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Item 5 (c) of the provisional agenda

European Agreement on Important International Combined Transport Lines and Related Installations

Working Party on Rail Transport

Sixty-fourth session

Vienna, 18–19 November 2010

Item 2 (c) of the provisional agenda

European Agreement on Main International Railway Lines

Amendment proposals (minimum infrastructure and performance standards)

Review of the technical characteristics of the AGC and AGTC rail networks

Note by the secretariat in cooperation with an informal ad hoc expert group

I. Mandate

1. Activity 02.5 “Rail Transport” of the 2010–2014 work programme of the Inland Transport Committee specifies under activities (a) and (b) that the Working Party on Rail Transport should continue to consider the AGC Agreement “... with a view to possibly implementing and, whenever feasible, improving existing standards and operational parameters; ...” and to “review the coherence between the AGC parameters and infrastructure standards established by competent authorities of the European Union (EU) and consider the feasibility of harmonizing them over the longer term.” (ECE/TRANS/2010/8).

2. Activity 02.9 “Intermodal Transport and Logistics” of the 2010–2014 work programme of the Inland Transport Committee stipulates under activity (a) that the

Working Party on Intermodal Transport and Logistics should pursue “(iii) reviewing and, whenever feasible, improving existing infrastructure standards and performance parameters of the AGTC Agreement with a view to raising interoperability and establishing benchmarks;” (ECE/TRANS/2010/8).

3. These activities are part of a larger review that also encompasses the AGTC performance standards, including:

- Transshipment procedures in terminals as well as mechanisms for their optimum location and construction (programme activity (a) (iv));
- Capacity and efficiency of port hinterland transport (programme activity (a) (v));
- Environmental, energy, safety and security standards (programme activity (a) (v)).

4. This work, to be undertaken between 2011 and 2013, should lead to the preparation of a comprehensive package of amendment proposals that would update the AGC and AGTC Agreements and bring them in line with modern railway and intermodal transport requirements applicable at the pan-European level.

II. Background

5. In March 2005, the Working Party on Intermodal Transport and Logistics considered the results of a secretariat survey on the relevance of existing infrastructure and performance standards as well as target values contained in the AGC and AGTC Agreements (TRANS/WP.24/2005/5). The replies from 15 countries showed that a number of such standards might need to be reviewed and possibly substituted by benchmarks that better reflect today’s requirements for efficient rail and intermodal transport services.

6. With a view to analysing the coherence between the various rail and intermodal infrastructure and service parameters and to examining, if necessary, their harmonization in the longer term, the Working Party felt that it was of particular importance to cooperate with the relevant railway groups within UNECE and the (then) ECMT as well as with the competent authorities within the European Union dealing with rail infrastructure standards (TRANS/WP.24/107, paragraphs 13 and 14).

7. In March 2009, the Working Party requested the secretariat to solicit the views of rail infrastructure managers, terminal operators and railway undertakings in order to obtain a comprehensive picture of the proposed size and range of standards and parameters for existing and new railway lines of the AGC and AGTC networks as well as for related installations contained in the AGTC Agreement. Once these data were available, the Working Party decided to consider these standards and parameters in cooperation with the Working Party on Rail Transport and to prepare appropriate amendment proposals to the AGTC Agreement (ECE/TRANS/WP.24/2009/2; ECE/TRANS/WP.24/123, para. 60).

8. Following these consultations, the secretariat in cooperation with an informal ad hoc expert group has prepared the present document on *technical characteristics of the AGC and AGTC rail networks* for consideration by the Working Parties on Rail Transport and on Intermodal Transport and Logistics.

9. Another document, also prepared by the secretariat in cooperation with an informal ad hoc expert group, contains an overview of the minimum *performance standards for combined transport trains and related installations as addressed in the AGTC Agreement* for consideration by the Working Party on Intermodal Transport and Logistics (ECE/TRANS/WP.24/2010/3).

III. Objectives

10. The AGC¹ and AGTC² Agreements were adopted in the 1990s as a pan-European legal framework that lays down a co-ordinated plan for the development and operation of railway and combined transport lines, services and related installations based on internationally agreed performance parameters and standards.³

11. The AGC and AGTC Agreements identify so-called E- and C-E rail networks as well as installations important for international combined transport that are to be developed by countries within the framework of national programmes and in accordance with their respective legislations. The technical characteristics of these networks should conform to the standards set out in the AGC and AGTC Agreements or should be brought in conformity with these standards in future improvement work to be carried out in conformity with national programmes.

12. The objective of the present review is to examine the technical infrastructure characteristics stipulated in the AGC and AGTC Agreements and, if necessary, bring them in line with modern requirements. This does not necessarily require the establishment and agreement on detailed technical standards, but could be confined to the identification of minimum requirements that constitute the basis for the efficient and safe movement of goods and passengers on the AGC and AGTC pan-European rail networks.

13. This review thus embraces the railway lines of countries in the European Union, Eastern and South-Eastern Europe, Central Asia and the Caucasus. It also includes technical characteristics contained in the Trans-Asian Railway Network (TAR) that links the AGC and AGTC rail networks with those of the Asia-Pacific region.

14. On the basis of a comparison of the basic technical rail infrastructure characteristics established in various instruments, UNECE member countries and Contracting States to the AGC and AGTC Agreements may wish to update and complement the existing standards and parameters in the AGC and AGTC Agreements.

15. The revised and updated AGC and AGTC Agreements would then continue to provide the framework for the harmonized development of modern railway and combined transport networks and services at the pan-European level, and provide a link between the rail systems of UNECE member States with those of the Asian and Pacific region.

16. This approach is fully in line with the objectives of UNECE activities in the field of transport, which aim at facilitating international rail transport at the pan-European level and at improving safety, environmental protection, energy efficiency and security to levels that contribute effectively to sustainable development.

¹ European Agreement on Main International Railway Lines (AGC)
<http://www.unece.org/trans/main/sc2/sc2_AGC_text.html>.

² European Agreement on Important International Combined Transport Lines and Related Installations (AGTC) <http://www.unece.org/trans/wp24/AGTC_text.html>.

³ The term “combined transport” used in the AGTC Agreement has been replaced in activities of the UNECE by the term “intermodal” transport. While these terms are not synonymous (as defined by the UNECE, ECMT and EC) they are meant to describe the movement of goods in one and the same loading unit or road vehicle, which uses successively two or more modes of transport without handling the goods themselves in changing modes. The AGTC Agreement addresses road-rail transport operations whereas the Inland Water Protocol to the AGTC Agreement focuses on intermodal transport operations on inland waterways
http://www.unece.org/trans/wp24/Protocol_text.html>.

IV. Technical characteristics of railway networks

17. The annex to the present document contains an overview of the technical characteristics of railway lines as contained in

- (a) Annex II of the AGC Agreement;
- (b) Annex III of the AGTC Agreement;
- (c) Technical Specifications of Interoperability (TSI) applicable in the European Union (EU) for high-speed rail (HS);⁴
- (d) Technical Specifications of Interoperability (TSI) applicable in the European Union (EU) for conventional rail (CR) systems;⁵
- (e) Intergovernmental Agreement on the Trans-Asian Railway Network (TAR);⁶
- (f) UNECE Trans-European Railway (TER) Project;⁷
- (g) European Railway Technical Strategy of European Rail Infrastructure Managers (EIM);⁸
- (h) FERRMED standards;⁹
- (i) 2005 UNECE secretariat survey.¹⁰

V. Work to be done

18. The Working Parties may wish to review the existing technical characteristics of the AGC and AGTC Agreements and decide on appropriate modifications, deletions or additions.

19. On this basis, the secretariat could draft amendment proposals to the AGC and AGTC Agreements that, in accordance with Article 12 of the AGC Agreement and Article 16 of the AGTC Agreement, could be considered and adopted by the Working Parties at a later stage.

⁴ On the basis of EU Directive 2008/57/EC of 17 June 2008 on the interoperability of the rail system within the Community (Recast), Commission Decision of 20 December 2007 contains a technical specification for interoperability (TSI) relating to the infrastructure sub-system of the trans-European high-speed rail system. Parameters added (in addition to AGC) stem from TSI relating to technical compatibility for infrastructure domain only (Commission decision 2008/217/EC).

⁵ Provisions relating to the infrastructure sub-system of conventional rail system are still under development <<http://www.era.europa.eu/Core-Activities/Interoperability/Pages/INT-Recommendations.aspx>>.

⁶ TAR has been developed under the auspices of the United Nations Economic Commission for Asia and the Pacific (ESCAP) and came into force on 11 June 2009. As of 1 May 2010, it has 14 Contracting Parties. Annex II of the TAR contains "Guiding principles relating to technical characteristics of the Trans-Asian Railway Network" which are referred to in the table <<http://www.unescap.org/ttdw/common/TIS/TAR/fact.asp>>.

⁷ <<http://www.unece.org/trans/main/ter/ter.html>>.

⁸ European Rail Infrastructure Managers: European Railway Technical Strategy, Technical Vision to guide the development of TSIs, Version 1.2, September 2008. Values refer to international traffic through to 2035 (excluding light, regional, inter- and sub-urban traffic).

⁹ <http://www.ferrmed.com/eng/>.

¹⁰ TRANS/WP.24/2005/5.

Annex

Technical characteristics of main international railway and combined transport lines

Parameter	AGC Agreement Annex II (ECE/TRANS/63/Rev.1)			AGTC Agreement Annex III (ECE/TRANS/88/Rev.5)		Technical Specification for Interoperability (TSI) European Union					Country proposals (TRANS/WP.24/ 2005/5)	
	Existing lines	New lines		Existing lines (targets)	New combined transport lines	Trans-European High-Speed Rail System (2008/217/EC)	Trans-European Conventional Rail System (draft)	Trans-Asian Railway Network (TAR)	TER Standards	European Infrastructure Managers (EIM)	FERRMED Standards	Relevance (yes/no) (Target values)
		Passenger lines only	Passenger and goods traffic									
1 Number of tracks	-	2	2	-	2	-	-	-	-	-	2	Yes 2
2 Vehicle loading gauge (minimum infrastructure gauge)	UIC B	UIC C1	UIC C1	UIC B	UIC C	Gauge GC (reference kinematic profile) For modification work, GB permitted	Gauge GC, GB or GA depending on TSI categories of line	Unhindered movements of at least ISO 20 ft containers	UIC B	-	UIC C	Yes UIC C
3 (Minimum) distance between track centres	4.0 m	4.2 m	4.2 m	4.0 m	4.2 m	<4.0 m (<230 km/h) 4.0 m (230–≤250 km/h) 4.2 m (250–≤300 km/h) 4.5 m (>300 km/h)	Depending on gauge (to be published in Register of Infrastructure)	-	4.0 m	-	-	Yes 4.2 m
4 Nominal minimum speed	160 km/h	300 km/h	250 km/h	120 km/h	120 km/h	-	Line speed for new and upgraded lines 100–200 km/h depending on TSI categories of line	-	120 km/h	100 km/h (Heavy freight) 120 km/h (Conventional freight) 250 km/h (Logistical freight) 200–250 km/h (Conventional higher)	-	Yes Need better definition. Possibly use: Maximum (design) speed

Parameter	AGC Agreement Annex II (ECE/TRANS/63/Rev.1)			AGTC Agreement Annex III (ECE/TRANS/88/Rev.5)		Technical Specification for Interoperability (TSI) European Union				Country proposals (TRANS/WP.24/ 2005/5)		Relevance (yes/no) (Target values)	
	New lines			Existing lines (targets)	New combined transport lines	Trans-European High-Speed Rail System (2008/217/EC)	Trans-European Conventional Rail System (draft)	Trans-Asian Railway Network (TAR)	TER Standards	European Infrastructure Managers (EIM)	FERRMED Standards		
	Existing lines	Passenger lines only	Passenger and goods traffic										
5	Authorized mass per axle	-	-	-	-	-	20–25 t depending on TSI categories of line (no differentiation by type of rolling stock)	-	-	-	-	-	-
5a	Locomotives (≤200 km/h)	22.5 t	-	22.5 t	-	-	-	-	-	-	-	-	-
5b	Rail cars and rail motor sets (≤300 km/h)	17 t	17 t	17 t	-	-	-	-	-	-	-	-	No 22.5 t
5c	Carriages	16 t	16 t	16 t	-	-	-	-	-	-	-	-	No 22.5 t
5d	Wagons (≤100 km/h)	20 t	-	22.5 t	22.5 t	22.5 t	-	-	-	-	35 t (Heavy freight)	22.5–25 t	No 22.5 t
	(120 km/h)	20 t	-	20 t	20 t	20 t	-	-	-	20 t	25 t (Convention al freight)	-	-
	(140 km/h)	18 t	-	18 t	-	-	-	-	-	18 t	18 t (High-speed freight)	-	-
											18 t (Convention al higher, high speed)	-	-
6	Authorized mass per linear meter j/	8 t	-	8 t	-	-	-	-	-	8 t	-	-	Yes

Parameter	AGC Agreement Annex II (ECE/TRANS/63/Rev.1)			AGTC Agreement Annex III (ECE/TRANS/88/Rev.5)		Technical Specification for Interoperability (TSI) European Union					Country proposals (TRANS/WP.24/2005/5) Relevance (yes/no) (Target values)	
	New lines			Existing lines (targets)	New combined transport lines	Trans-European High-Speed Rail System (2008/217/EC)	Trans-European Conventional Rail System (draft)	Trans-Asian Railway Network (TAR)	TER Standards	European Infrastructure Managers (EIM)		FERRMED Standards
	Existing lines	Passenger lines only	Passenger and goods traffic									
7 Test train (bridge design)	UIC 71	-	UIC 71	-	-	-	-	-	UIC 71	-	-	-
8 Maximum (rising and falling) gradient k/	-	35 mm/m	12.5 mm/m	-	12.5 mm/m	35 mm/m (Line category I) ¹¹ ≤ 35 mm/m (Line categories II and III) ¹²	12.5–35 mm/m (under certain conditions (“envelope”) depending on TSI categories of line)	-	-	-	12 mm/m	No
9 Minimum platform length in principal stations (platforms)	400 m	400 m	400 m	-	-	-	-	-	250 m	-	-	Term is unclear: “Principal station” 300 m–320 m
10 Minimum useful siding length	750 m	-	750 m	750 m	750 m	-	-	-	500 m	-	-	Yes 750 m–1000 m
11 Level crossings	None	None	None	-	-	-	-	-	-	-	-	No
12 Nominal track gauge	-	-	-	-	-	1 435 mm	1 435 mm	1 000 mm 1 067 mm 1 435 mm 1 520 mm 1 676 mm (reference)	-	-	-	-
13 Minimum radius of curvature	-	-	-	-	-	Values refer to cant deficiency	Different values for horizontal	-	-	-	-	-

¹¹ Line of category I: Specially built high-speed lines equipped for speeds generally equal to or greater than 250 km/h.

¹² Line of category II: Specially upgraded high-speed lines equipped for speeds of the order of 200 km/h.

Line of category III: Specially upgraded high-speed lines or lines specially built for high-speed, which have special features as a result of topographical, relief, environmental or town-planning constraints, on which the speed must be adapted to each case.

Parameter	AGC Agreement Annex II (ECE/TRANS/63/Rev.1)			AGTC Agreement Annex III (ECE/TRANS/88/Rev.5)		Technical Specification for Interoperability (TSI) European Union					Country proposals (TRANS/WP.24/ 2005/5) Relevance (yes/no) (Target values)		
	New lines			Existing lines (targets)	New combined transport lines	Trans-European High-Speed Rail System (2008/217/EC)	Trans-European Conventional Rail System (draft)	Trans-Asian Railway Network (TAR)	TER Standards	European Infrastructure Managers (EIM)		FERRMED Standards	
	Existing lines	Passenger lines only	Passenger and goods traffic										
14	Cant	-	-	-	-	-	-	and vertical curves	-	-	-	-	-
14	Rate of change a of cant (function of time)	-	-	-	-	-	-	Various values depending on TSI categories of line	-	-	-	-	-
14	Cant deficiency b	-	-	-	-	-	80–180 mm (depending on line category (I-III) and speed (≤160– >300 km/h)	Various values depending on rolling stock and track	-	-	-	-	-
15	Equivalent conicity	-	-	-	-	-	Wheel-rail interface values for 7 speeds ≤160–>300 km/h	-	-	-	-	-	-
16	Rail inclination	-	-	-	-	-	1/20–1/40 (Plane line) Specific provisions for switches and crossings	1/20–1/40 (Plane line) Specific provisions for switches and crossings	-	-	-	-	-
17	Railhead profile	-	-	-	-	-	Values for plain lines, switches and crossings	-	-	-	-	-	-
18	Switches and crossings	-	-	-	-	-	Various values	Various values	-	-	-	-	-
19	(Global) track stiffness	-	-	-	-	-	Open point (complete)	-	-	-	-	-	-

Parameter	AGC Agreement Annex II (ECE/TRANS/63/Rev.1)			AGTC Agreement Annex III (ECE/TRANS/88/Rev.5)		Technical Specification for Interoperability (TSI) European Union					Country proposals (TRANS/WP.24/ 2005/5) Relevance (yes/no) (Target values)	
	New lines			Existing lines (targets)	New combined transport lines	Trans-European High-Speed Rail System (2008/217/EC)	Trans-European Conventional Rail System (draft)	Trans-Asian Railway Network (TAR)	TER Standards	European Infrastructure Managers (EIM)		FERRMED Standards
	Existing lines	Passenger lines only	Passenger and goods traffic									
20	Track resistance to applied loads	-	-	-	-	-	Various values (rail fastening system)	-	-	-	-	-
21	Structures resistance to traffic loads	-	-	-	-	-	Various values	-	-	-	-	-
22	Track geometrical quality and limits on isolated defects	-	-	-	-	-	Various values	-	-	-	-	-
23	Electrical characteristics	-	-	-	-	-	Various values (protection, insulation)	-	-	-	-	-
24	Platforms	-	-	-	-	-	Various values by line category (access, usable length and width, height, distance from track center, track layout, etc.)	No specific value, but various requirements	-	-	-	-
25	Stabling tracks and other locations with low speed	-	-	-	-	-	Various values (length, gradient, radius of curvature)	Various values	-	-	-	-
6	Fixed installations for servicing trains	-	-	-	-	-	Various values (toilet discharge, external cleaning facilities, water restocking, etc.)	-	-	-	-	-

Parameter	AGC Agreement Annex II (ECE/TRANS/63/Rev.1)			AGTC Agreement Annex III (ECE/TRANS/88/Rev.5)		Technical Specification for Interoperability (TSI) European Union				Country proposals (TRANS/WP.24/ 2005/5)		
	Existing lines	New lines		Existing lines (targets)	New combined transport lines	Trans-European High-Speed Rail System (2008/217/EC)	Trans-European Conventional Rail System (draft)	Trans-Asian Railway Network (TAR)	TER Standards	European Infrastructure Managers (EIM)	FERRMED Standards	Relevance (yes/no) (Target values)
		Passenger lines only	Passenger and goods traffic									
27	Ballast pick-up	-	-	-	-	Open point	-	-	-	-	-	-
28	Power source	-	-	-	-	-	-	-	-	Portable (Heavy freight) Portable (Conventio- nal freight) Electric/ portable (High-speed logistical freight) Electric/ portable (Convention al higher speed) Electric (High speed)	-	Catenary values 45 000/16 2/3 Hz 25 000/50 Hz
29	Train control	-	-	-	-	-	-	-	-	ETCS	ETCS	-
30	Design frequency (trains/hour)	-	-	-	-	-	-	-	-	1-6 (Heavy freight) 4-24 (Multi purpose core network) ¹³ 12 (High speed)	-	-

¹³ A multi-purpose core network consists of routes which are designed for multiple use, so that they are available for all traffic from logistical freight through high speed passenger to local stopping services. Differentiation needs to be made to heavy freight routes available for high axle loads.