Study on European Automatic Track Gauge Changeover Systems (ATGCS)

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How to overcome differences in track gauges?

- Change of track gauge
- Transhipment
- Exchange of bogie or wheelset
- Gauge-adjustable wheelset + changeover facility = automatic track gauge changeover system (ATGCS)
Currently there are four ATGCS
  - TALGO
  - CAF
  - DB Rafil
  - PKP SUW2000

Main differences
  - Technology
  - Type of traffic
  - ...
Different ATGCS 2

- Different ATGCS but one unique opportunity
  - to reduce total transport time
  - to avoid a source of damages
  - to increase transport reliability
  - to make railway transport more friendly to environment
  - to reduce transportation costs
Former UIC activities in this field

- 2002-2003 Study on defining a common infrastructure for ATGCS: TALGO, DB Rafil and PKP SUW 2000

Conclusions

- DB Rafil and PKP SUW 2000 are technically compatible and thereby ‘interoperable’
- Three systems are not compatible
- Development of common infrastructure possible – necessary modifications to both gauge-adjustable wheelsets and changeover installation
- NO simple, cost-effective solution at that time
A new UIC study proposal on comparative assessment of the European track gauge changeover systems was submitted by PKP to the members of CEEA.

CEEAA approved and developed proposal.

PTR Steering Body supported the proposal and decided to launch a feasibility study together with CEEA.
Why such a study?

- Are ATGCS represent modern technologies or kind of an experiment?
- Is application of these systems economically viable?
- What RUs (including new entrants) and IMs should know about ATGCS to decide whether to apply them or not
Scope of the study

- Comparative assessment of the European ATGCS
  - Technical characteristics
  - Scope of application
  - Experiences in operation
  - Directions of development – technical, legal
  - Guidelines

- Commercial aspects
  - Traffic flows
  - Types of traffic
  - ATGCS and alternative solutions
Objective of the study

- To compare existing ATGCS from the point of view of their optimum business utilization and performance in the specific areas in Europe and worldwide

- To promote newest technologies in the context of compatibility of different railway systems 1435/1520/1668
The first step – feasibility study

Two meetings of UIC working group – June, September 2007

- Poland (PKP, SUW 2000)
- Germany (DB, Rafil)
- Spain (CAF, Talgo, ADIF, RENFE)
- Lithuania (LG)
- Finland (VR)
- Slovakia (ZSR)
- Romania (CFR Marfa)

The final meeting – November 2007
First remarks 1
## ATGCS in passenger traffic (high speed)

<table>
<thead>
<tr>
<th>Variable gauge systems</th>
<th>Country</th>
<th>Max. speed (announced by manufacturer(s))</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUW 2000</td>
<td>Poland</td>
<td>160 km/h</td>
<td>No high-speed</td>
</tr>
<tr>
<td>DBAG/Rafil Type V</td>
<td>Germany</td>
<td>120 km/h</td>
<td>No high-speed: only for freight</td>
</tr>
<tr>
<td>CAF BRAVA</td>
<td>Spain</td>
<td>250 km/h</td>
<td>Started service $v_{\text{max}} = 250 \text{km/h}$ in 2005</td>
</tr>
<tr>
<td>Talgo RD</td>
<td>Spain</td>
<td>250 km/h</td>
<td>Currently in service up to 220 km/h</td>
</tr>
<tr>
<td>Japan RTRI</td>
<td>Japan</td>
<td>300 km/h</td>
<td>Top speed reached in tests 246 km/h</td>
</tr>
<tr>
<td>Korea KRRI</td>
<td>Korea</td>
<td>?</td>
<td>First results to be shown in 2008</td>
</tr>
</tbody>
</table>
First remarks 3

- Time savings – passenger traffic

![Bar chart showing time savings with two options: replace bogies in passenger cars and gauge-adjustable wheelset. The yellow bar represents the current time of 110 minutes per train, while the red bar represents the reduced time of 30 minutes per train.](image)
First remarks 4

- **Time & cost savings – freight traffic**

![Bar chart showing time and cost savings for various freight traffic operations](image)

- Handling of unit loads: 6.00 USD/ton
- Pumping from a tank car to a tank car: 40.00 USD/ton
- Pumping from a tank car to a container and then to a tank car: 70.00 USD/ton
- Replacement of bogies through lifting up car bodies: 20.00 USD/ton
- Replacement of bogies on a trapdoor: 5.00 USD/ton
- SUW 2000: 0.50 USD/ton

*Graph showing time of service in minutes for different operations.*
Conclusions

- Strong involvement of all concerned parties: railways and manufacturers of the systems
- A lot of data and information have been provided by participants so far
- The results of the feasibility study will be used to support the decision making process concerning launch of the main study in 2008
Thank you for your attention