



INTERNATIONAL UNION  
OF RAILWAYS

unity, solidarity, universality

Bidder

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Paris, 24 May 2012

“Automatic Gauge Changeover Systems” Project  
- Tendering for the execution of tasks as per 2012 programme of work -

Dear Sir/Madam,

As part of the *Automatic Gauge Changeover Systems* project, various investigations are to be conducted on the basis of a feasibility study. To this end, the organisations involved, UIC and OSJD, have created a Joint Working Group on Automatic Gauge Changeover Systems (JWG AGCS), which is to provide expert support and oversight for the work and which will assess and document the outputs. It has been decided that the execution of some of the investigations is to be tendered to third parties. Our letter of 9 March 2012 therefore announced that a public tender was to take place, and described the investigation tasks and the projected schedule for their completion.

Please find attached the full requirements, descriptions and expected outputs of the individual tasks.

Organisations or institutes in a position to execute these tasks may submit bids to UIC for separate tasks or for the “full package” of all the tasks. Bidders should note that if they submit a bid for all the tasks, they should structure the bid as if bidding for each task separately. The JWG AGCS<sup>1</sup> reserves the right to award successful bidders only selected tasks from the full package of tasks.

In submitting bids, the following information and proofs must be provided for each task:

- Confirmation of bidder’s ability to complete the work within the time frame via proof of existing capacity.
- Confirmation of bidder’s expertise and technical skills via verifiable references, execution of comparable investigations and/or certification.
- Delivery of investigation outputs in the languages used by the *JWG AGCS* (English and Russian) in the required format, in paper and electronic form, by the agreed deadlines

<sup>1</sup> Joint Working Group Automatic Gauge Change over Systems  
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- Written agreement concerning payment for the execution of task(s): approx. 30% following signature of contract, approx. 40% upon delivery of agreed outputs, and approx. 30% upon approval and acceptance of work by the *JWG AGCS*, as per the agreed timeline

Bids are to be sent to the following address in paper and electronic form and in English and Russian languages by 25 June 2012 (date of postmark or receipt by email):

**Union Internationale des Chemins de Fer (UIC)**  
**Department Rail System Rolling Stock Sector**  
**16, rue Jean Rey**  
**F-75015 PARIS**  
website: [www.uic.org](http://www.uic.org)

**UIC contact partner:**

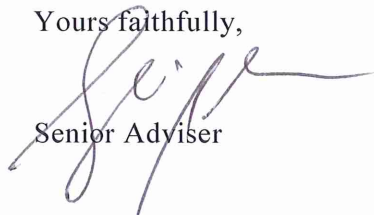
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In assessing the bids, the following factors will be considered: compliance with deadline, costs, qualifications, experience, and quality of the tender documentation submitted (languages, clarity).

The bids received will be assessed by a group of UIC/OSJD experts, which will then issue a recommendation concerning the award of the various tasks.

Contractual and fiscal aspects will be handled by UIC in accordance with French law, which will form the basis for the contracts.

Yours faithfully,



Senior Adviser

**Appendices:**

- Description of tasks 1 to 5

**Copy to:** *E. Maestrini, Director, Rail System Department, RSF "Rolling Stock" Sector*  
*M. Pineau (SNCF), Chairman of RSF Sector RS SET 06 "Running Gear"*

## Task 1

### “Documentation of existing automatic gauge changeover systems”

**Description:** Current gauge changeover systems are characterised by specific technical and operating features. Consultant must describe all existing gauge changeover systems (rolling stock and facility needed to change gauge) and users' experience. OSJD and UIC are going to provide available information concerning experience with the application of automatic gauge changeover systems. To complete the whole task, consultant must also search for information asking providers, other user not included in the UIC/OSJD joint group AGCS.

The report should contain:

- description of the complete systems,
- technical data on complete variable-gauge systems,
- type of traffic in which systems (freight, passenger)
- Users' experience of the various systems

**Aims:** Description of all existing and newly developed gauge changeover systems and practical experience with these systems, in a single document.

**Task:** Description of all existing gauge changeover systems and users' experience. The report should include a general description of the system, for which traffic the system works (freight/passenger) providing experience references.

For vehicles, the following factors should as a minimum be considered:

**Technical data:**

- Types of vehicles (wagons, coaches, EMU/DMU and locomotives)
- Description of the running gear device/bogie/wheelseets either motor or trailer
- Track gauges
- Running gear device/bogie/wheelseets masses and inertia moment
- Maximum speed circulating and passing through the facility
- Maximum speed of rolling stocks on free service track.
- Environmental conditions (ice, snow, etc.) and maximum operation temperatures for materials.
- Influence of snow and ice on operations
- Interchangeability with standard wheel sets
- Weight differential compared to standard wheel sets

**Functional data:**

- Is installation in standard bogies and running gear possible?
- What types of running gear are possible?
- Wheels displacement is performed while discharging the vehicle weight?
- Brake equipment configuration (e.g. including magnetic track brakes, block brakes, disc brakes) taking into account if the displacement of the brakes is manual or automatic.
- Coupler systems used for rolling stock equipped with AGCS (e.g. in case of the Polish system SUW 2000 the LAF double coupler system is applied that has got both a UIC screw coupler used in countries and a type SA-3 autocoupler used in countries with 1520/1524 mm track gauge).
- Experience with use in revenue service and factors for facilities (years and mileage run and number of gauge changes)
- Which system is used to detect hot box: the used of fixed hot box detection devices or on board system?

**Maintenance frequencies:**

- Description of locking devices (included systems that assure correct locking) fitted to the vehicle an object on the track impacts with the locking system.
- How can the locking system be checked?
- Is necessary to lubricate the system, either rolling stock or facility?

**For gauge changeover facilities, the following factors should as a minimum be considered:**

- Types of installation and which technologies can use each type of installation.
- Time taken for a full freight/passenger train to change gauge. In case of icing, running gear/wheelset/bogie, time needed to defrost (summer and winter conditions).
- Need of auxiliary equipments (for lubricating the track, for changing the position of the break, for de-icing equipment on variable-gauge wheelsets and running gear under in normal or severe conditions, for passing over gauge changeover devices
- Winter operations: is de-icing equipment required for the variable-gauge wheelsets/running gear prior to their passing over gauge changeover devices?
- Temperature at which gauge changeover devices are in operation at the borders between the 1435/1520 (1524) mm systems in eastern and northern Europe, and between the 1435/1668 mm systems in Spain

Safety and checking of variable-gauge wheelsets during/after gauge changeover

**Output:** Documentation in the shape of a report, "Description of existing automatic gauge changeover systems" in English and Russian, in electronic form.

**Appendix 1**  
to UIC letter of 24 May 2012

**Execution by:** External consultant with support from UIC/OSJD railways and users.

**Time frame:** 1 July – 30 October 2012, report November 2012

**Conclusion:** Presentation and approval by *JWG AGCS*, documented in minutes.

## Task 2

### “Market study”

**Description:** A market study is to determine market interest in rail transport services enhanced by automatic gauge changeover systems, given the requirements of various transport types. To do so, the decisive factors governing the use of these systems in freight, container and passenger rail services are to be identified, in order to determine what potential users are prepared to pay for shorter transport/transit times on routes with a gauge change (e.g. traffic with the Baltic and CIS states, and in/with Spain/Portugal). This information is to be used to estimate the likely cost-benefit ratio in a context of rising rail transport volumes attributable specifically to the use of gauge-changeover systems (effect of synergies).

**Aims:** Gather information assessing the likely cost/benefit of using automatic gauge changeover systems (effect of synergies) including as essential elements of interoperability and intermodality in the pan-European corridors.

**Task:** Conduct a study by sending surveys to freight companies, private wagon owners, shippers, logistics firms, manufacturers and traders. Analyse the results of the study and assess the commercial benefits. The surveys are to be analysed and assessed with a view to the commercial benefit.

**Output:** Produce an interim report (paper and electronic versions) and conclusions in English and Russian, detailing the effects of synergies and serving as preparation for an economic viability assessment.

**Execution by:** External consultant, with support from UIC/OSJD railways and users and help from the organisations UIC and OSJD.

**Time frame:** Time frame: 1 July – 30 October 2012, report October 2012

**Conclusion:** Presentation to and approval by JWG AGCS, documented in minutes.

## Task 3

### “Economic viability assessment”

**Description:** In an economic viability assessment what is relevant is not only cost, but also potential in terms of traffic flows and transport volumes at the interfaces between systems. In this context, the main cost drivers and the principal savings brought about by automatic gauge changeover systems are of significance. Of relevance to investment are indications of the cost-effectiveness periods' for gauge changeover devices and vehicles, in order to demonstrate (for example) the link between the additional costs per wagon and the cost-effectiveness periods' (worst-case scenario). Transport systems integration is also vital.

**Aim:** Determine the potential traffic and transport volumes at the system interfaces for freight and passenger trains, and on the basis of this data weigh up the commercial viability of the various types of transport in the light of the expected transport/traffic volumes.

**Task:** Assess the commercial viability of various systems, taking account of the current market and tariffs. In so doing, the following factors at least are to be considered:

- Wagon maintenance costs
- Specific costs for transshipment in service and change of gauge
- Number of gauge changeover operations
- Depreciation of an automatic gauge-changeover system
- Potential benefits due to reduced transit time
- Improved competitiveness for railways compared to other modes
- Potential benefit for operators and end users (passenger and freight trains)
- Show specific costs for vehicles and changeover devices

It is necessary to analyze the existing infrastructure used for cooperation of the railways with different track gauges, in order to identify their actual time of function. When one consider to launch reconstructive investments as indispensable a question arises, if to reconstruct the existing technology is justified in this case.

**Output:** Indication of the cost-effectiveness of a gauge changeover system, in the light of expected future traffic volumes in Europe and beyond.

Produce a report (in electronic form) on the commercial viability of various systems, in English and Russian.

**Appendix 3**  
to UIC letter of 24 May 2012

**Execution by:** External consultant, with support from UIC/OSJD railways and users and help from the organisations UIC and OSJD.

**Time frame:** 10 July 2012 – 28 February 2013, interim report 3 Oct. 2012, report Febr. 2013

**Conclusion:** Presentation to and approval by JWG AGCS, documented in minutes.



## Task 4

### “Approval procedure”

**Description:** For traffic crossing several systems the vehicles must comply with the regulations set by UIC and OSJD in planning, design, testing and manufacture. In international traffic wagons and coaches must meet the safety requirements of the UIC and OSJD codes, EU standards, the standards of railways with a 1520 mm gauge and other relevant international rules and regulations. In this context, the technical and operational prescriptions of UIC (series 400 / 500) and OSJD (.....), as well as EU rules (TSIs, ENs) and the rules and state of art in countries with experience in automatic gauge changeover systems (Spain ETH's, etc) should be taken into account.

In order to reduce the time (and associated cost) required for approval and certification between countries, procedures are to be developed which enable facilitated or harmonised approval/certification.

**Aim:** Reduce the costs and time of approving and certifying wagons, coaches, EMU/DMU, and locomotives fitted with automatic gauge changeover devices to operate on networks with different track gauges.

**Task:** Analyse the approval and certification procedures for rolling stock fitted with automatic gauge changeover devices and the automatic gauge changeover facilities, and develop proposals for a harmonised approval procedure.

As a minimum the following factors require consideration:

**A.** Which are the bodies or authorities responsible for the approval of wagons and coaches with automatic gauge changeover technology and gauge changeover installations in the UIC and OSJD areas?

**B.** What are the supporting documents required by these approval bodies?

- drawings, calculations, tests

**C.** The proposal for the rolling stock approval procedure should take into account at least these points:

- Types of vehicles (wagons, coaches, EMU/DMU, and locomotives), axle load and velocity
- Different track gauges
- Rolling stock construction gauge and kinematic gauges
- Service temperatures

- Information on the climatic conditions of use
- Demonstrated noise levels
- The vehicle behaviour in each different gauge, in accordance with UIC and OSJD rules
- Locking systems. Safety measures, monitoring of wheel position, status check, p. p.
- Braking systems. Secure lock of braking system, monitoring, p. p.
- Hot box detect
- The Marking of vehicles
- Maintenance requirement
- Calculations (strength, fatigue, life, wear) of elements and mechanisms
- Bench Testing
- Necessary tests to put in service the vehicle
- RAMS

D: The proposal for the automatic gauge changeover facilities should take into account at least these points:

- Types of facilities
- Electrification systems
- Safety installations and communications
- Signalling systems and relation between interlockings.
- Maintenance requirement
- Auxiliary facilities

Tests to put in service the facilities.

On the basis of the analysis one should develop proposals for a harmonised approval procedure.

Taking into consideration the analysis performed, one should identify which certifying institution in the UIC countries area and in the OSJD countries area are entitled to run approval tests and issue approval certificates (a catalogue). Opportunities of mutual acceptance in full or a part of these tests and certificates have to be indicated, while use of harmonised approval procedures by the institutions in the whole UIC/OSJD countries area as a target goal.

**The standards and leaflets governing the following subjects in the UIC and OSJD areas are to be documented:**

- Calculations for all running gear components, e.g. bogie frame, variable-gauge wheelsets, axles, wheels, locking device parts, axle boxes, etc.
- Strength conditions for wagons, running gear, and wheelsets
- Bench tests for all vehicle and wagon components

- Execution of service tests

**Test centres and certification:**

- Index and certification of test centres
- Authorised test centres able to conduct the required tests for various track gauges
- Procedure for the acceptance of designs and series vehicles

UIC/OSJD recognition of approval certificates.

Those points specific to wagons only or coaches only are to be distinguished

**Output:** A report in English and Russian in electronic format with proposals for adapting and amending operational and technical standards and leaflets (UIC/OSJD and EN).

**Execution by:** External consultant, with support from UIC/OSJD railways and users:

**Time frame:** 12 July - 30 January 2013, interim report 3 Oct. and 11 Dec. 2012

**Conclusion:** Presentation to and approval by JWG AGCS, documented in minutes:

## Task 5

### “Ecological aspects and environmental concerns”

**Description:** Environmental protection is being accorded increasing priority. This applies principally to the carriage of dangerous chemicals and liquids, which either cannot or, if possible ought not, be transhipped. The risk of damage being caused during transshipment can be reduced significantly by avoiding transshipment altogether, a considerable boost to the quality and attractiveness of automatic gauge changeover technology.

**Aim:** Reduce the environmental impact of rolling stock and transport by using automatic gauge changeover systems.

**Task:** Investigation and comparison of ecological risks and evaluation of ecological advantages with use of automatic gauge change systems of rolling stock to the track with other gauge with the existing technologies.

It is necessary to investigate impact on the environment of the technology of automatic gauge change to the track with other gauge and ecological benefits in comparison with the existing technologies.

It is also to be investigated what measures are required when in order to avoid irregularities during automatic change of gauge.

**Output:** Produce a sustainability report in English and Russian, in electronic form.

**Execution by:** External consultant, with support from UIC/OSJD railways and users.

**Time frame:** 1 Aug. 2012 – 30 January 2013, interim report 3 Oct. and 11 Dec. 2012

**Conclusion:** Presentation to and approval by JWG AGCS, documented in minutes