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**ANALYSIS OF THE CER PROPOSED REQUIREMENTS TO COVER  
"INTERCHANGEABLE COACHES" - SITUATION AFTER WORKSHOP  
OF 4 NOVEMBER 2015**

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For Information

## Analysis of the CER proposed requirements to cover "interchangeable coaches" - Situation after workshop of 4 November 2015

Additional requirements are allocated to the following categories:

- A: create a new section in the TSI 'additional requirements to facilitate coupling of TSI conform passenger coaches between them and/or with existing RIC coaches together in a train composition';
- B: add the requirement to the general operation (GO) vehicles;
- C: Improve some TSI technical details;
- D: information for the Application Guide or for a Request of standard

Ref	Extract of TSI LOC&PAS 1302/2014 on « general operation provisions»	CER Proposed amendment (04/09/2015 OTIF WG TECH meeting)	Proposed way forward	Suggested requirement
1.	2.2.2 C) Passenger carriages and other related cars	A Coach is a vehicle without traction in a fixed or variable formation capable of carrying passengers (by extension, requirements specified to apply to coaches in this TSI are deemed to apply also to restaurant cars, sleeping cars, couchettes cars, etc.). <b>An "Interchangeable coach" is a coach designed for general operation by complying with a pre-defined set of requirements.</b>	A, no need for a definition	Not applicable
2.	4.2.2.2.3 End coupling  b) Requirements on "Manual" coupling system b-1) Provisions to units (1) - The coupling system shall be designed so that no human presence between the units to be coupled / uncoupled is required whilst either one is moving. <b>— For units designed and assessed to be operated in 'general operation' or in 'predefined formation', and fitted with a</b>	Add after b-1) (1) second dash: "Interchangeable coaches shall be fitted with a manual coupling system, this coupling system shall be of UIC type (as defined in clause 5.3.2)"	A	Coaches shall be fitted with a manual coupling system, this coupling system shall be of UIC type (as defined in clause 4.2.2.2.3 b) and 5.3.2)"

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	<u>manual coupling system, this coupling system shall be of UIC type (as defined in clause 5.3.2).</u>			
3.	5.3.2. Manual end coupling [...]	Please add in this section : <b><u>“For interchangeable coaches the clearance for the draw hook shall be in accordance with EN 16116-2, clause 6.3.2 and prEN16839 figure 7”</u></b>	C	Manual coupling is fully covered as a technical solution in the TSI. When all relevant EN standards will be available, the TSI will be limited to a reference to those EN standards.  Pending the availability of the standard, the following requirement could be added: <i>"The clearance for the draw hook shall be in accordance with EN 16116-2, clause 6.3.2 and prEN16839 figure 7"</i>
4.	5.3.2. Manual end coupling [...]	Please add in this section : <b><u>“For interchangeable coaches there shall be no fixed parts within 40 mm of a vertical plane placed at the end of the fully compressed buffers.”</u></b>	C	See point 3 above. Pending the availability of the standard, the following requirement could be added: <i>"There shall be no fixed parts within 40 mm of a vertical plane placed at the end of the fully compressed buffers."</i>
5.	5.3.2. Manual end coupling [...]	Please add in this section : <b><u>“For interchangeable coaches the characteristics of the buffers and draw gear shall be designed in order to enable the safe transit of curves in the track with a radius of 150 m. Two units with bogies coupled on straight track with touching buffers shall generate compressive forces not higher than 250 kN on a 150 m radius curve. There is no requirement specified for two axle units.”</u></b>	C	See point 3 above. Pending the availability of the standard, the following requirement could be added:  <i>"The characteristics of the buffers and draw gear shall be designed in order to enable the safe transit of curves in the track with a radius of 150 m. Two units with bogies coupled on straight track with touching buffers shall generate compressive forces not higher than 250 kN on a 150 m radius curve. There is no requirement specified for two axle units"</i>

Ref	Extract of TSI LOC&PAS 1302/2014 on « general operation provisions”	CER Proposed amendment (04/09/2015 OTIF WG TECH meeting)	Proposed way forward	Suggested requirement
6.	4.2.4.3. Type of brake system	We propose to add at the end of 4.2.4.3 (1): <b><u>“For interchangeable coaches the specification referenced in Appendix J-1, index NEW (=EN 14198:2016) apply in addition.”</u></b>	C	<i>UIC braking system is already covered in the TSI and is mandatory for (GO) vehicles by reference to the current version of EN 14198. This reference will be updated after review of the revised standard prEN 14198:2016.</i>
7.	<u>4.2.6.1.1</u>	<b><u>Add “interchangeable coaches shall at least meet T1 requirements”</u></b>	<i>A only if this requirement exists in RIC2006: CER to check</i>	<i>If confirmed: Coaches shall be designed for the temperature range T1 (or a wider range)</i>
8.	4.2.6.1.1 Temperature [...] (3) The temperature to consider for design purpose of rolling stock constituents shall take into account their integration in the rolling stock.	Please add bullet point at the end of point 3 “- The following requirement is deemed to comply with the range T1 and T3 indicated in point (1): The grease for the lubrication of roller bearing shall be specified for ambient temperatures down to – 20° C. - Air reservoirs shall be designed for the temperature range of – 40 °C to + 100 °C. - Brake cylinders and brake couplings shall be designed for the temperature range of – 40° C to + 70° C - Hoses for air brakes and air supply shall be specified for the temperatures range – 40 °C to + 70° C	D	<i>Not applicable</i>
9.	4.2.12.2	Please add following requirement after (1) : <b><u>“The applicant shall in particular present in the technical file all information necessary to manage welding maintenance and performance during the life Cycle of the vehicle.</u></b>  <b><u>Application of EN 15085-1-5:2007 is a sufficient mean of conformity to fulfill this requirement.”</u></b>	<i>D: standards giving presumption of conformity should be in Application Guide.</i>	<i>The application guide already lists the EN 15085-1 (see its Annex 1, “strength of vehicle structure”).</i>
10.	4.2.12.2	Please add as point (17) : <b><u>“For interchangeable coaches: Description of all</u></b>	B	<i>See OTIF/ERA proposal dated 04/08/2015. Add in clause 4.2.12.2 of the TSI the following:</i>

Ref	Extract of TSI LOC&PAS 1302/2014 on « general operation provisions»	CER Proposed amendment (04/09/2015 OTIF WG TECH meeting)	Proposed forward way	Suggested requirement
		<u>coupling interfaces including description of functionality, specification of interfaces and data processing and protocols.</u>		“(3 b) For units designed and assessed to be operated in ‘general operation’, description of the electric interfaces between vehicles and of the communication protocols, with the references to the EN standards or other normative documents that have been applied.”
11.	4.2.7.1.3 Tail lights	Please add : (2) For units without driver’s cab assessed for general operation, <b>excluding interchangeable coaches</b> , the lamps may be portable lamps; in that case, the type of portable lamps...  Add: <b>“(2 b) Interchangeable coaches shall be fitted with an attachment device supporting and allowing the correct position of the portable front or rear end signal”</b>	A	Coaches shall be fitted with fixed red tail lamps.
12.	4.2.2.3	Please add in clause of the TSI the following: <b>“For interchangeable coaches fitted with a gangway, this gangway shall comply with the annexes A or B of EN 16286-1:2013”</b>	A	Coaches fitted with a gangway: this gangway shall comply with the annexes A or B of EN 16286-1:2013”
13.	4.2.8.2. Power supply	Please add in section 1 (general) :  “For interchangeable coaches the power supply shall fulfill CLC TS <b>50534 Annex A</b> ”	A	The power supply shall fulfill CLC TS 50534 Annex A” UNIFE to confirm technical relevance.

Ref	Extract of TSI LOC&PAS 1302/2014 on « general operation provisions »	CER Proposed amendment (04/09/2015 OTIF WG TECH meeting)	Proposed way forward	Suggested requirement
14.	4.2.5.3.7 Applicability to units intended for general operation (1) Only functionalities that are relevant to the design characteristics of the unit (e.g. presence of a cab, of a crew interface system,...) shall be considered. (2) The signals transmission required between the unit and the other coupled unit(s) in a train for the passenger alarm system to be available at train level shall be implemented and documented, taking into account functional aspects described above in this clause. <b>(3) This TSI does not impose any technical solution regarding physical interfaces between units.</b>	Please replace point (3) by “(3) <b>Except for interchangeable coaches</b> this TSI does not impose any technical solution regarding physical interfaces between units. <b>Interchangeable coaches shall be equipped with a train wide information and control lines. The cable and plug of at least one line shall comply with UIC558.</b> ”	A	<i>The cable and plug of at least one line shall comply with the 18- conductor cable defined in UIC558 (plate 2). The objective is to ensure the continuity of the 18 train lines in case of coupling with existing RIC coaches; the functional compatibility is not required. (CER to check if this is OK for compatibility with existing RIC coaches)</i>
15.	4.2.5.4. (6) Applicability to units intended for general operation: Only functionalities that are relevant to the design characteristics of the unit (e.g. presence of a cab, of a crew interface system, etc.) shall be considered. The signals transmission required between the unit and the other coupled unit(s) in a train for the communication system to be available at train level shall be implemented and documented, taking into account functional aspects. <b>This TSI does not impose any technical solution regarding physical interfaces between units.</b>	Please replace point (6) by : (6) Applicability to <b>interchangeable coaches</b> : Only functionalities that are relevant to the design characteristics of the unit (e.g. presence of a cab, of a crew interface system, etc.) shall be considered. The signals transmission required between the unit and the other coupled unit(s) in a train for the communication system to be available at train level shall be implemented and documented, taking into account functional aspects. <b>If data communication protocol are used, they shall comply with IEC 61375.</b>	B  A or B	See point 10 above.  UNIFE to confirm technical relevance.
16.	4.2.13 Markings	Add a new clause: 4.2.13 Markings For <b>interchangeable coaches</b> markings of the specification referenced in Appendix J-1, index 106 are required where applicable.  New Appendix J-1, index 106: EN 15877-1:2013	A	<i>Application of EN 15877-2:2013. CER to confirm the list of relevant markings.</i>

17.	<p>6.2.7. Assessment of units intended to be used in general operation</p> <p>(1) Where a new, upgraded or renewed unit to be used in general operation is subject to assessment against this TSI (in accordance with clause 4.1.2), some of the TSI requirements require a reference train for their assessment. This is mentioned in the relevant provisions of Section 4.2. Similarly, some of the TSI requirements at train level cannot be assessed at unit level; such cases are described for the relevant requirements in Section 4.2 of this TSI.</p> <p>(2) The area of use in terms of type of RST which, coupled with the unit to be assessed, ensures that the train is compliant with the TSI is not verified by the Notified Body.</p> <p>(3) After such a unit has received the authorisation to be placed in service, its use in a train formation (whether TSI compliant or not) shall be dealt with under the responsibility of the Railway Undertaking, according to the rules defined in clause 4.2.2.5 of the OPE TSI (train composition).</p>	None	B	<p>See OTIF/ERA proposal dated 04/08/2015: Add in clause 6.2.7 of the TSI the following: “(2 b) In the case where technical markings are affixed to the unit, the Notified Body shall verify that these markings are compliant to EN 15877-2:2013 and are consistent with the technical characteristics of the unit as documented in the technical documentation described in clause 4.2.12 of this TSI”. ERA proposal do not include the obligation to mark the interchangeable coaches</p>
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