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Federal Department of the Environment
Transport, Energy and Communications DETEC

Federal Office of Transport FOT
Infrastructure Division

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-001**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	June 2015
Title:	Pantograph head width						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern SWITZERLAND	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						
Referenced TSI article:	LOC & PAS TSI (1302/2014/EU) Sections 4.2.8.2.9.2/7.3.2.16						
Reference in Swiss regulation:	RailO Art. 18 and IP 18 Sheet 16 N						
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI						
Full description:	The pantograph head width on most lines in Switzerland is restricted to 1450 mm. On some lines, in particular border traffic lines, wider heads up to 1950 mm are possible. Details can be found in the line database or in the infrastructure manager's network statement.						
Current applicable norms in Switzerland:	See national reference/RailO Art. 18 and IP 18 Sheet 16 N.						
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulations referenced above (esp. SBB R I 50127).						

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-002**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	Narrow switches/Test of passage through switches						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern SWITZERLAND	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						
Referenced TSI article:	LOC & PAS TSI (1302/2014/EU) Section 4.2.3.4.1 Safety against derailment running on twisted track						
Reference in Swiss regulation:	RailO Art. 47 para. 1 RailO Art. 48 paras. 1 and 2 IP-RailO on Art. 31, para. 2.1 SBB R I 50007						
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI						
Full description:	In comparison with other European countries, the line layout in some station areas in Switzerland is technically difficult to exploit due to the presence of tight deflection curves and short intermediate sections of track with correspondingly small distance between track centres. This places specific requirements on the homologation of new rolling stock that must be taken account of with special testing.						
Current applicable norms in Switzerland:	The norms set out in the implementing provisions of the Railway Ordinance (version 01.07.2014) apply. Please also refer to regulation SBB R I 50007 and UIC leaflets 505 and 506.						
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulations referenced above (esp. SBB R I 50007).						

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-003**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016

Title:	Tight curves r < 250 m		
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section	**Address:**	3003 Bern SWITZERLAND
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch		

Referenced TSI article:	LOC & PAS TSI (1302/2014/EU) Section 4.2.3.4.2 Running dynamic behaviour
Reference in Swiss regulation:	RailO Art. 47 para. 1 SBB R I 50127
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	The Swiss rail network has a relatively large number of lines with curves (R < 250 m) that do not covered by the prescribed technical assessment. Regulations for assessment area 5 (R < 250 m) referring to EN 14363 in progress (FOT, SBB I, BLS I, SOB I working group). The current status can be found in the interim guideline (SBB R I 50127).
Current applicable norms in Switzerland:	The norms set out in the implementing provisions of the Railway Ordinance (version 01.07.2016) apply. Please also refer to regulation SBB R I 50127.
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulations referenced above (esp. SBB R I 50127).

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-004**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016

Title:	Track displacement force		
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section	**Address:**	3003 Bern SWITZERLAND
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch		

Referenced TSI article:	LOC & PAS TSI (1302/2014/EU) Section 6.2.3.4 and Appendix J, in which references to EN14363:2005, in which Section 5.3.2.2 para. a) Driving safety limit values
Reference in Swiss regulation:	RailO Art. 47 para. 1 IP-RailO IP 31 para. 2.1 SBB R I 50127
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	The maximum permitted sum of guiding forces of rolling stock per wheelset is limited by the permitted track displacement resistance of the infrastructure. Due to the design of the superstructure, in Switzerland a coefficient of α = k1 = 0.85 should be generally used as the control value when calculating the maximum sum of guiding forces. A coefficient of α = k1 = 1.0 can only be applied in exceptional cases and requires special verification. On track tests should be carried out on the basis α = k1 = 0.85.
Current applicable norms in Switzerland:	The norms set out in the implementing provisions of the Railway Ordinance (version 01.07.2016) apply. Please also refer to EN 14363:2005 and UIC leaflet 518.
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulations referenced above (esp. EN 14363:2005 and UIC leaflet 518).

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-005**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	Cant deficiency						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern SWITZERLAND	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) corresponding document ERA/TD/2012-17/INT, Version 3.0 Application rules EN14363, Section 4.1
Reference in Swiss regulation:	IP-RailO on Art. 17, IP 17, para. 3.6.2 RailO Art. 47 para 1
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	When speed limits are defined on the Swiss railway network, cant deficiency in the track of 130 mm (freight trains) and 150 mm (passenger trains) is applied without further operating tests. It is therefore essential for rolling stock to be tested for these levels of cant deficiency. Rolling stock not tested for these can't deficiency levels may not be used on the Swiss railway network.
Current applicable norms in Switzerland:	The norms set out in the implementing provisions of the Railway Ordinance (version 01.07.2016) apply. Please also refer to EN 14363:2005.
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulations referenced above.

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-006**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016

Title:	Authorisation of rolling stock with Series N tilting system		
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section	**Address:**	3003 Bern SWITZERLAND
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch		

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) Section 4.2.3.4.2
Reference in Swiss regulation:	RailO Art.17 IP-RailO IP 17 8
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	In Switzerland tilting trains run on tracks designed for the R-series. For rolling stock homologation on specific lines it must be shown that tipping trains can be driven at the envisaged speed. Currently, in Switzerland only trains constructed with an active tilting system to achieve high cant deficiency are regulated by law and permitted under the term 'tilting trains'. Where necessary, other systems can be similarly defined according to the tilting train specifications.
Current applicable norms in Switzerland:	The norms set out in the implementing provisions of the Railway Ordinance (version 01.07.2016) apply. Please also refer to regulation SBB R I 20019.
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulations referenced above (esp. SBB R I 20019).

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-007**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	June 2015
Title:	Flange lubrication						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern SWITZERLAND	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) Section 3.3.1 Essential Requirements not covered by TSI
Reference in Swiss regulation:	RailO Art. 47 para. 1
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	Flange lubrication, requirements for construction of locomotives with flange lubrication system to protect track in tight bends.
Current applicable norms in Switzerland:	RailO Art. 47 para. 1 is applicable, i.e. rolling stock must be adjusted to the superstructure. RTE 49410 defines the specific construction requirements for locomotives with flange lubrication.
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation RTE 49410 referenced above.

Notified national technical rules (NNTR)

ID	CH-TSI LOC&PAS-009	State:	Switzerland	Status	Applicable	from:	June 2015
Title:	Exhaust emissions from thermal vehicles						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section			**Address:**		3003 Bern SWITZERLAND	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) Section 4.2.8.3
Reference in Swiss regulation:	RailO Art. 4/IP-RailO IP 4 6 Limiting exhaust emission Based on Air Pollution Control Ordinance
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	In Switzerland the requirements for the use of diesel engines (compression-ignition) are stricter than those applicable to locomotives with diesel engines in Europe. These are based on the Air Pollution Control Ordinance and thus on FOEN specifications.
Current applicable norms in Switzerland:	IP-RailO IP 4 6 FOT Reference to FOEN filter list for compression-ignition engines.
Test specification for certificate of conformity:	Manufacturer's proof of conformity that the engines meet the current applicable FOEN specifications.

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-010**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	June 2015

Title:	Optical warning signal at front of train: 3 x red		
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section	**Address:**	3003 Bern SWITZERLAND
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch		

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) Section 4.2.7.1.2
Reference in Swiss regulation:	Swiss Rail Service Regulations (RSR)
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	Vehicles must be able to display 3 x red at the front of the train in order to warn the oncoming train of danger. Requirement goes beyond TSI requirements.
Current applicable norms in Switzerland:	RSR R 300.2 para. 8.1.2
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation referenced above.

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-011**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	Traction limitation						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**		3003 Bern SWITZERLAND
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) Sections 4.2.8.2.3 / 4.2.8.2.4 / 4.2.8.2.7/ 6.2.2.2.13 / 6.2.2.2.14 EN 50388
Reference in Swiss regulation:	RailO Art. 44a Point 3.2
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	1.) Frequency-dependent traction limitation 2.) Voltage-dependent traction limitation
Current applicable norms in Switzerland:	SBB R I – 50068/50069
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation referenced above (esp. SBB R I – 50068/50069).

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-012**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016

Title:	Admittance		
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section	**Address:**	3003 Bern SWITZERLAND
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch		

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) Sections 4.2.8.2.3 / 4.2.8.2.4 / 4.2.8.2.7/ 6.2.2.2.13 / 6.2.2.2.14 EN 50388
Reference in Swiss regulation:	RailO Art. 47 para. 1, IP-RailO AB 47.1 Point 4 RailO Art. 83g para. 2
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	In order to reliably prevent the grid converter of converter-driven vehicles (including corresponding grid converter control system) from inducing grid resonance and so causing instability in the railway power supply grid, the frequency response of the input admittance must be passive above a cut-off frequency.
Current applicable norms in Switzerland:	SBB R I – 20005
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation referenced above (esp. SBB R I – 20005).

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-013**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016

Title:	Pantograph/Contact line interaction		
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section	**Address:**	3003 Bern SWITZERLAND
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch		

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) ENE TSI Sections 4.215/4.2.16 EN 50367, EN 50119
Reference in Swiss regulation:	RailO Art. 44 c, IP-RailO DE 44.c para.3.1
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	Proof that maximum permissible contact pressure is respected and therefore also the maximum permissible contact line uplift under defined operating conditions in single and multiple traction.
Current applicable norms in Switzerland:	SBB R-I-50088 EN 50367 Appendix B Tables B1 and B3 column CH
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation referenced above (esp. SBB R-I-50088 and EN 50367 Appendix B Tables B1 and B3 column CH).

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-014**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	Compatibility with track-free announcing devices						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section			**Address:**		3003 Bern SWITZERLAND	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) Section 4.2.3.3.1.3
Reference in Swiss regulation:	RailO Art. 47 para. 1, IP-RailO AB 47.1 Point 3.1
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	Track current interrupted by railway vehicles which lie in the operating frequency range of track circuits.
Current applicable norms in Switzerland:	The norms set out in the implementing provisions of the Railway Ordinance (version 01.07.2016) apply. EN 50238-1; CLCMS 50238-2/50238-3; SBB R I-50097 and R I-50098
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation referenced above.

Notified national technical rules (NNTR)

ID	CH-TSI LOC&PAS-017	State:	Switzerland	Status	Applicable	from:	July 2016
Title:	Infrastructure gauge: general						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section			**Address:**		3003 Bern SWITZERLAND	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) 4.2.9.3.1, 6.2.2.2.2 EN 15273-2
Reference in Swiss regulation:	RailO Art.18/47 IP 18/47 1N – 11N
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	Justification according to EN 15273 A-derogation (see page 2).
Current applicable norms in Switzerland:	The norms set out in the implementing provisions of the Railway Ordinance (version 01.07.2016) apply. Please also refer to EN 15273:2013 (esp. Swiss A-derogation) and UIC leaflets 505 and 506.
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation referenced above and the infrastructure manager's specifications.

See next on page 15

Country-specific derogation (A-derogation) in EN 15273

a) In Switzerland structure gauges and their scope of application are set out in the implementing provisions to the Railways Ordinance (IP-RailO, SR 742.141.11/ https://www.admin.ch/ch/d/sr/c742_141_11.html)
   - For reference kinematic profiles in Article 18.2/47.1
   - For infrastructure gauging in Article 18
   - For track gauging in Article 47

In accordance with these provisions, the reference kinematic profiles and the corresponding calculation rules for all types of gauge (e.g. RailO O1, RailO O2, RailO O4) correspond to EN 15273-1:2013. Appendix C, C.1.1 (especially formulae C.1, C.2 and C.3), for all height values *h.*
In Switzerland it is not permitted to apply calculation rules for kinematic gauges for upper levels (h > 3.250 m), in accordance with EN 15273-1:2013, Appendix C, C.1.12.2 and C.2.3 (especially formulae C.9, C.10 and C.11). The compatibility of the RailO gauges with international gauges in EN 15273-1:2013 is therefore as follows:

- Gauge G1:
  Unrestricted serviceability

- Gauge GA:
  Restricted serviceability within RailO O1 gauge. The formula to be applied to calculate the kinematic track gauge (upper levels) is the same as that of G1, for all height values *h*. The application for heights *h* above 3.250 m, as set out in EN 15273-2 Appendix B, B.3.3.1, B.3.4.1, B.3.5.1 and B.3.6.1, is not permitted in Switzerland. The transport of standard loads for gauge GA is permitted within RailO O1 gauge, in accordance with UIC leaflet 506, Appendix B, Section B.1.1.

- Gauge GB:
  Restricted serviceability within RailO O2 gauge. The formula to be applied to calculate the kinematic track gauge (upper levels) is the same as that of G1, for all height values *h*. The application for heights *h* above 3.250 m, as set out in EN 15273-2 Appendix B, B.3.3.1, B.3.4.1, B.3.5.1 and B.3.6.1, is not permitted in Switzerland. The transport of standard loads for gauge GB is permitted within RailO O2 gauge, in accordance with UIC leaflet 506, Appendix B, Section B.1.1.

- Gauge GC:
  Unrestricted serviceability within RailO O4 gauge.

The infrastructure gauge (upper levels) for all types of gauge (e.g. RailO O1, RailO O2, RailO O4) is calculated in accordance with EN 15273-1:2013, Appendix C, C.2.1, Table C1 (or Appendix C, C.2.3, Table C4) subject to the reference kinematic profiles and the associated calculation rules. The application of the formulae under EN 15273-3:2013 Appendix C, Tables C.2 and C.3 (for heights *h* above 3.250 m) is not permitted in Switzerland.

Justification:

In order to ensure interoperability with regards to the different gauges, the requirements set out in the implementing provisions to the Railways Ordinance (SR 742.141.11/ https://www.admin.ch/ch/d/sr/c742_141_11.html) must also be met in Switzerland.

Switzerland has never accepted the exceptions for height values *h* above 3.250 m (especially for gauges GA and GB) in accordance with UIC leaflet 506, now described in EN 15273-1, EN 15273-2 and EN 15273-3.

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-018**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	Tight track curves						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section			**Address:**		3003 Bern SWITZERLAND	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) 4.2.6.3; CR INF TSI (2011/275/EU)
Reference in Swiss regulation:	RailO Art. 17 and 31 SBB I R 50007
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	*The following minimum track requirements must be met for the free use of train lines in the SBB infrastructure network:* □ *Minimum radius for railcars (and trainsets): Rmin = 125 m* □ *Minimum radius for main-line locomotives: Rmin = 100 m* □ *Minimum radius for passenger carriages: Rmin = 80 m*
Current applicable norms in Switzerland:	The implementing provisions of the Railway Ordinance (version 01.07.2016) apply. Please also refer to SBB regulation R I 50007.
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation referenced above (esp. SBB R I 50007).

Notified National Technical Rules (NNTRs)

ID	**CH-TSI LOC&PAS-019**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	**Prevention of Non Leading mode on the leading vehicle**						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern Switzerland	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	There are no corresponding interface provisions in TSI LOC&PAS (1302/2014/EU) Section 4.3.4 (Interface with the Control, command and signalling subsystem). TSI CCS, SUBSET-034, Section 2.2.3.3.1 also contains a non-application-specific requirement.					
Reference in Swiss regulation:	IP-RailO 38.3, Section 1.1 IP-RailO 47.1, Section 3.2					
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI					
Full description:	**Title:**	Prevention of Non Leading mode on the leading vehicle				
	Type of Requirement	Safety	Reliability/availability	Health	Environment	Technical compatibility
		X	-	-	-	-
	Scope of application	All vehicles equipped with ETCS in Switzerland.				
	Requirement	The vehicle shall send the 'Non-leading permitted' input value to the ETCS on-board unit via the train interface (TI). The TI shall only send 'Non-leading permitted' when the main reservoir is disconnected from the main brake pipe. 'Non-leading permitted' shall not depend on the position of the direction selector.				
	Reasons/explanation	The Non Leading mode is only permitted when the main reservoir is disconnected from the main brake pipe. This prevents that the main brake pipe is refilled. Drivers in Switzerland are not permitted to take the direction selector out of the neutral position before the train departs. Requirement relates to CH-TSI CCS-006.				
	Applies to	2.2.2 +	2.3.0d	3.4.0	3.6.0	
		X	X	X	X	
	Regulation classification	Group C				
	Validity period	unlimited				
Current applicable norms in Switzerland:						
Test specification for certificate of conformity:						

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ID	**CH-TSI LOC&PAS-020**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	**'Sleeping' input value in case of multiple-unit control**						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern Switzerland	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	Currently no corresponding requirements in TSI LOC&PAS.					
Reference in Swiss regulation:	IP-RailO 38.3, Section 1.1 IP-RailO 47.1, Section 3.2					
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI					
Full description:	**Title:**	'Sleeping' input value in case of multiple-unit control				
	Type of Requirement	Safety	Reliability/availability	Health	Environment	Technical compatibility
		X	X	-	-	X
	Scope of application	All vehicles equipped with ETCS in Switzerland.				
	Requirement	A vehicle controlled as a multiple unit (additional locomotive) or as a wagon with driving cab shall send the 'Sleeping requested' input value to the ETCS on-board unit via train interface (TI).				
	Reasons/explanation	An ETCS on-board unit in Sleeping mode processes trackside information. If this vehicle becomes the leading vehicle, it then has the information necessary for the start of mission (e.g. National Values, RBC number, ETCS level, etc.).				
	Applies to	2.2.2 +	2.3.0d	3.4.0	3.6.0	
		X	X	X	X	
	Regulation classification	Group C				
	Validity period	unlimited				
Current applicable norms in Switzerland:						
Test specification for certificate of conformity:						

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ID	**CH-TSI LOC&PAS-021**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	**One-time train running number entry for ETCS and GSM-R cab radio**						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern Switzerland	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	Currently no corresponding requirements in TSI LOC&PAS. (1302/2014/EU).					
Reference in Swiss regulation:	IP-RailO 38.3, Section 1.1 IP-RailO 47.1, Section 3.2					
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI					
Full description:	**Title:**	One-time train running number entry for ETCS and GSM-R cab radio				
	Type of Requirement	Safety	Reliability/availability	Health	Environment	Technical compatibility
		X	X	-	-	-
	Scope of application	All vehicles equipped with ETCS in Switzerland.				
	Requirement	It shall be technically ensured that both the ETCS on-board unit and the GSM-R cab radio use the same train running number. ETCS on-board unit (OBU) and GSM-R cab radio shall have the necessary interface and functional features.				
	Reasons/explanation	The train running number must only be entered once and must be available to the ETCS on-board unit (OBU) and the GSM-R cab radio (GSM-R voice).The train driver can be reached by train radio using the train running number (functional addressing). In particular in long tunnels it must be ensured that the driver can be reached immediately (e.g. due to an incident); this can be done if the same train running number is used. Requirement relates to CH-TSI CCS-032.				
	Applies to	2.2.2 +	2.3.0d	3.4.0	3.6.0	
		X	X	X	X	
	Regulation classification	Group C				
	Validity period	unlimited				
Current applicable norms in Switzerland:						
Test specification for certificate of conformity:						

Notified National Technical Rules (NNTRs)

ID	**CH-TSI LOC&PAS-022**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	**Resetting the emergency brake**						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern Switzerland	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	Currently no corresponding requirements in TSI LOC&PAS.
Reference in Swiss regulation:	IP-RailO 38.3, Section 1.1 IP-RailO 47.1, Section 3.2 AB-EBV 50.2, Sections 2.2.3.3 and 2.2.3.4
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI

Full description:

Title:	Resetting the emergency brake					
Type of Requirement	Safety	Reliability/availability	Health	Environment	Technical compatibility	
	X	X	-	-	-	
Scope of application	All vehicles equipped with ETCS in Switzerland.					
Requirement	It shall only be possible to reset an emergency brake applied by the ETCS on-board unit in standstill. It shall only be possible to reset the emergency brake by a non-standard multiple manipulation.					
Reasons/explanation	In Switzerland, the emergency brake is only applied in safety relevant events. The vehicle must therefore reach standstill as quickly as possible. It must be a conscious action for the driver to reset the brake when the train is at standstill.					
Applies to	2.2.2 +	2.3.0d	3.4.0	3.6.0		
	X	X	X	X		
Regulation classification	Group C					
Validity period	unlimited					

Current applicable norms in Switzerland:	
Test specification for certificate of conformity:	

Notified National Technical Rules (NNTRs)

ID	**CH-TSI LOC&PAS-024**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016

Title:	**Provision of two GSM-R data channels**				
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section			**Address:**	3003 Bern Switzerland
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch				
Referenced TSI article:	Currently no corresponding requirements in TSI LOC&PAS.				
Reference in Swiss regulation:	IP-RailO 38.3, Section 1.1 IP-RailO 47.1, Section 3.2				
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI				

Full description:

Title:	Provision of two GSM-R data channels				
Type of Requirement	Safety	Reliability/availability	Health	Environment	Technical compatibility
	-	X	-	-	-
Scope of application	All vehicles equipped with ETCS in Switzerland.				
Requirement	A vehicle shall make two GSM-R data channels available to the ETCS on-board unit.				
Reasons/explanation	For capacity reasons, an ETCS on-board unit needs to be able to establish a data connection with both RBCs during an RBC handover. Requirement relates to CH-TSI CCS-015.				
Applies to	2.2.2 +	2.3.0d	3.4.0	3.6.0	
	X	X	X	X	
Regulation classification	Group C				
Validity period	unlimited				

Current applicable norms in Switzerland:	
Test specification for certificate of conformity:	

Notified National Technical Rules (NNTRs)

ID	**CH-TSI LOC&PAS-025**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016

Title:	**Inhibited operability to isolate the ETCS on-board unit**					
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern Switzerland
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch					
Referenced TSI article:	Currently no corresponding requirements in TSI LOC&PAS.					
Reference in Swiss regulation:	IP-RailO 38.3, Section 1.1 IP-RailO 47.1, Section 3.2					
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI					

Full description:	**Title:**	Inhibited operability to isolate the ETCS on-board unit				
	Type of Requirement	Safety	Reliability/availability	Health	Environment	Technical compatibility
		X	-	-	-	-
	Scope of application	All vehicles equipped with ETCS in Switzerland.				
	Requirement	The means of isolating the ETCS on-board unit shall be configured in such a way that the unit cannot be isolated unintentionally (e.g. by operating a switch by mistake).				
	Reasons/explanation	Isolating an ETCS on-board unit poses a considerable hazard. Isolation results in the train no longer being supervised by the ETCS on-board unit respectively aits brake interventionis noneffective..				
	Applies to	2.2.2 +	2.3.0d	3.4.0	3.6.0	
		X	X	X	X	
	Regulation classification	Group C				
	Validity period	unlimited				
Current applicable norms in Switzerland:						
Test specification for certificate of conformity:						

Notified National Technical Rules (NNTRs)

ID	**CH-TSI LOC&PAS-026**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016

Title:	**SIGNUM/ZUB not permitted on vehicles with ERTMS/ETCS Baseline 3**		
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section	**Address:**	3003 Bern Switzerland
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch		

Referenced TSI article:	Currently no corresponding requirements in TSI LOC&PAS.
Reference in Swiss regulation:	IP-RailO 38.3, Section 1.1 IP-RailO 47.1, Section 3.2
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI

Full description:

Title:	SIGNUM/ZUB not permitted on vehicles with ERTMS/ETCS Baseline 3					
Type of Requirement	Safety	Reliability/availability	Health	Environment	Technical compatibility	
	X	-	-	-	-	
Scope of application	All vehicles equipped with ETCS in Switzerland.					
Requirement	Vehicles equipped with an ETCS on-board unit with Baseline 3 shall not support a train control system specific to Switzerland (ETM, ZUB, SIGNUM).					
Reasons/explanation	Vehicles equipped with an ETCS on-board unit with Baseline 3 run in Switzerland with ETCS. Trackside is not equipped to allow such trains to switch to train control systems specific to Switzerland (SIGNUM/ZUB).					
Applies to	2.2.2 +	2.3.0d	3.4.0	3.6.0		
	-	-	X	X		
Regulation classification	Group C					
Validity period	unlimited					

Current applicable norms in Switzerland:	
Test specification for certificate of conformity:	

Notified National Technical Rules (NNTRs)

<table>
<tr><td>ID</td><td>CH-TSI LOC&PAS-027</td><td>State:</td><td>Switzerland</td><td>Status</td><td>Applicable</td><td>from:</td><td>July 2016</td></tr>
<tr><td>Title:</td><td colspan="7">Manual radio remote control in Shunting mode</td></tr>
<tr><td>Office responsible:</td><td colspan="4">Federal Office of Transport FOT
Approvals and Rules Section</td><td>Address:</td><td colspan="2">3003 Bern
Switzerland</td></tr>
<tr><td>E-mail:</td><td colspan="7">_BAV-WeiterentwicklungRegelwerke@bav.admin.ch</td></tr>
<tr><td colspan="2">Referenced TSI article:</td><td colspan="6">Currently no corresponding requirements in TSI LOC&PAS.</td></tr>
<tr><td colspan="2">Reference in Swiss regulation:</td><td colspan="6">IP-RailO 38.3, Section 1.1
IP-RailO 47.1, Section 3.2</td></tr>
<tr><td colspan="2">Current NNTR classification:</td><td colspan="6">☐ NNTR on an ‘open point’ in the TSI
☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI
☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI</td></tr>
<tr><td colspan="2" rowspan="8">Full description:</td><td>Title:</td><td colspan="5">Manual radio remote control in Shunting mode</td></tr>
<tr><td rowspan="2">Type of Requirement</td><td>Safety</td><td>Reliability/availability</td><td>Health</td><td>Environment</td><td>Technical compatibility</td></tr>
<tr><td>X</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Scope of application</td><td colspan="5">All vehicles equipped with ETCS in Switzerland.</td></tr>
<tr><td>Requirement</td><td colspan="5">If a vehicle is equipped with radio remote control that permits external manual operation of the vehicle, the following requirements apply:
1. It shall only be possible to activate the radio remote control when the ETCS on-board unit is in Shunting mode (SH).
2. If the ETCS on-board unit leaves Shunting mode whilst the radio remote control is active, the vehicle shall be brought to an immediate standstill by technical means.</td></tr>
<tr><td>Reasons/explanation</td><td colspan="5">A range of risks relating to shunting movements on ETCS L2 routes can only be mitigated by requiring the ETCS OBU to be in Shunting mode (SH).</td></tr>
<tr><td rowspan="2">Applies to</td><td>2.2.2 +</td><td>2.3.0d</td><td>3.4.0</td><td>3.6.0</td><td></td></tr>
<tr><td>X</td><td>X</td><td>X</td><td>X</td><td></td></tr>
<tr><td>Regulation classification</td><td colspan="5">Group C</td></tr>
<tr><td>Validity period</td><td colspan="5">unlimited</td></tr>
<tr><td colspan="2">Current applicable norms in Switzerland:</td><td colspan="6"></td></tr>
<tr><td colspan="2">Test specification for certificate of conformity:</td><td colspan="6"></td></tr>
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Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-028**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016

Title:	Required safety considerations		
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section	**Address:**	3003 Bern SWITZERLAND
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch		

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) 4.2.9.3.1, 6.2.2.2.2 EN 15273-2
Reference in Swiss regulation:	RailO 18/47 IP 18/47 1N – 11N
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	Justification according to EN 15273 A-derogation (see page 2). However, entrance doors that utilise the conditions in UIC leaflet 560, sections 1.1.4 to 1.1.4.3 are permitted.
Current applicable norms in Switzerland:	The norms set out in the implementing provisions of the Railway Ordinance (version 01.07.2016) apply. Please also refer to EN 15273:2013 (esp. Swiss A-derogation) and UIC leaflets 505 and 506 and esp. 560.
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation referenced above and the infrastructure manager's specifications.

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-029**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	Safety against derailment Y/Q						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern SWITZERLAND	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	TSI LOC&PAS (1302/2014/EU) Appendix J.2 and ERA/TD2012-17 INT rev 3.0, clause 4.3.10
Reference in Swiss regulation:	RailO Art. 2, para. 1
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	The alternative verification procedure on respect of coefficient Y/Q in accordance with clause 4.3.10, ERA/TD2012-17 INT rev 3.0 may not be applied in Switzerland for vehicles which are the subject of this TSI.
Current applicable norms in Switzerland:	EN 14363:2005.
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation referenced above and the infrastructure manager's specifications.

Notified national technical rules (NNTR)

ID	**CH-TSI LOC&PAS-030**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	Use of braking systems without static friction						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section			**Address:**		3003 Bern SWITZERLAND	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	LOC&PAS TSI (1302/2014/EU) Section 4.2.4.8.3. Eddy current track brake Section 4.2.7.2.2
Reference in Swiss regulation:	IP- RailO on Art. 31, para. 2.1 R RTE 220.41 RailO Art. 47, (esp. para. 1)
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☒ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☐ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI
Full description:	The use of braking systems independent of wheel-rail adhesion conditions (e.g. eddy current track brakes, magnetic track brakes) for service braking is not permissible in Switzerland. The superstructural constructions used in Switzerland and calculated according to IP-RailO on Art. 31, para. 2.1 are not designed for the additional forces and temperatures generated by these braking systems. The weldability limits of long welded rails set according to the stability calculation (IP-RailO on Art. 31, para. 5) (set for Switzerland in R RTE 200.41) do not take account of the additional forces and temperatures generated by these braking systems. Magnetic brakes for emergency braking as required by INF TSI are permitted.
Current applicable norms in Switzerland:	The norms set out in the implementing provisions of the Railway Ordinance (version 01.07.2016) apply. Please also refer to R RTE 220.41.
Test specification for certificate of conformity:	The conformity assessment is based on the requirements and norms in the sections in the Swiss regulation referenced above.

Notified National Technical Rules (NNTRs)

ID	**CH-TSI LOC&PAS-031**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	**Safe traction cut-off**						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section			**Address:**		3003 Bern Switzerland	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	There is currently no corresponding requirement in TSI LOC&PAS for multi-unit traction vehicles, double-headed trains or traction vehicles at the rear of the train.
Reference in Swiss regulation:	IP-RailO 38.3, Section 1.1 IP-RailO 47.1, Section 3.2 IP-RailO 50.1, Section 13.2
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI

Full description:

Title:	Safe traction cut-off				
Type of Requirement	Safety	Reliability/availability	Health	Environment	Technical compatibility
	X	-	-	-	-
Applicability	All vehicles equipped with ETCS in Switzerland.				
Requirement	It shall be ensured that when the emergency brake is activated by the ETCS on-board unit (OBU) on the leading vehicle, traction is also cut-off on the non-leading vehicles. The tolerated unavailability for traction cut-off on the leading vehicle and for multi-unit traction vehicles is set at $1*10^{-7}$. On manned non-leading traction vehicles (ETCS on-board unit in Non Leading mode), it shall be ensured by technical means that the traction is cut off if the leading vehicle reduces the pressure in the main brake pipe. The tolerated unavailability is set at $1*10^{-5}$. Traction cut-off comprises the whole chain, from the OBU to the unit which performs the traction cut-off on the vehicle.				
Reasons/explanation	In the case of the emergency brake has been activated, safe traction cut-off must also be ensured when trains are running as multi-unit traction vehicles or a traction vehicle is at the rear of the train as a Push-locomotive or Tail-locomotive. Traction is normally cut-off 'safely' via two channels, whereby one channel takes effect via pressure reduction in the main pipe. The multi-unit control or the train driver (in the case of a booster locomotive, Q-locomotive or double-headed train) may act as the second channel. A deviation from this two-channel system is only permitted if it can be shown that other measures with an equivalent degree of safety are in place and therefore that the train will stop safely before the point of danger. The vehicle integrator (SiNa VI) or vehicle keeper (SiNa II) is responsible for demonstrating that the requirement is met or deviation				

		with equivalent measures is in place. For this purpose, the corresponding regulations must exist, and these must be bindingly applied even if the vehicle keeper is not a railway undertaking.				
	Applies to	2.2.2 +	2.3.0d	3.4.0	3.6.0	
		X	X	X	X	
	Regulation classification	Group C				
	Validity period	unlimited				
Current applicable norms in Switzerland:						
Test specification for certificate of conformity:						

Notified National Technical Rules (NNTRs)

ID	**CH-TSI LOC&PAS-034**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	**Automatic transmission of train data on multiple units**						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern Switzerland	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						

Referenced TSI article:	Currently no corresponding requirements in TSI LOC&PAS.					
Reference in Swiss regulation:	IP-RailO 38.3, Section 1.1 IP-RailO 47.1, Section 3.2					
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI					
Full description:	**Title:**	Automatic transmission of train data on train sets				
	Type of Requirement	Safety	Reliability/availability	Health	Environment	Technical compatibility
		X	-	-	-	-
	Scope of application	All multiple units equipped with ETCS in Switzerland.				
	Requirement	New train sets shall automatically determine the required train data (Subset-026, Section 3.18.3) and transmit it via train interface (TI) to the ETCS on-board unit (OBU).				
	Reasons/explanation	When train data are automatically determined and transmitted to the OBU, this reduces the risk of the train data being entered on the OBU incorrectly by the train driver. Multiple units retrofitted with an OBU should automatically determine the required train data (Subset-026, Section 3.18.3) and transmit it via TI to the OBU. Requirement relates to CH-TSI CCS-019.				
	Applies to	2.2.2 +	2.3.0d	3.4.0	3.6.0	
		X	X	X	X	
	Regulation classification	Group C				
	Validity period	unlimited				
Current applicable norms in Switzerland:						
Test specification for certificate of conformity:						

Notified National Technical Rules (NNTRs)

ID	**CH-TSI LOC&PAS-035**	**State:**	Switzerland	**Status**	**Applicable**	**from:**	July 2016
Title:	**Sufficient braking performance during emergency braking**						
Office responsible:	Federal Office of Transport FOT Approvals and Rules Section				**Address:**	3003 Bern Switzerland	
E-mail:	_BAV-WeiterentwicklungRegelwerke@bav.admin.ch						
Referenced TSI article:	Currently no corresponding requirements in TSI CCS						
Reference in Swiss regulation:	IP-RailO 38.3, Section 1.1 IP-RailO 47.1, Section 3.2						
Current NNTR classification:	☐ NNTR on an 'open point' in the TSI ☐ NNTR due to difference between Swiss regulation and corresponding requirements in the TSI ☒ NNTR due to additional requirements in Swiss regulation without equivalent in the TSI						

Full description:

Title:	Sufficient braking performance during emergency braking					
Type of Requirement	Safety	Reliability/availability	Health	Environment	Technical compatibility	
	X	-	-	-	-	
Scope of application	All vehicles in Switzerland equipped with an ETCS on-board unit.					
Requirement	It shall be ensured that the effective braking means during emergency braking can achieve at least the same braking performance as the safe braking means that have been considered in the calculation of ETCS braking curves. In particular, the following scenario shall be taken into account for trains whose number of powered axles is greater than 20 % of the number of all axles, and for all trains with a maximum speed > 160 km/h: If the regenerative brake is used during emergency braking from a high speed, it shall be demonstrated by how much the braking distance increases if the catenary voltage fails. This increase in braking distance shall be taken into account when braking performance is calculated. The braking effect of the emergency braking activated by the train control system in the leading traction vehicle shall not be reduced by either the leading vehicle or by other vehicles in the train (e.g. due to refilling of the main brake pipe). This requirement applies independent of the ETCS mode of the non-leading vehicles. The emergency brake application shall meet the following value: Tolerated unavailability: 1*10-7 The emergency brake application comprises the entire pathway from the output by the ETCS on-board unit to the lowering of the air pressure in the main brake pipe on the vehicle equipped with the ETCS on-board unit.					
Reasons/explanation	If the braking distance is increased in case of an emergency brake this may lead to a hazardous situation. Requirement relates to CH-TSI CCS-007.					
Applies to	2.2.2 +	2.3.0d	3.4.0	3.6.0		
	X	X	X	X		

	Regulation classification	Group C
	Validity period	unlimited
Current applicable norms in Switzerland:		
Test specification for certificate of conformity:		