Signalling system solutions for secondary lines in 2015

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Content

- The current and forecasted situation on secondary railway lines
- The scope of the cooperation (objective and process) between the German Aerospace Centre and the University of Dresden
- Conclusion
The characteristics of secondary lines clarify the relative low operational requirements

Track characteristics of secondary railway lines

• Mostly single track (except stations)
• Mostly not electrified
• A lot of level crossings, mostly not protected by technical equipment
• Relative low track velocities
• Medium or low density traffic lines

The current and forecasted situation on secondary railway lines
Due to high costs the existence of many secondary railway lines is endangered.

Operations control and signalling systems in use

- overaged
- man-power intensive

High costs for operation and maintenance

The current and forecasted situation on secondary railway lines
To retain the profitability of a line often a system change is required.

The current and forecasted situation on secondary railway lines

- **Declining income**
  - Profitable
  - Unprofitable

- **Signalling costs (old system)**
  - Profitable

- **Signalling costs (new system)**
  - Profitable

- **System change**

**2015**
Due to the Liberalisation the complexity of the railway market increases

Effects of the Liberalisation:

- Change of state-owned into privately organised railway companies
- Separation of the train operation from the infrastructure management
- Increasing number of railway companies
- Rise of competition, rise of cost pressure

Policy / Customer

RO : Railway Operator
IM : Infrastructure Manager

The current and forecasted situation on secondary railway lines
Operation on low density lines can even be realised without any technical support

**Basic system solution:**

- Train order is controlled by an external train controller
- Field elements are controlled by vehicles
Low cost system approaches for the operations control:

- Different approaches for a technical support exist
- In German-speaking area at least 11 different systems are in use
- Single solutions
- No consistent approach
- Rare exchange of experiences
Objective of the cooperation

- Achievement of system approaches for an economical and safe operation of secondary lines
- Based on a consistent and systematical consideration of secondary lines
Within the process suitable approaches for system solutions will be identified.

**Process:**

1. **Structural analysis**
   - Secondary lines

2. **Trend analysis**
   - Specified secondary lines

3. **Clustering**
   - Forecasted development of secondary lines

4. **System approach**
   - Market segments
Process summary

- Analysis of the current and forecasted situation on secondary railway lines
- Derivation of the real existent requirements
- Identification of different market segments according to the requirements
- Identification of suitable system approaches for the market segments
Mobile on-board equipment

Effects:

- Decrease of costs due to reduction of track-side equipment
- Easier exchange of rolling stock between different infrastructure systems
Conclusion

- The existence of many secondary railway lines is endangered
- A reduction of operational costs is necessary
- The Liberalisation enforces the cost pressure
- A consistent approach is necessary to maintain secondary lines for the future (no single solutions)
- The introduced cooperation shall achieve system approaches based on a systematical consideration of the requirements on secondary lines
Thank You for your Attention!