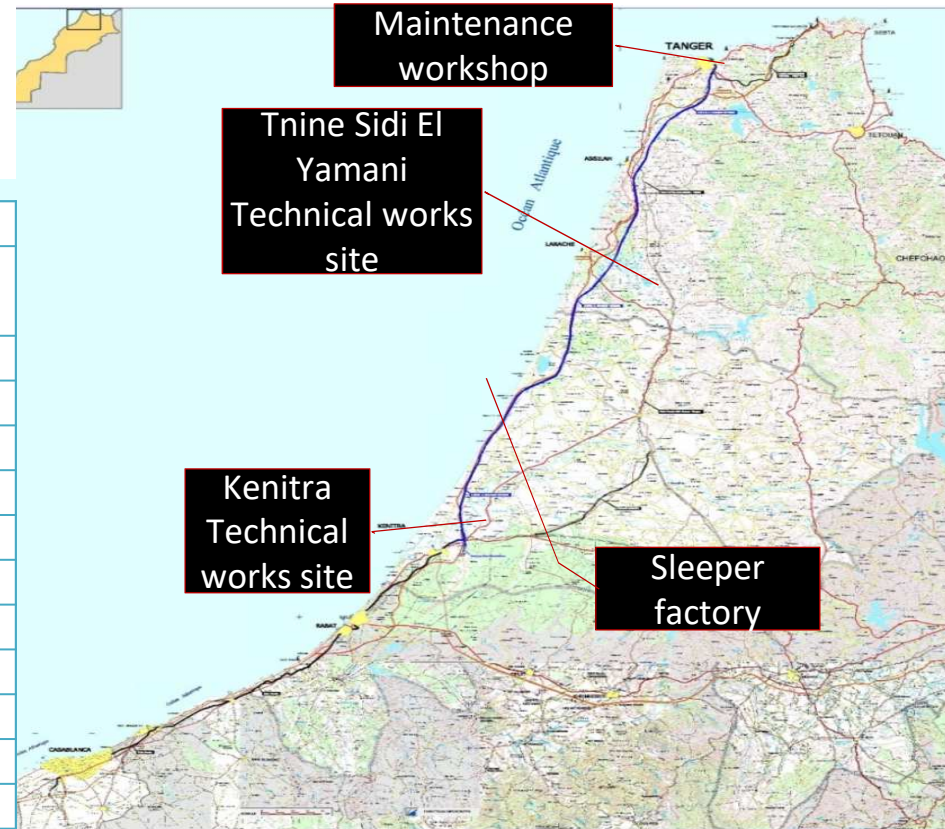


HSL TANGIER KENITRA

Application of the Technical Specification for Interoperability

A reference system: The East-European HSL

| | |
|--------------------------------------|----------------------------|
| Lands | 1 800 Ha |
| Cuttings and embankments (earthwork) | 67 Millions m ³ |
| Viaducts | 13 units (9800 ml) |
| Railway and road bridges | 169 units |
| Hydraulic structure | 117 units |
| Tracks | 800km of rail |
| 25KV catenaries | 400 km |
| Switches and crossings | 100 units |
| Reinforced concrete sleepers | 700 000 units |
| Ballast | 1,6 millions Tones |
| Substations | 2 units |
| Substation command centre | 1 unit in Rabat |
| Remote control station | 1 unit in Rabat |



PROJECT COMPLEXITY

Integration in the Moroccan railways industry

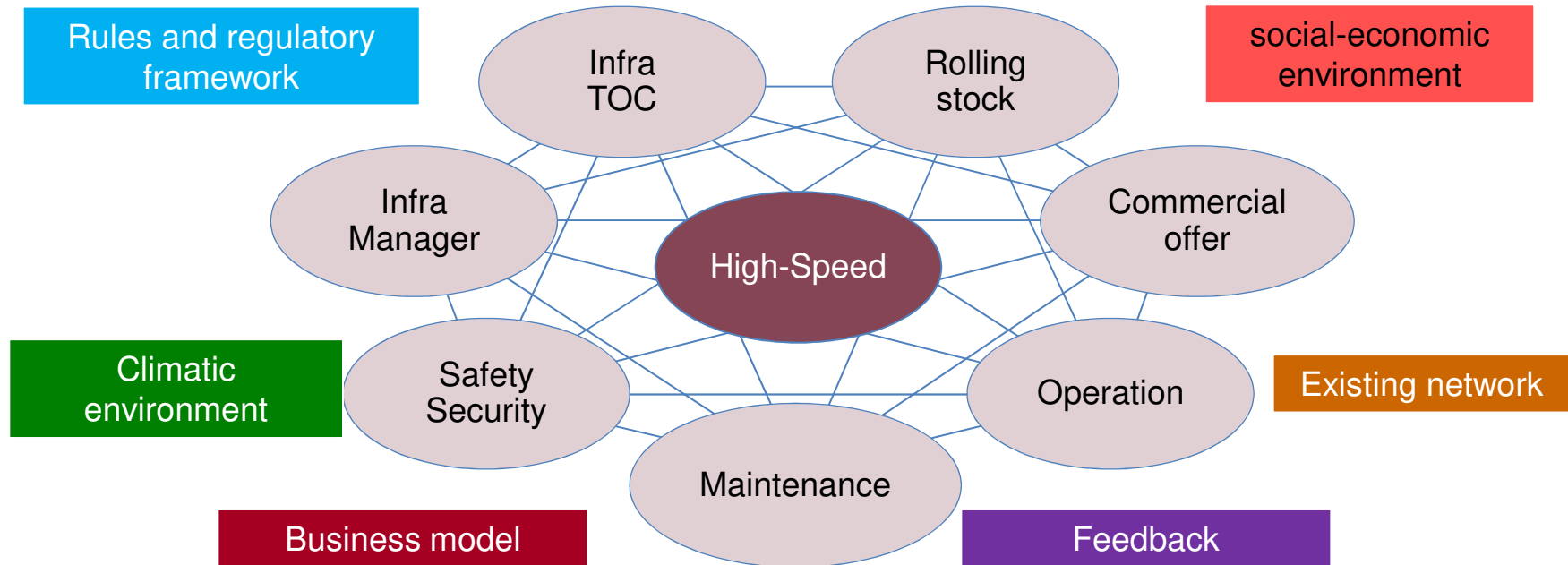
- High Speel Line is 10% of the railway network of the Morocco kingdom
- High technology in **disruption** with the rest of the network;
- The need for local actors to evolve:
 - + Adaptation of the **construction companies** and local design **Consultants** to the size, the high technicity of the project and to the level of high expectation of quality and methods to realize the works of a HSL;
 - + The volume of **interfacing with administrations** of the Morocco Kingdom;

The environment of the Moroccan HSL is the same as the most complex HSL built in France:

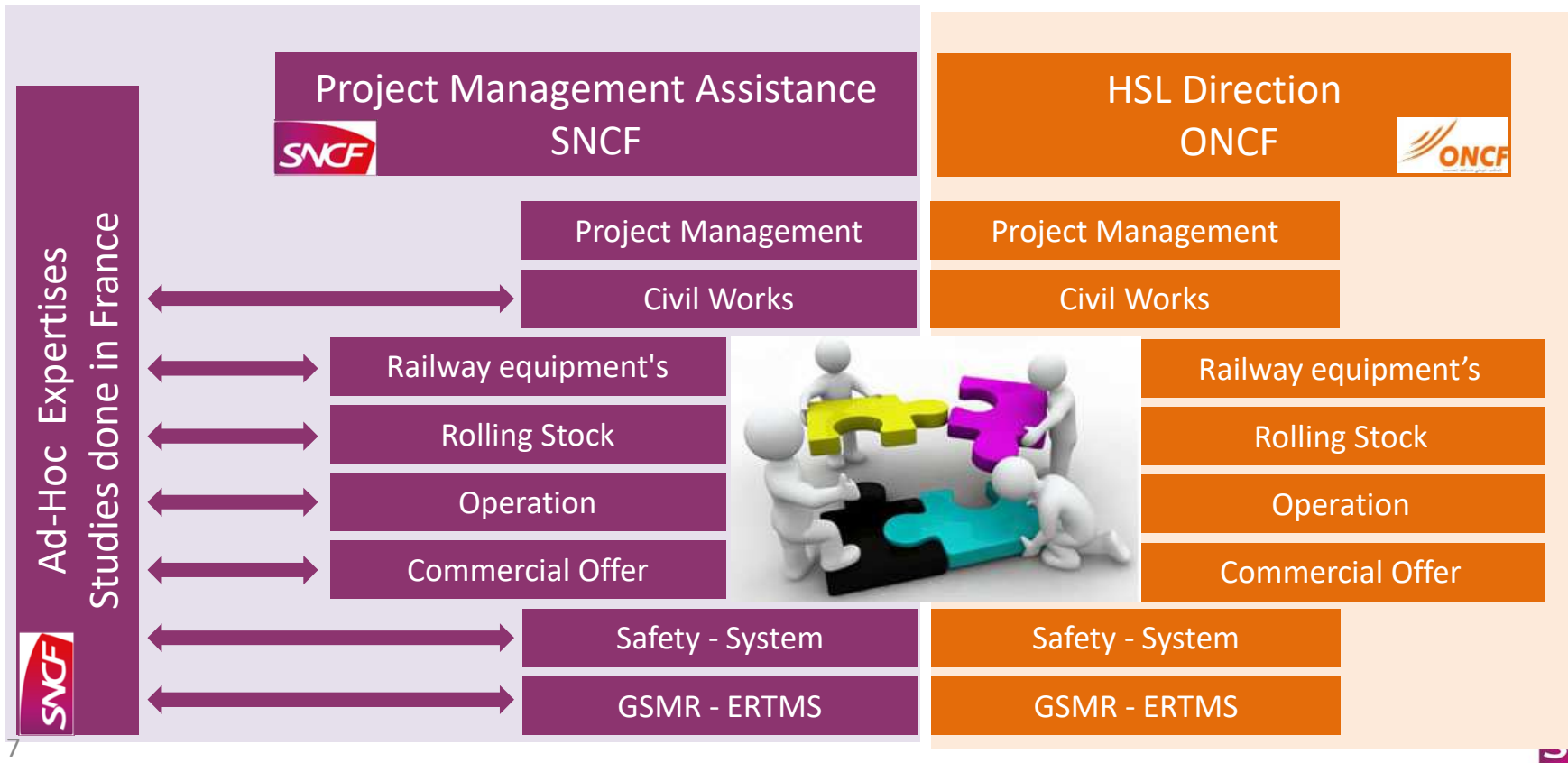
- Major geotechnical constraints
 - + Poor quality of the ground on most of the route
 - + Setting standards criteria targets for HSL (less than 1 cm of soil compaction during the first year and less than 10 cm during 25 years)

« HIGH-SPEED»: A COMPLEX SYSTEM

A real Know-How to help change management



A PARTNERSHIP ORGANIZATION



A PARTNERSHIP TO SHARE THE KNOW-HOW

- After cooperation during construction phase , creation of two joint ventures

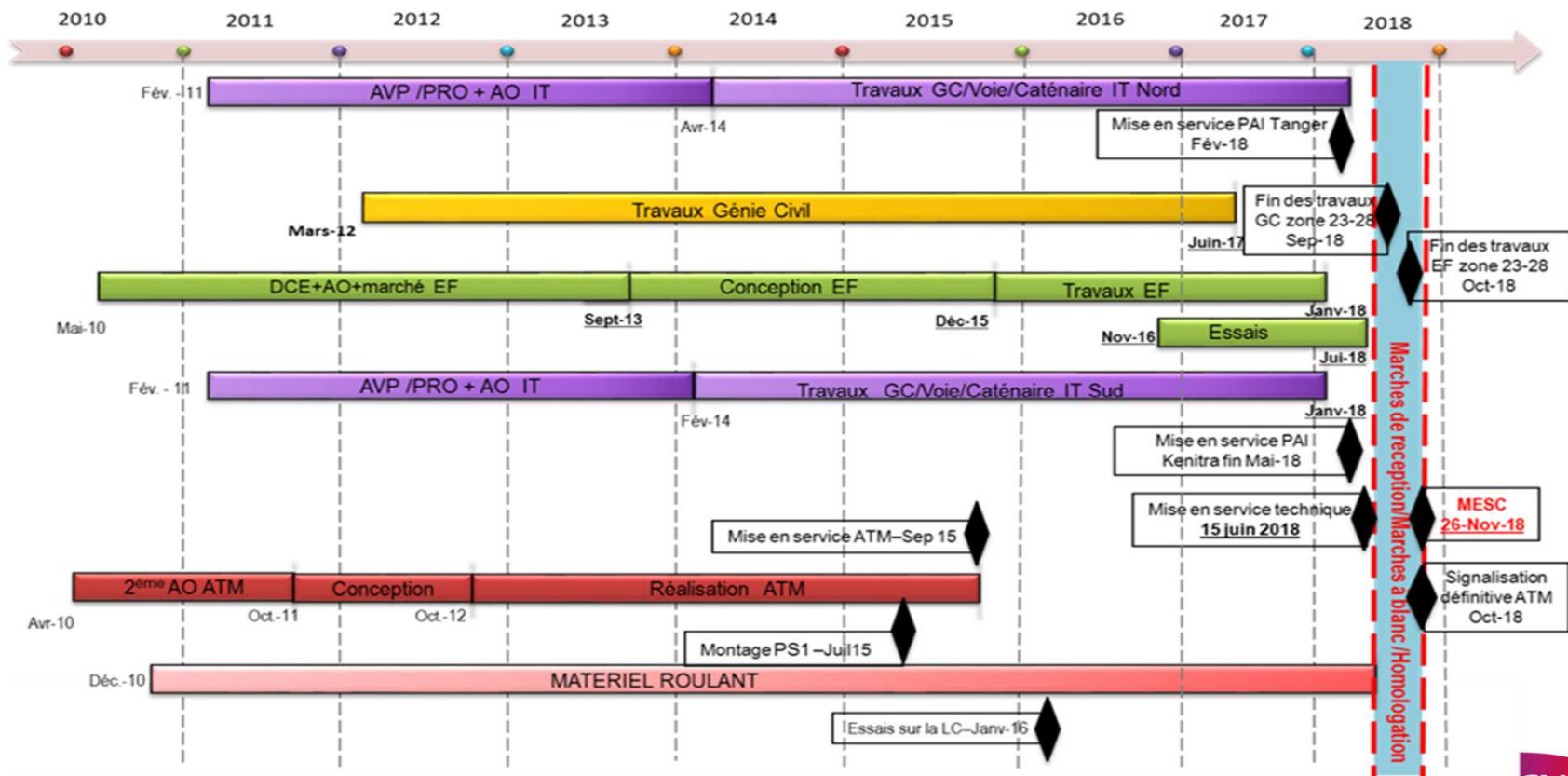
A training railway institute



A company for maintaining high-speed trainsets



A 8 YEARS PROJECT





THANK YOU !!