

CENTRO DE ESTUDIOS

Y EXPERIMENTACIÓN DE OBRAS PÚBLICAS



Remote testing of ETCS Operational Scenarios

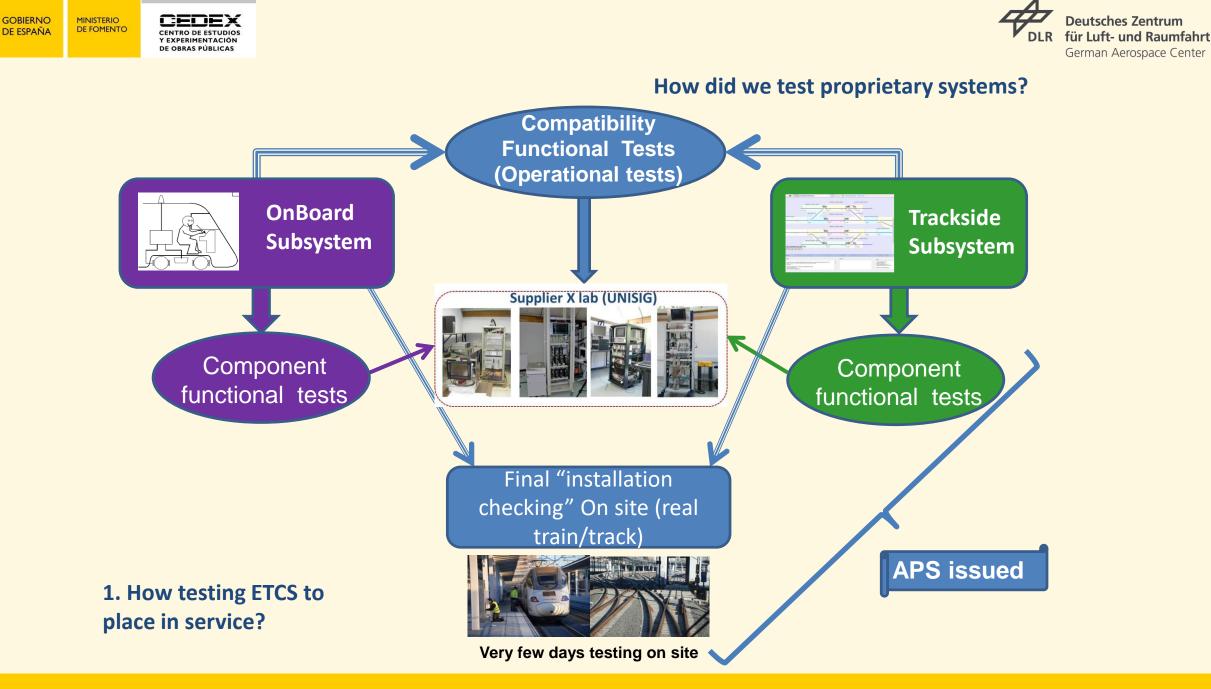
Michael Meyer zu Hörste Dr.-Ing. DLR Ignacio Jorge Iglesias Dr.- Ing. CEDEX

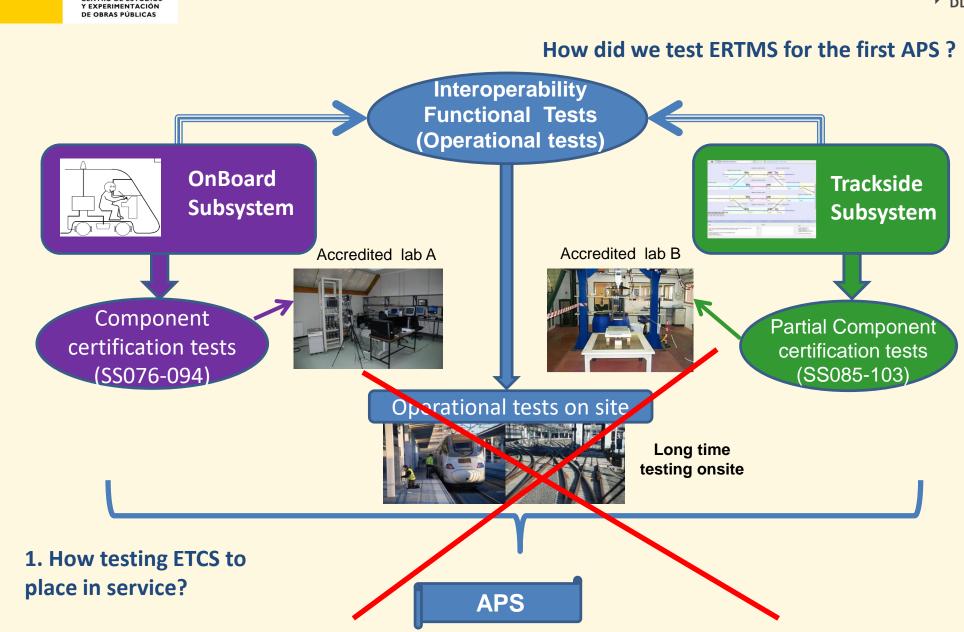




Summary

- **1. How testing ETCS to place in service?.**
- 2. How integrating the "real world" (real EVC and RBC) at lab
- 3. Remote testing
- 4. Cost and time saved by testing at lab
- 5. Conclusions.

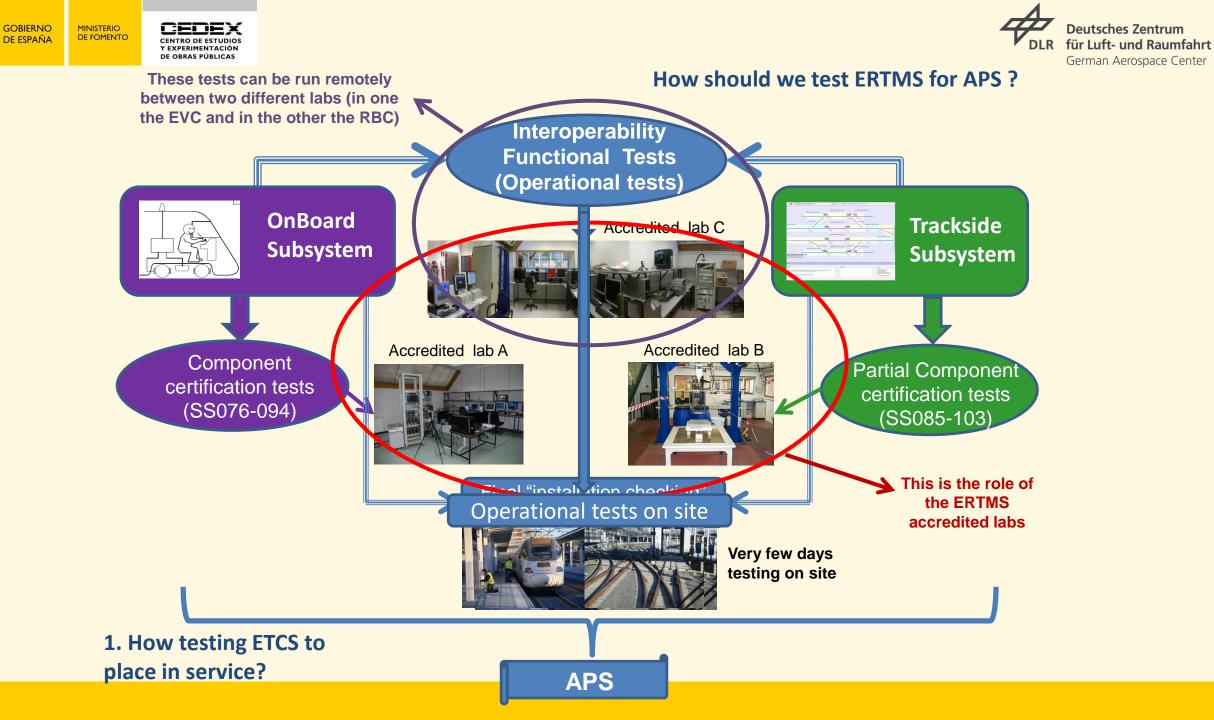




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Deutsches Zentrum DLR für Luft- und Raumfahrt German Aerospace Center







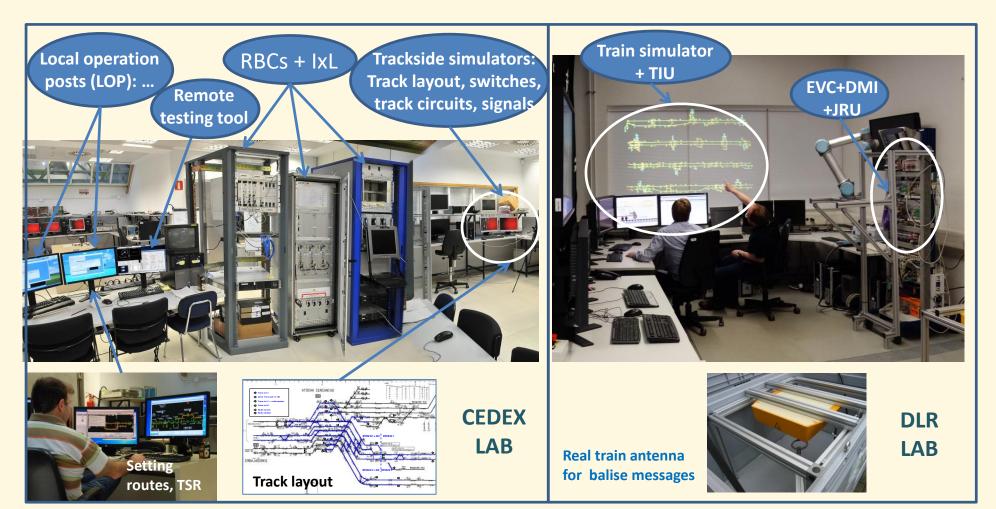
2. How integrating the "real world" (real EVC and RBC) at lab





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- Integration of both RBC and IxL (or IxL simulator) makes easier the interface between RBC (or IxL in this case) and the lab. (track circuits occupancy, aspect of the signals and status of the switches)
- In remote testing one lab integrates the trackside (RBC, IxL, LOP, trackside simulator and remote testing tool) an another lab integrates the on board (EVC, DMI, JRU, TIU, Train Motion Simulator and robot)
- HO between different RBC suppliers have been succesfully tested





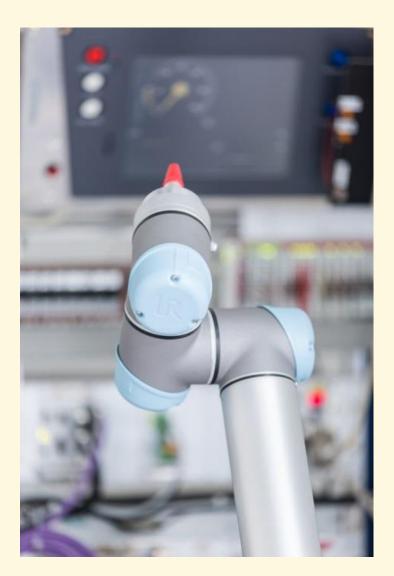


3. Remote Testing





3. Remote Testing

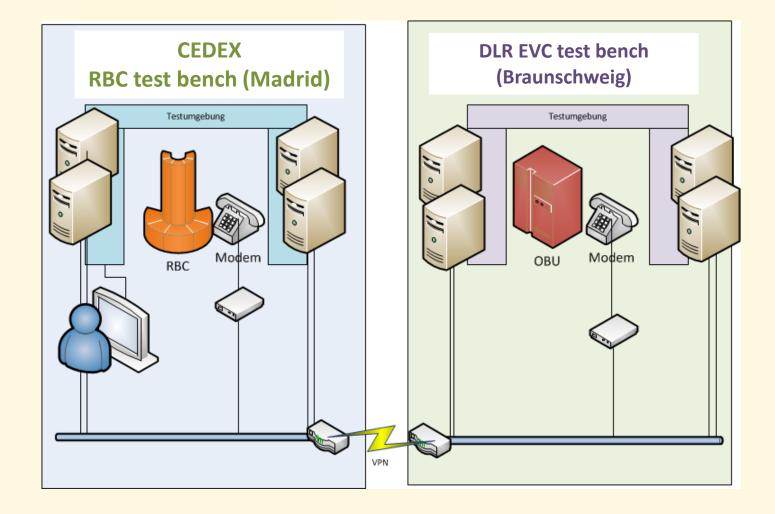


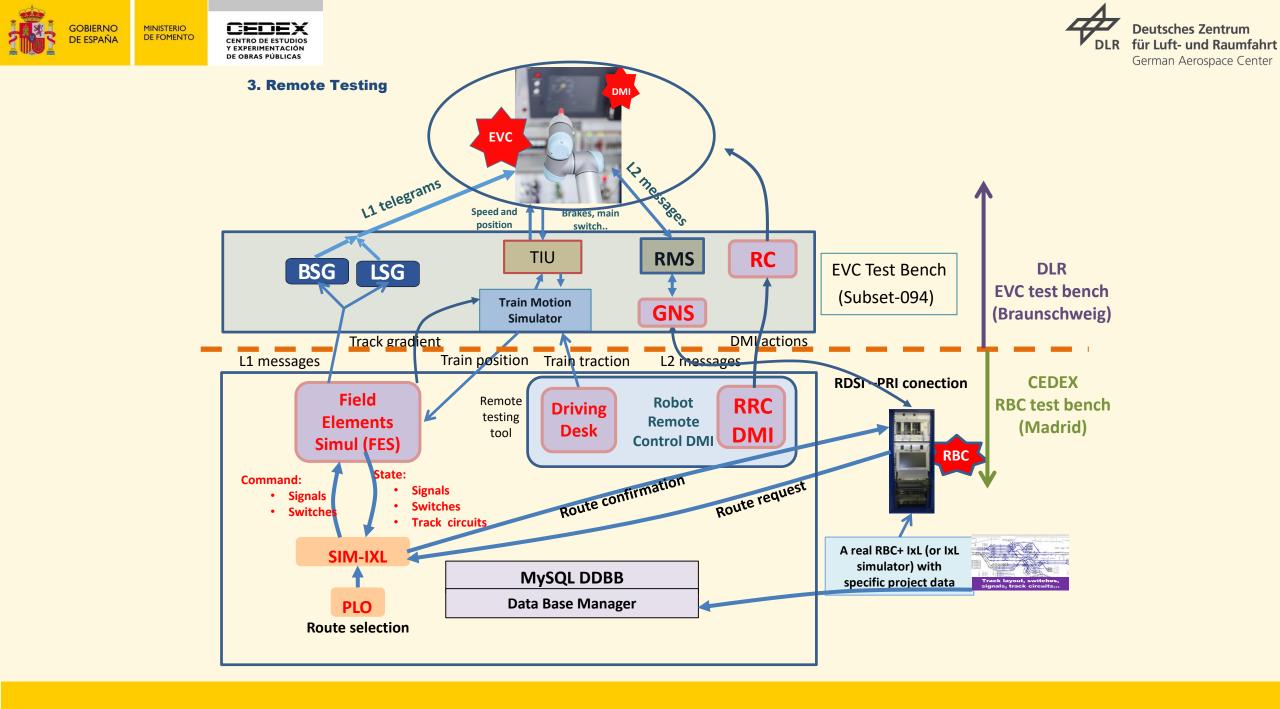
DLR DMI Robot controlled from CEDEX lab





3. Remote Testing







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3. Remote Testing



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Remote testing tool located at CEDEX lab (Driving desk)





4. Cost and duration reduction by performing Operational Tests on lab

Scenario . Test campaign with 3 OBUs	Cost (k€)	Duration (months)	Duration after construction end
1 Test campaign only on track	1,328	10,5	10,5
2Test campaign only at lab	180 (13%)	3	0
3 Test campaign first in the lab (debugging) and later on track	824 (62%)	5	2





5. Conclusions

- 1. Operational tests are needed to place in service a new ETCS train and/or line.
- 2. Performing those Operational tests at lab is the only way of saving time and approaching the process of ETCS placing in service to the process followed with old proprietary systems.
- 3. Remote tests allow testing together onboard and trackside subsystems located in different labs.
- 4. DLR and CEDEX performed these tests in 2015 with the OBU at DLR and the trackside L2 at CEDEX. Tests were totally operated from CEDEX premises in Madrid.
- 5. At the end of this year these remote operational tests will be used to check the backwards compatibility of EVCs BL3 running over L2 and L1 BL2 (2.3.0.d) lines.





Thank you very much for your kind attention

Michael Meyer zu Hörste Dr.-Ing. DLR Ignacio Jorge Iglesias Dr.-Ing. CEDEX