



**Including safety and testing  
in long-term procurement  
*Focus on the ETCS Level 2 and interlocking  
contract for Belgium***

Yves **WERNER**

Manager Signalling System Prescriptions





- 1. ETCS2 and New Interlocking Program**
- 2. Technical Development approach**
- 3. ETCS2 Testing & Safety Strategy**
- 4. Infrabel ETCS Test Center**



# 1

## ETCS2 and New Interlocking Program

1. ETCS2 and New Interlocking Program

# Long Term Contract for ETCS2 Program execution



**ETCS Level 2 is one of the 3 pillars of the ETCS Master Plan in Belgium**

**Contract awarded to  
Siemens & Fabricom  
2015 – 2025**

**Contract Scope  
2500 km track ETCS2  
1900 km track New IL**

**Turn-Key Contract  
Maximum  
Responsability on  
Contractor**

## 1. ETCS2 and New Interlocking Program



### 3 pilot lines

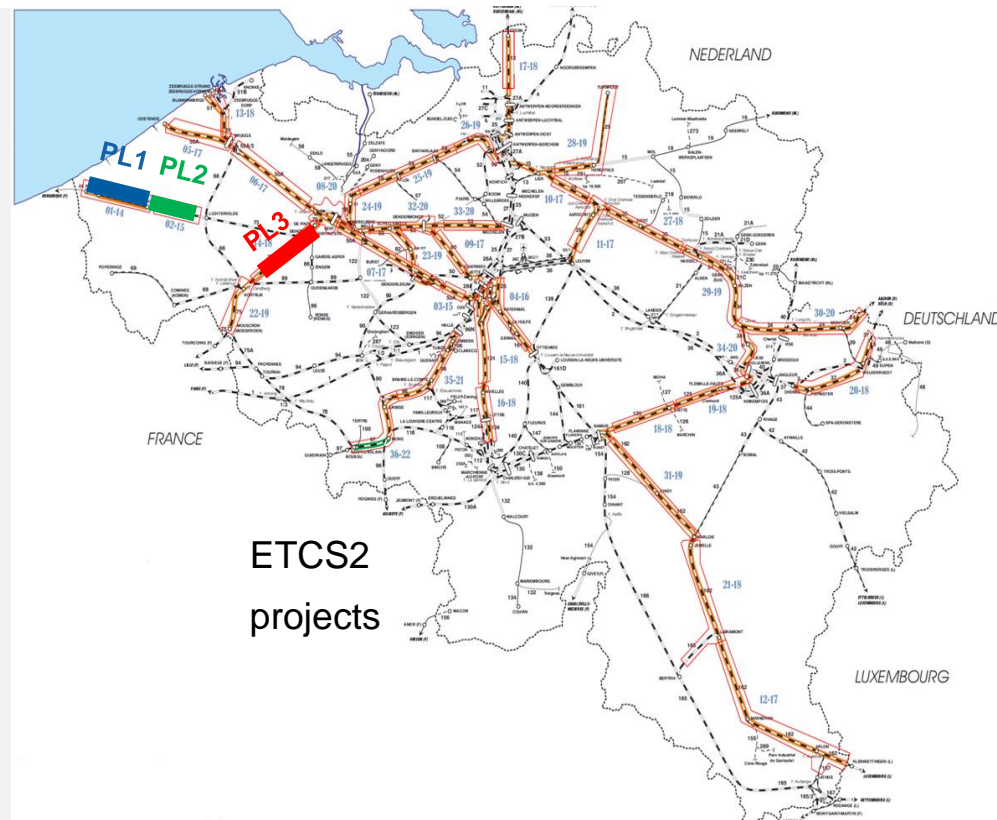
- **PL1** : ETCS2 only
- **PL2** : ETCS2 + simple IL
- **PL3** : ETCS2 + complex IL

### ETCS2

36 roll-out projects

### New Interlocking

31 roll-out projects





# 2

## Technical Development approach

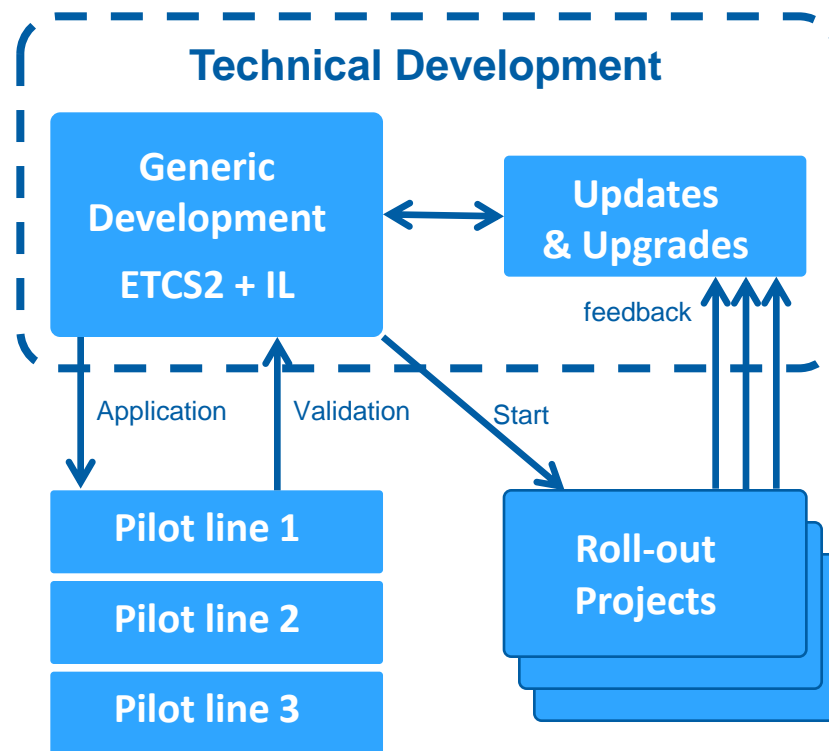
2. Technical development approach



**Technical development in the contract based on :**

- A generic development
- Application & Validation via pilot lines
- Updates/upgrades from roll-out

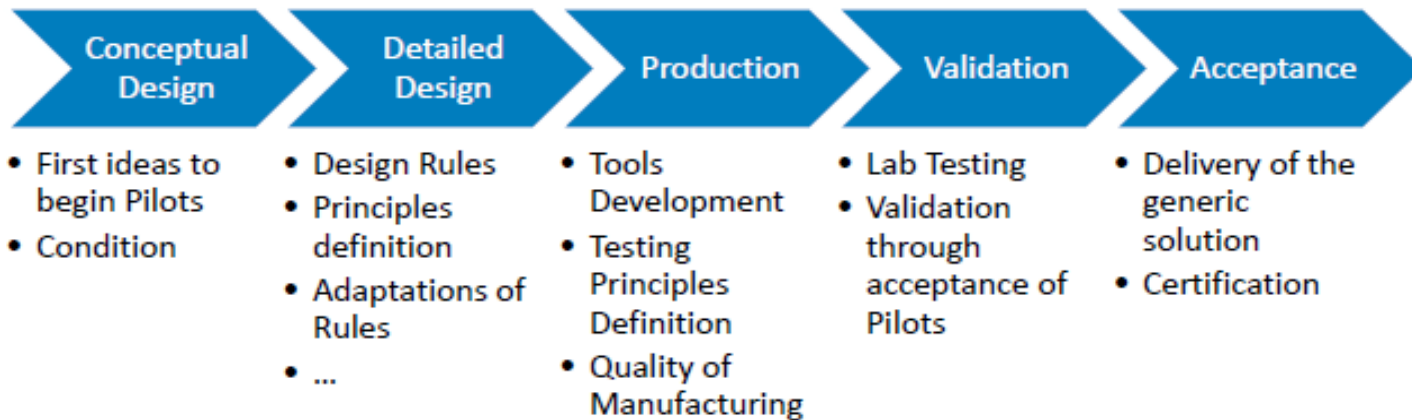
**Roll-out is based on this generic development (principles + process)**



2. Technical development approach



## Project Phases of the generic development







# 3

## ETCS2 Testing & Safety Strategy



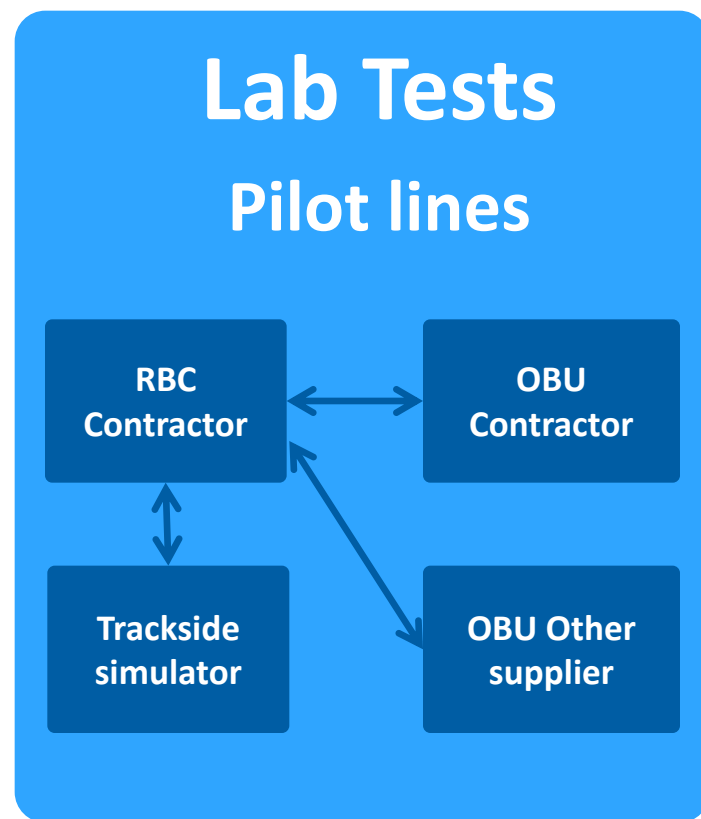
# Testing - Generic Development

## 1 Lab tests Contractor

**Generic development applied on pilot lines**

- Pilot lines configuration
- Lab Tests scenarios

Contractually, lab tests to be done with 2 different OBUs (diversity)



3. ETCS2 Testing & Safety Strategy

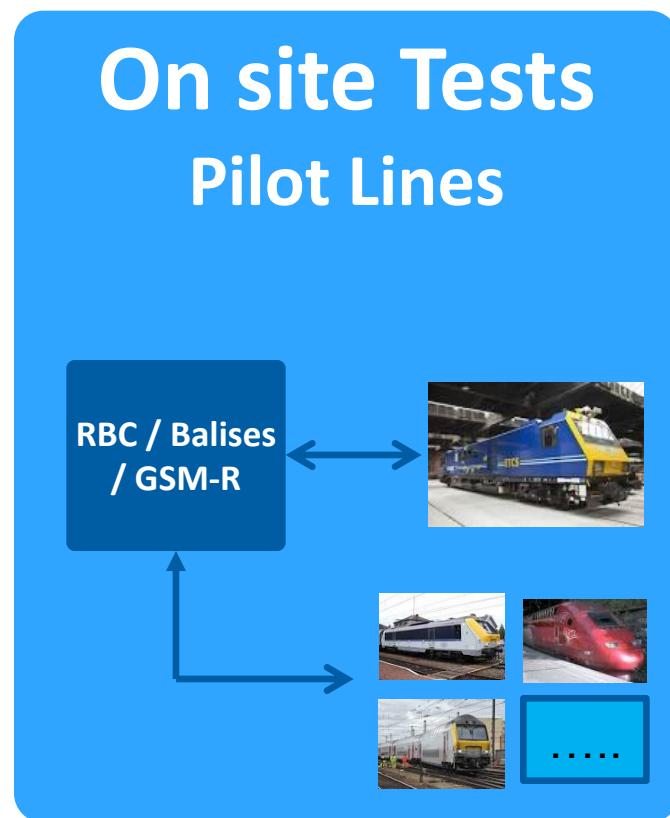
# Testing - Generic Development



## 2 On-site tests Contractor

- Pilot lines technically in service
- ETCS Test Train Infrabel
- On-site Tests Scenarios

Contractually, on-site tests to be done with 1 OBU, but on-site tests needed with existing OBUs for homologation



3. ETCS2 Testing & Safety Strategy

# Testing & Safety – Output Generic Development



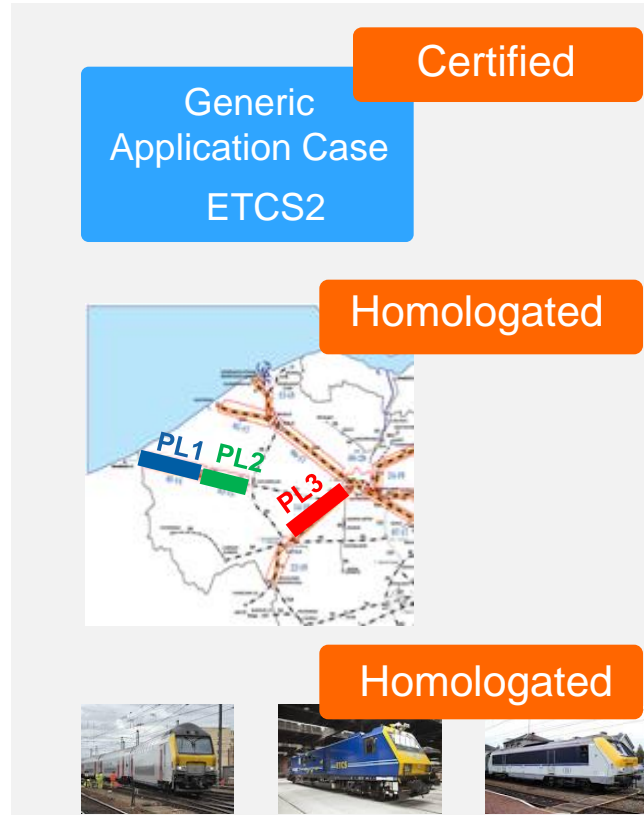
**Output of the generic development**

Generic Case ETCS2 validated, certified (GASC + ISA/No-Bo certificates)

- ready to start roll-out projects

Pilot lines homologated (SASC + ISA / No-Bo certificates)

OBUs (re)-homologated for ETCS2 conventional Network



3. ETCS2 Testing & Safety Strategy

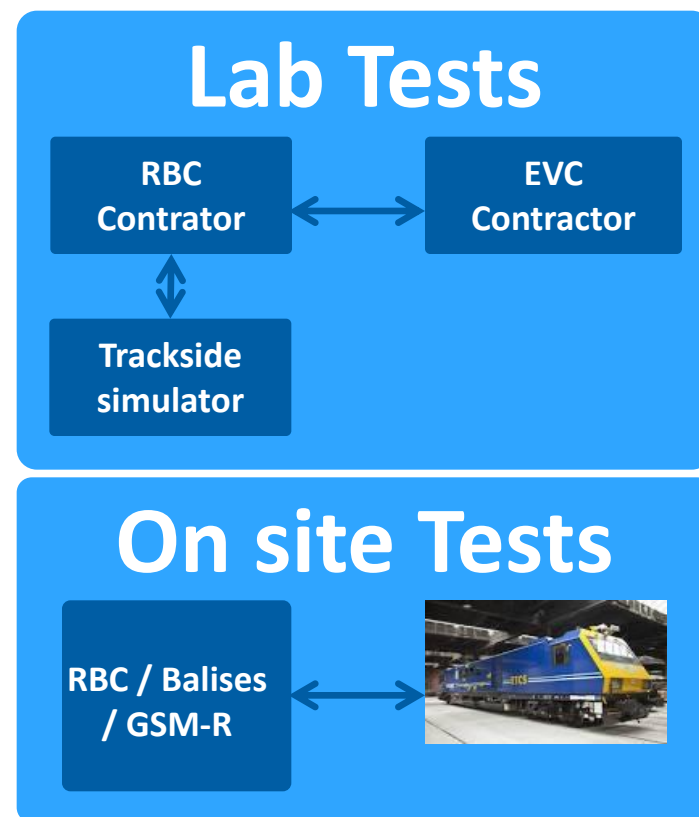
# Testing – Roll-out projects



**Project Specific Configuration based on Generic Case**

Test of the trackside configuration / installation.

- Lab tests : maximum of tests in lab + automatisation
- On-site tests : ETCS test train, limited to a minimum  
*No tests needed with other OBUs (except if new function)*



3. ETCS2 Testing & Safety Strategy



# Testing & Safety – Output Roll-out project

**Output of the roll-out tests for one project**

Specific project homologated  
(SASC + ISA / No-Bo certificates)

Feedback to adapt  
the Generic Case if necessary

**The same approach was followed on our ETCS1 Full Supervision deployment**

Generic phase + Pilot line :  
**3 years**

Roll-out 20 projects (1000 km track) :  
**4-5 years**

3. ETCS2 Testing & Safety Strategy



# Safety Strategy – Generic development and Roll-out

Safety strategy also based on 2 steps :

**1**

**Generic development**

Includes all safety analysis and evidences needed to get a “safe” and “Interoperable” ETCS2 production procedure (= ETCS2 Generic Case).

**2**

**Roll-out**

Includes mainly the evidences that the ETCS2 production procedure is followed on the specific project (via verification / validation / tests reports).

To increase the confidence level and certification / homologation in the defined planning it is important to regularly involve all Safety stakeholders : ISA / Notify Body / NSA during development and roll-out (monthly meetings).



# 4

## Infrabel ETCS Test Center

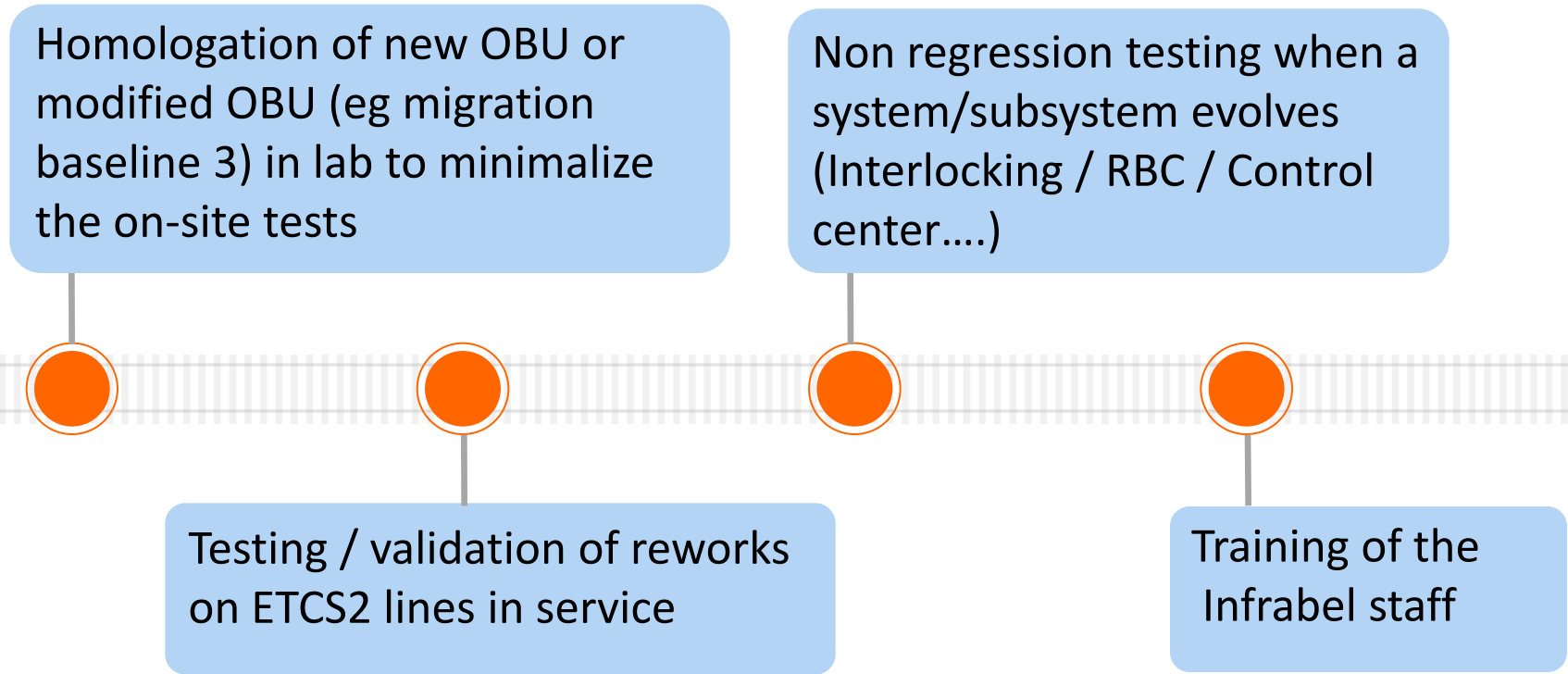


4. Infrabel Test Center



**The ETCS2 contractor will supply a lab test bench to Infrabel**

**Mid and long term objectives:**





# Conclusions

The Testing and Safety approach applied in the ETCS2 contract is based on the Infrabel ETCS1 experience.

This approach requires a lot of efforts during the roll-out on pilot lines to get a good and complete generic case but allows an **“industrial” deployment** by following **standard processes** afterwards.

This approach is quite challenging for the Contractor Siemens/Fabricom and Infrabel.





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**Thank you**