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Co-financed by the Connecting Europe Facility of the European Union

Project for the implementation of the CEF PSA UBS

December 2022 | DB Cargo AG | L.CBS 6 Working Procedures Ground Staff

The initiation of the actions



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N° OF ISSUE	NAME OF THE ISSUE	DESCRIPTION
1. BRAKING (Priority 1)		
1	Braking sheets	Every country and nearly every RU uses a different Braking Sheet with different layout and content. The UIC Leaflet 472 gives a frame with mandatory and optional Data and an example for the layout.
2	Braking performance	Requirements for braking performance (in particular the braking percentages) as well as the braking calculations are different in the Member States.

- In 2017, the EU initiated a “Issue Logbook of technical problems in railway operations” with the aim of identifying interoperability barriers hampering international rail freight traffic. One of the most important priorities that has been identified and that is encountered by the railway sector is the technical operational issue of different national braking sheets and braking performance requirements (Priority 1).



Contributing to the removal of obsolete national rules or company rules



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- In the end of 2018, the DB Cargo AG launched efforts with its national entities to solve the issues.
- A first study concerning „Braking“ on the Rail Freight Corridor 1 has carried out 2019. Requirements for the change of brake rules along the corridor RFC 1 have been defined by DBC NL/DE/CH/IT.
- Based on these findings, a working group of brake experts from various European RUs, led by Xrail and the UIC, has developed a proposal for common rules for the brake position and the content of an European braking sheet and wagon list. This is called Unified Braking Scheme (UBS).

DB Cargo as trendsetter to Unified Braking Scheme (UBS) in Europe.

- The goal was to roll out the UBS solution on the Rhine-Alpine Corridor
- For this purpose, the CEF PSA UBS project was launched in 2020.

The project members

- DB Cargo AG (Germany, Netherlands, Italy)
- UIC
- EEIG Corridor Rhine - Alpine EWIV
- Eisenbahnbundesamt (EBA)
- DB Netz AG

Funded by European Commission



Pilot UBS implementation along the Rhine-Alpine Corridor

Activity 1

The main objective of the first activity of the Action was to develop pilot projects along the Rhine-Alpine Corridor. These pilots will, in practice, overcome the issue of the different existing national braking sheets and brake position rules, which today hinder interoperable and seamless freight train operations across Europe.

Pilot Activity 1 defines the main tasks in the implementation of the Unified Braking Scheme (UBS) on rail freight sections along the Rhine-Alpine Corridor.



Main tasks of Activity 1

Activity 1



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- Task 1.1 Pilot operations, “on-site test” of the UBS solution along the Rhine-Alpine Corridor
 - First pilot operation, with focus on the Germany/Netherlands rail freight section
 - Second pilot operation, with focus on the German/Netherlands/Switzerland/Italy
- Task 1.2 Training sessions for operational staff to adopt the UBS solution along the Rhine-Alpine Corridor
- Task 1.3 “Best practices” workshop to share pilot project activities and results, including the publication of the UBS results
 - “Pilot development” workshop
 - “Implementation” workshop



Adjustment of the targets

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1. BRAKING (Priority 1)		
1	Braking sheets	Every country and nearly every RU uses a different Braking Sheet with different layout and content. The UIC Leaflet 472 gives a frame with mandatory and optional Data and an example for the layout.
2	Braking performance	Requirements for braking performance divided in 2.1 and 2.2
2.1	Brake calculation	Calculation of the available and the required brake percentage
2.2	Brake position	Adjustment of the brake position depending on total train weight

- In cooperation with the UBS project of XRail and UIC, barriers to fully harmonize the calculation of required and existing brake percentage have been identified.

First pilot operation

Activity 1 (Netherlands/Germany)

No.	Points of interest	Deliverables
1	RU implementation of brake position rules	DBC Netherland adopts the brake position regulations in the rules of the RU.
2	UBS training sessions	The changed regulations were trained to the operational staff and have been applied since then.
3	First test trains	The first test train runs were successfully carried out in August 2020.
4	Regular operation	Trains from NL to DE still run according to the brake position rules of the CEF PSA UBS project.



Second pilot operation

Activity 1 (Netherlands/Germany/Switzerland/Italy)

No.	Points of interest	Deliverables
1	UBS training sessions	The changed regulations were trained to the operational staff.
2	Second test trains	The second test train runs were successfully carried out in December 2021.
4	RU implementation of brake position rules	The RUs are in the process of permanently implementing the changes in their rules.
5	RU implementation of brake sheet and wagon list	The RUs are in the process of implementing the documents into their IT systems.



Findings of Activity 1

First and second Pilot operation

Adaption of the brake position rules

Cooperation with infrastructure managers or authorities could be necessary.

Check processes and procedures within the railway undertaking in parallel from the beginning.

Influence of the 2nd and 3rd TrainDY study.

The braking position rules are understandable and easily adaptable to operational procedures.

Three-part training, theory, practice, web-based is the best way.

Adaption of the braking sheet and wagon list

Layout of the braking sheet and wagon list is intuitive.

The structure of the document is simple and very clear.

Braking sheet and wagon list in one document.

Extended range of application.

Electronically created documents.

Effective training in handling.

Common brake sheet/wagon list

- The new international brake sheet (V1.1) covers all requirements. The information in the boxes are clear for the driver anyway which language he speaks.

International brake sheet and wagon list				5. Country code			
1. Issuing RU	2. Train number	3. Departure date	6. Train profile:				
4a. Valid from station		4b. Valid to station		7. V_{max} , km/h:			
8. Remarks during the journey				9. Special features of the train			
<input type="checkbox"/> 10. Dangerous goods in train <input type="checkbox"/> 13. Waste shipments in train <input type="checkbox"/> 14. Cast iron brake blocks used for >50% of braked weight		<input type="checkbox"/> 11. Exceptional consignment in train		<input type="checkbox"/> 12. Additional documents about restrictions added			
		17a. Valid from station	17b. Valid to station	17a. Valid from station	17b. Valid to station		
		18a. # of first wagon	18b. # of last wagon	18a. # of first wagon	18b. # of last wagon		
15. Required line	16. Brake setting	a	b	a+b	a	b	a+b



New common brake sheet/wagon list

- The new international brake sheet (V1.2) covers all requirements. The information in the boxes are clear for the driver anyway which language he speaks.

Train number: _____ Train date: _____

International brake sheet and wagon list

1. Issuing RU			2. Train number		3. Departure date		5. Country code							
4a. Valid from station			4b. Valid to station			6. Train profile:								
7. v _{max} , km/h:														
Train parameters														
8. Remarks during the journey						9. Special features of the train								
10. Dangerous goods in train			16a. Valid from station		16b. Valid to station		16c. Valid from station		16d. Valid to station					
11. Exceptional consignment in train			17a. # of first wagon		18a. # of last wagon		17c. # of first wagon		18c. # of last wagon					
12. Additional documents about restrictions added			a		b		a+b		c		d		c+d	
13. Waste shipments in train			Active locomotives		Wagons and inactive locomotives		Total		Active locomotives		Wagons and inactive locomotives		Total	
19. Count nos														



Common rules for brake position

Train weight without locomotive	Timetabled train type: P				
	Brake position of leading working locomotives	Brake position of the first 5 vehicles thereafter	Brake position of all following vehicles	What if required brake position is not possible?	Maximum allowance of non-braking vehicles
0...800 t	P	P	P	Turn brakes off	3 consecutive wagons; but first and last vehicle of the wagon rake (excl. leading working locomotives) must be able to brake / <i>Teilbremsverhältnis</i> to be checked for trains towards / through Switzerland**
801...1200 t	G	P	P		
1201...1600 t	G	G	P		
1601...2500 t	G	G (only wagons ≥32 t*)	P (only wagons ≥32 t*)		
2501... 4000 t	G	G (only wagons ≥40 t*)	P (only wagons ≥40 t*)		

* Permanently coupled and articulated wagons forbidden – rule currently in review within 2nd TrainDY study

** It is in the responsibility of every RU to ensure compliance with TSI-OPE in every train. This means, that in case of doubt RUs are responsible to install procedures that ensure that they also fulfill TSI-OPE 4.2.2.6.1 (i.e. when preparing a train that is known to run via a stretch with a high gradient, the generally allowed number of consecutive non-braking wagons may not be used to full extent / *Teilbremsverhältnis* should be checked)

Train weight without locomotive	Timetabled train type: G		
	Brake position of all vehicles (incl. locomotive)	Maximum allowance of brake position P	Maximum allowance of non-braking vehicles
0...800 t	G	12 axles, for the rest turn brakes off	3 consecutive wagons; but first and last vehicle of the wagon rake (excl. leading working locomotives) must be able to brake / <i>Teilbremsverhältnis</i> to be checked for trains towards / through Switzerland*
801...1200 t	G		
1201...1600 t	G		
1601...2500 t	G		
2501... 4000 t	G		

* It is in the responsibility of every RU to ensure compliance with TSI-OPE in every train. This means, that in case of doubt RUs are responsible to install procedures that ensure that they also fulfill TSI-OPE 4.2.2.6.1 (i.e. when preparing a train that is known to run via a stretch with a high gradient, the generally allowed number of consecutive non-braking wagons may not be used to full extent / *Teilbremsverhältnis* should be checked)

REMARKS

- In case of articulated or permanently coupled wagons each sub-unit counts as a separate wagon. In "long locomotive" it is allowed to have >5 such sub-units (e.g. 3 articulated wagons) in brake position G if the sub-units exceeding the norm belong to the same articulated or permanently coupled wagon, which also has sub-units within the first 5 vehicles (see UIC 421 Appendix A)
- Even if one of the first five vehicles in train does not have a functioning braking system it shall nevertheless be considered as part of "long locomotive"
- Trains to Austria may also run in position P even if the path used was foreseen for a G-train (to avoid change of brake position on the border)



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New common rules for brake position

- In cooperation with the UBS project of XRail and UIC, the report of the 2nd TrainDY study for wagons weight limits and articulated wagons was analysed.

Wagon rake weight (excl. active locos)	P-braked trains				G-braked trains		
	Brake position of leading active locomotives	Brake position of the first vehicles thereafter and their count	Brake position of all following vehicles	What if required brake position not possible?	Brake position of all vehicles	Maximum allowance of brake position P	Allowance of unbraked vehicles
0...800 t	P	P	P	Turn brakes off	G	12 axles, for the rest brakes are to be turned off if brake position G is not possible	Any train may have up to 3 consecutive unbraked wagons, but the first and last wagon of the wagon rake must have active brakes
801...1200 t	G	P	P				
1201...1600 t	G	5 x G	P				
1601...2300 t	G	7 x G*	P*				
2301...4000 t	No harmonization						

* Articulated wagons forbidden. However, permanently coupled (in German "Kurzgekuppelte") wagons allowed.



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