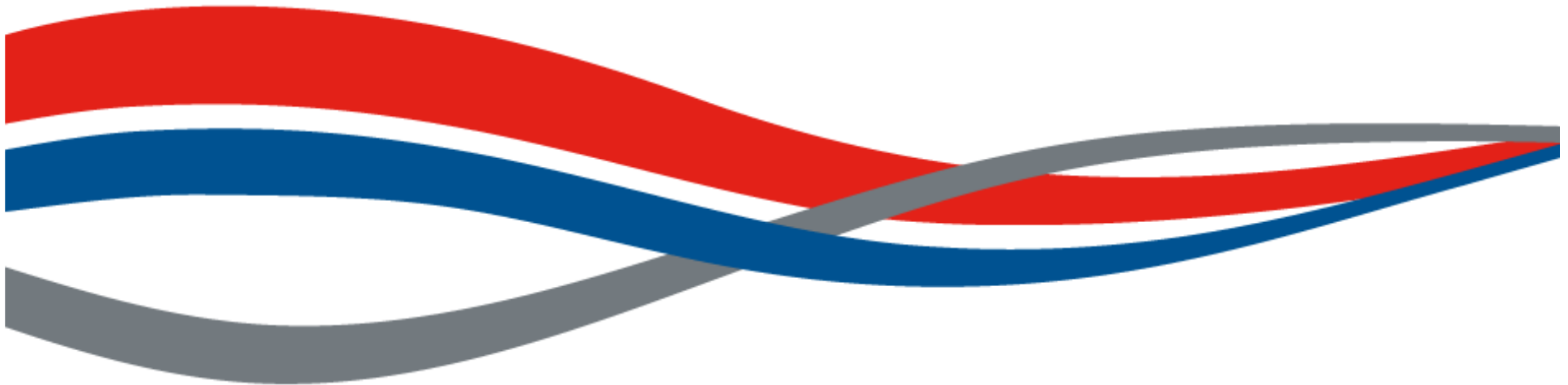


# Cambrian Lines ERTMS

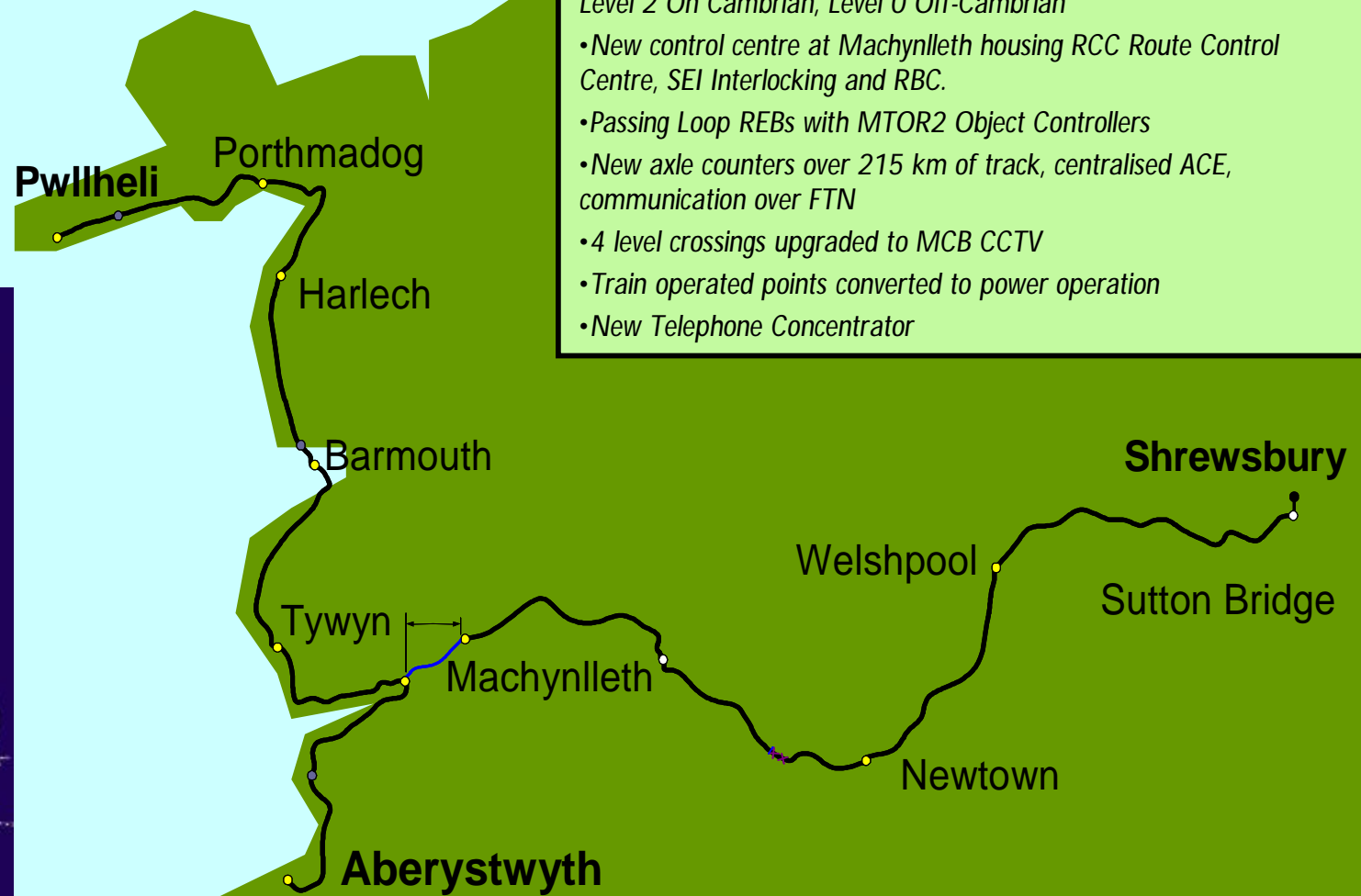
The Cambrian System

Jon Hayes - Ansaldo STS UK



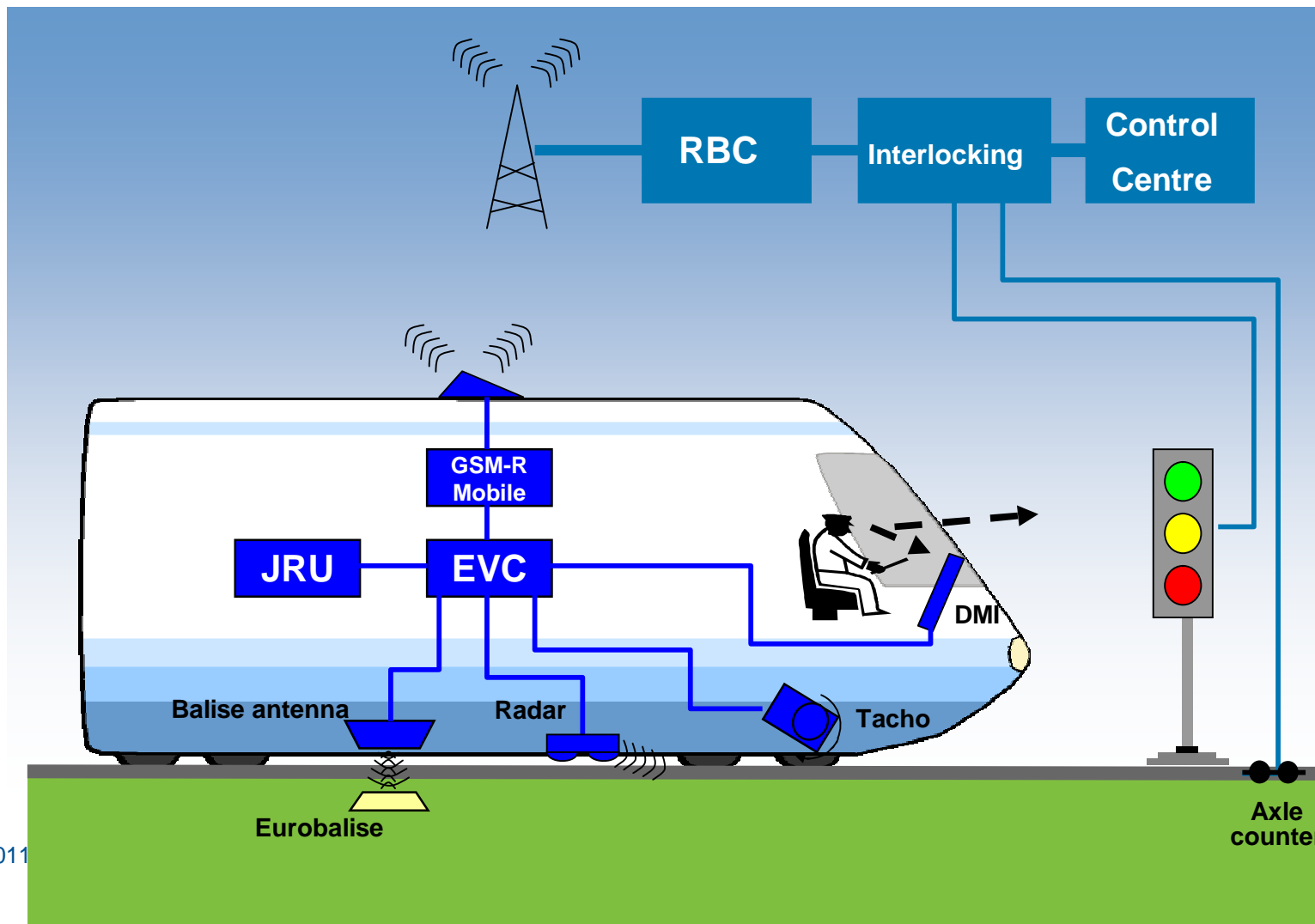
# Introduction of ERTMS to Cambrian Line

- 24x CI 158 DMUs + 3xCI 97 locos fitted with Ansaldo ERTMS – Level 2 On Cambrian, Level 0 Off-Cambrian
- New control centre at Machynlleth housing RCC Route Control Centre, SEI Interlocking and RBC.
- Passing Loop REBs with MTOR2 Object Controllers
- New axle counters over 215 km of track, centralised ACE, communication over FTN
- 4 level crossings upgraded to MCB CCTV
- Train operated points converted to power operation
- New Telephone Concentrator



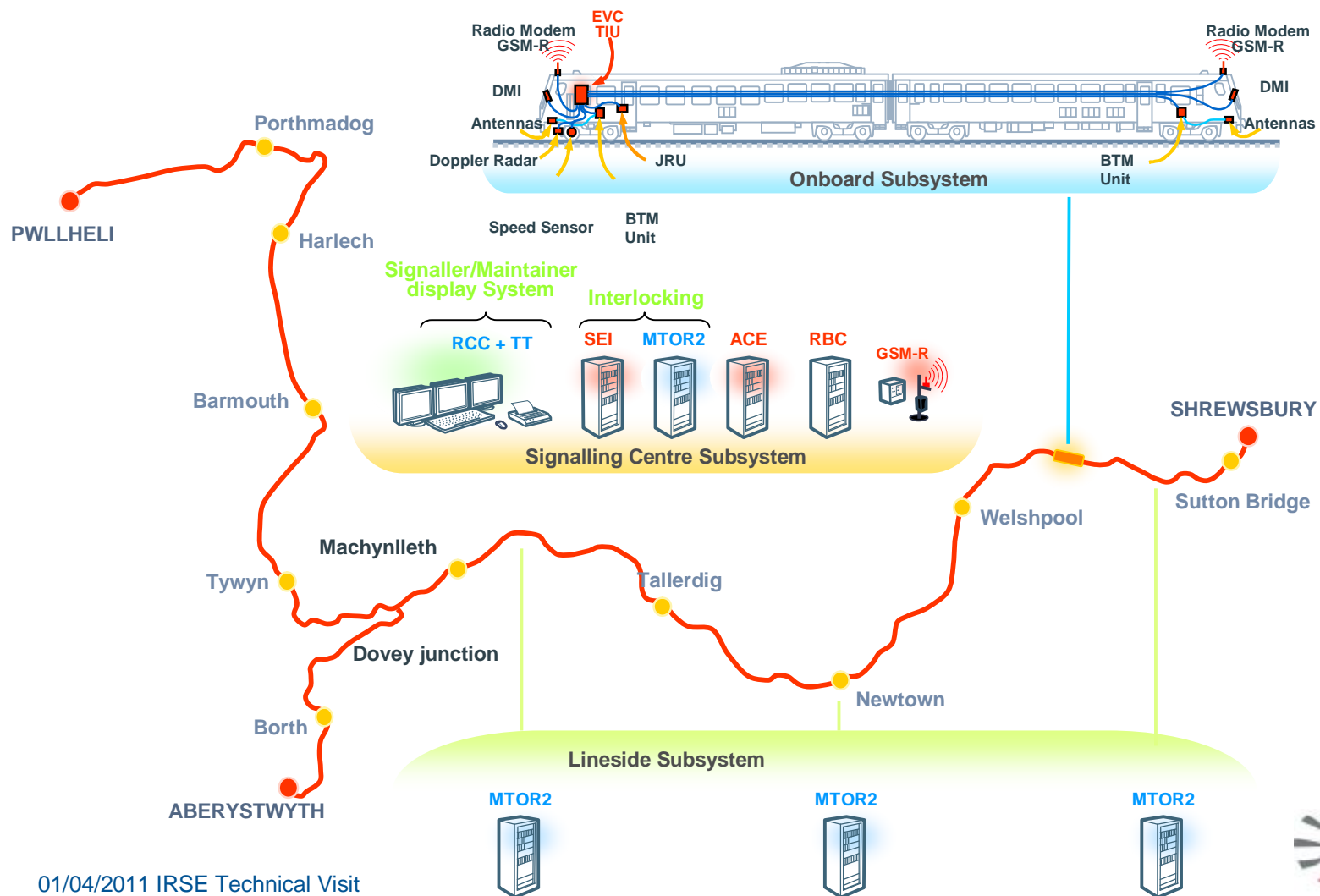


## ERTMS Level 2 Equipment



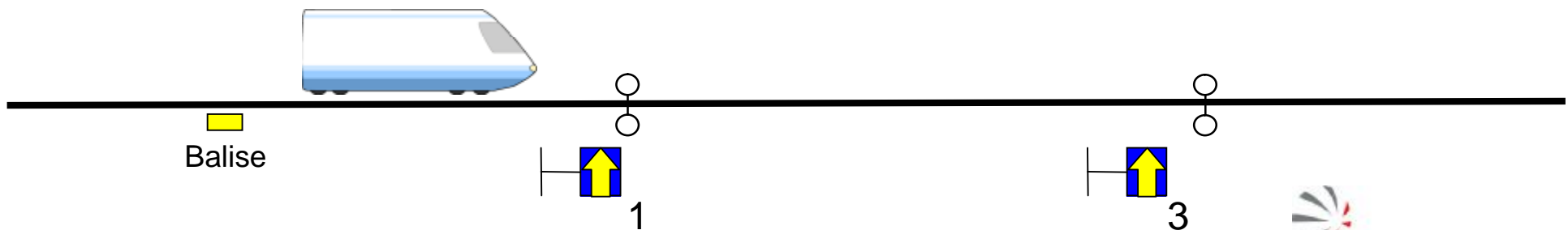
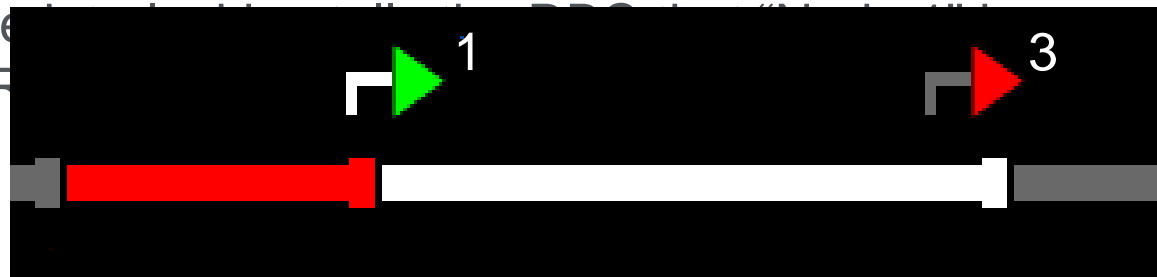
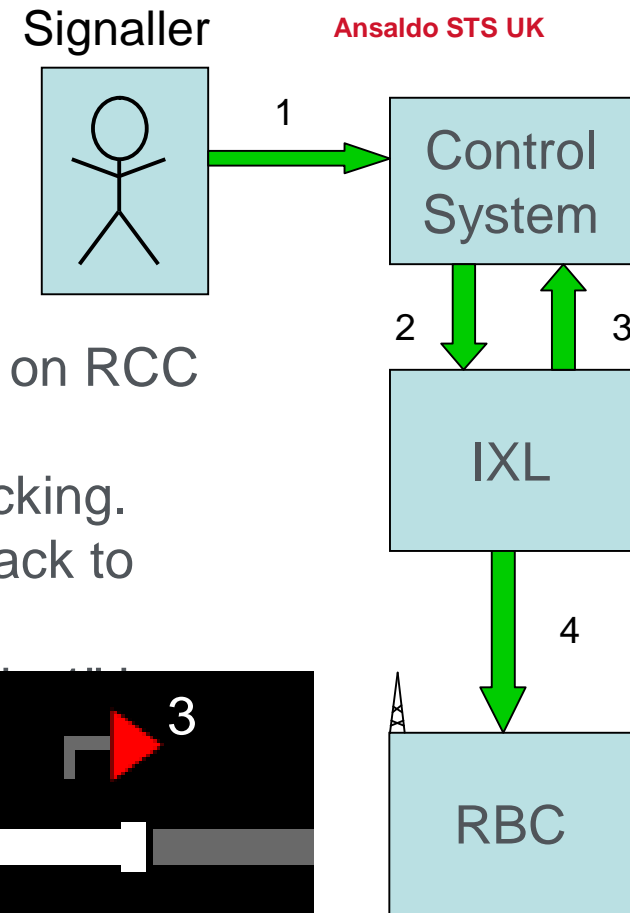
# Cambrian Technical Solution

## ERTMS level 2 schematic



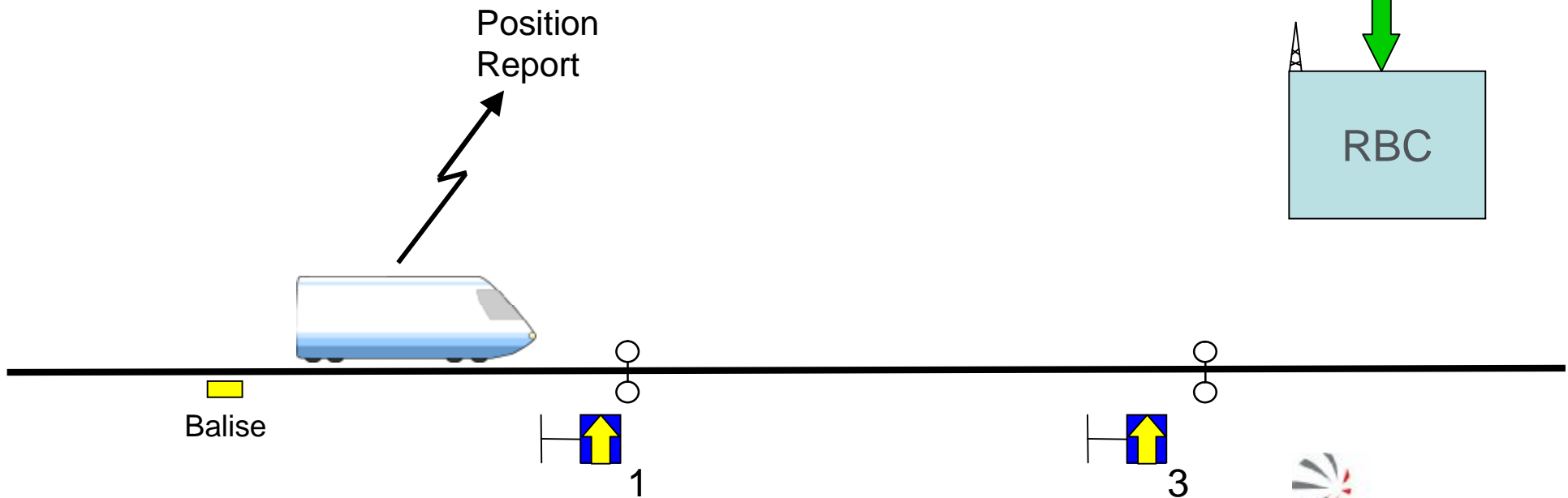
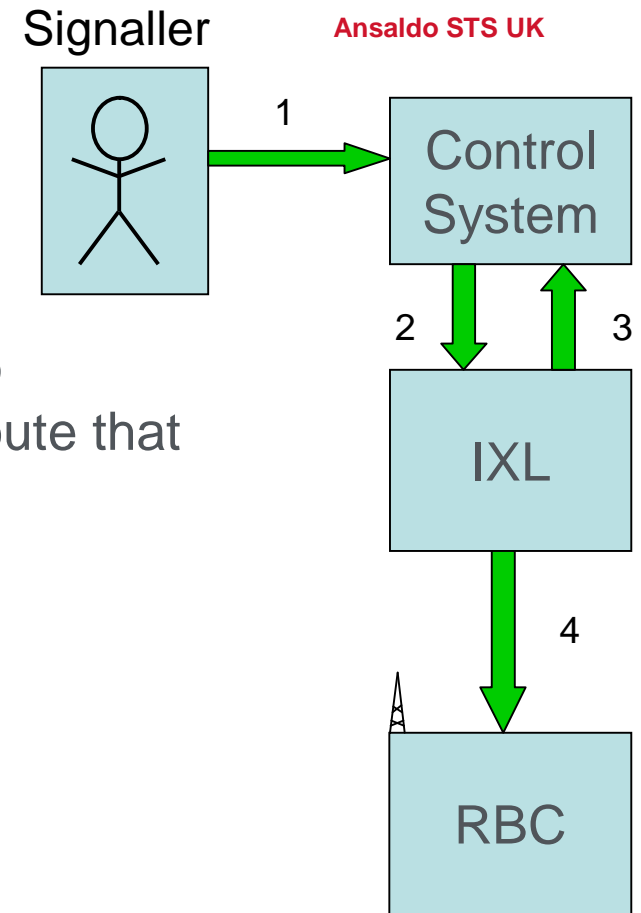
## ERTMS Level 2 – Basic Concept

1. Signaller requests route set from 1 to 3 on RCC control system
2. Route set request is sent to SEI Interlocking.
3. Once the route is set this is indicated back to the signaller via the RCC.
4. The route is set and the train is cleared to proceed.



## ERTMS Level 2 – Basic Concept

The RBC then uses train position reports to associate the appropriate train to the route that is set

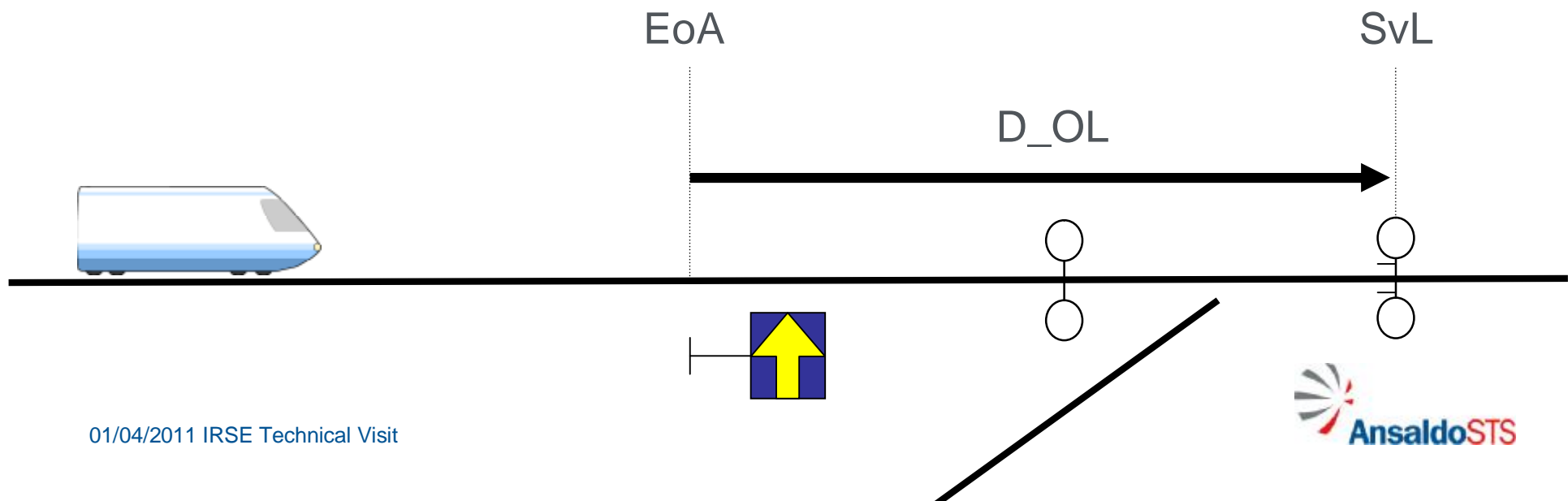


## ERTMS Level 2

### The End of Authority and the Supervised Location

The EVC determines the Supervised Location to be:

- 1. The end of the overlap (if an overlap is described in the movement authority)**
2. If no overlap described then the SvL is the Danger Point (if a DP is described in the movement authority)
3. If no Overlap or Danger Point is described, then the SvL is considered to be at the EoA.

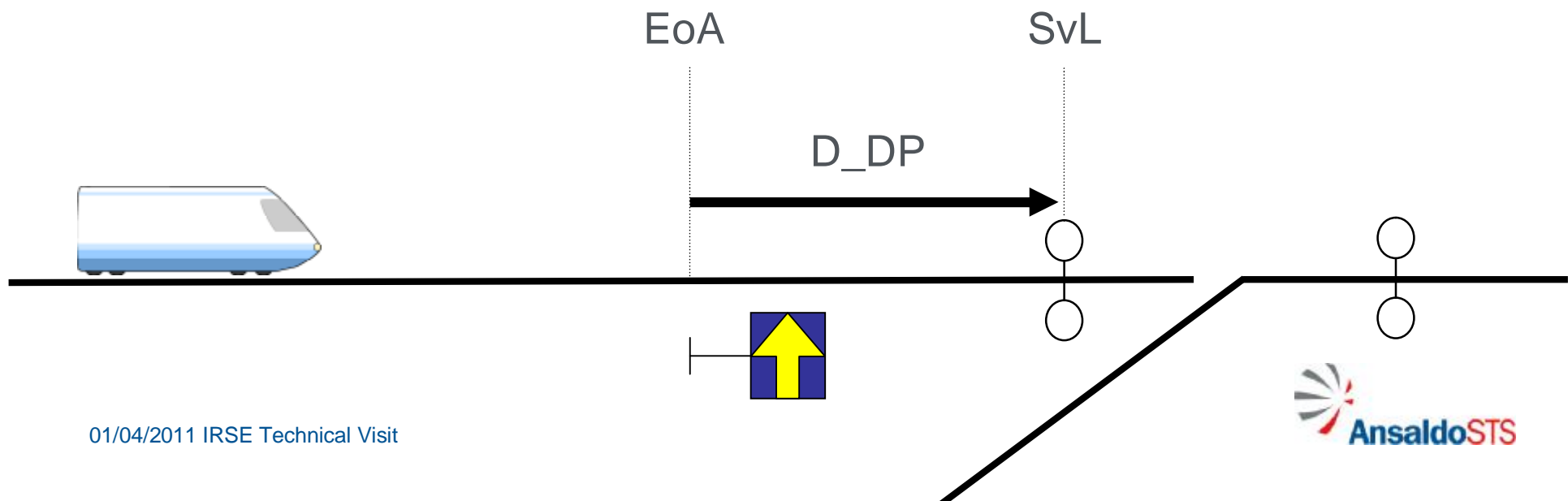


## ERTMS Level 2

### The End of Authority and the Supervised Location

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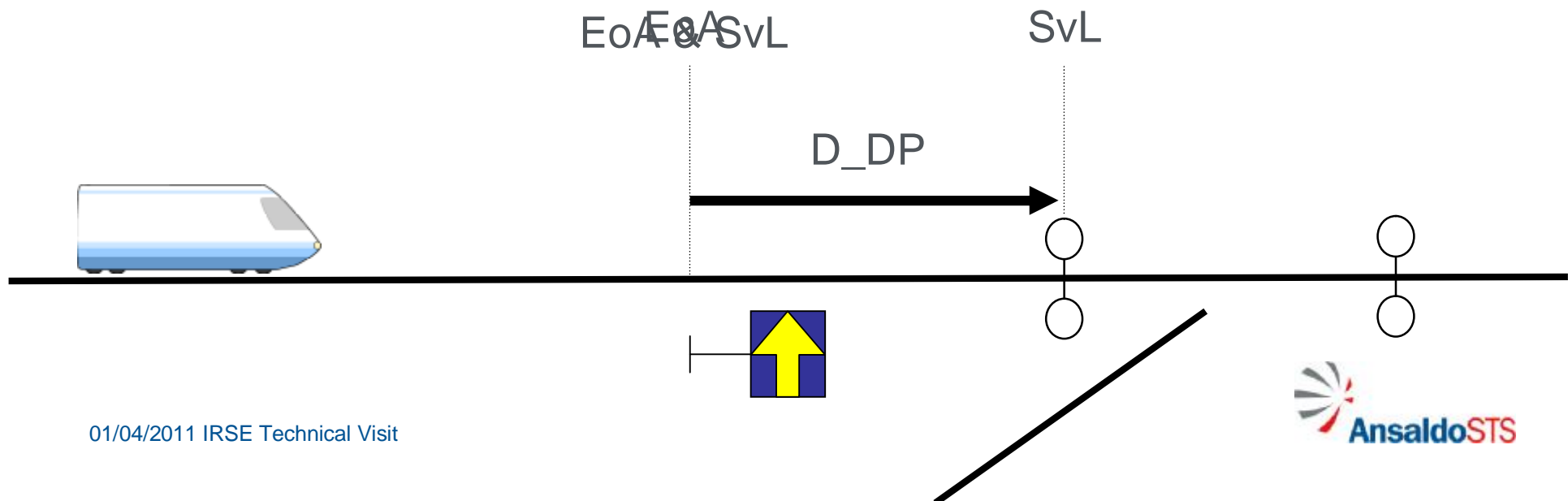


## ERTMS Level 2

### The End of Authority and the Supervised Location

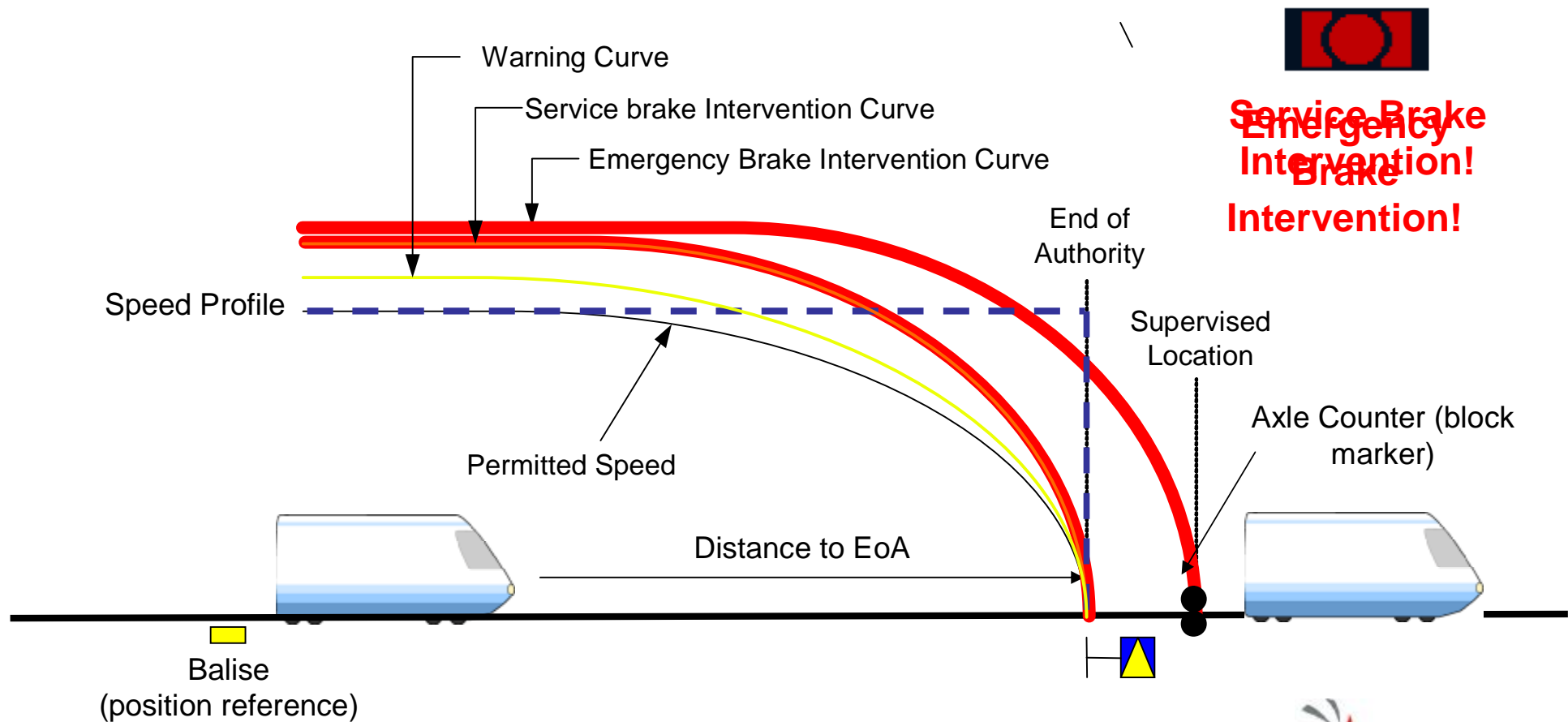
The EVC determines the Supervised Location to be:

1. The end of the overlap (if an overlap is described in the movement authority)
2. If no overlap provided then the SvL is the Danger Point (if a DP is described in the movement authority)
3. **If no Overlap or Danger Point is described, then the SvL is considered to be at the EoA.**



## ERTMS Level 2

### How does it work?



## Llanidloes Road



01/04/2011 IRSE Technical Visit

## Introduction of ERTMS to Cambrian Line - Class 37/97 Locomotive



01/04/2011 IRSE Technical Visit

## Introduction of ERTMS to Cambrian Line - Class 158 DMU Train



01/04/2011 IRSE Technical Visit