

Consultation comments and responses

Document Title: AC Energy Subsystem and Interfaces to Rolling Stock Subsystem.

Document number: GMRT2111

Consultation closing date: 07 October 2022

1. Responders to consultation

No	Name	Company
1	Garry Keenor	Akins
2	Robert Wilkins	Mottmac
3	Richard Ward	Angel Trains
4	Richard Stainton (on behalf of Network Rail)	Network Rail
5	Richard Kidman	Eversholt
6	Colin Place	AGIS Engineering
7	Anne Watters	Amey
8	Franco Cataldo	Alstom Group

2. Summary of comments

Code	Description	Total
-	Consulted	2
CE	Critical errors	5
ED	Editorial errors	9
ТҮ	Typographical errors	2
ОВ	Observations	29
-	Total comments returned	47

Classification codes for a way forward:

- DC Document change
- NC No change

3. Collated consultation comments and responses

No	Page	Clause	Comment	Suggestion	Ву	Way forward	Page	Clause	Response
1	10	G2.1.1	"which includes a minimum reduced OCL height when surge arrestors are used." This is confusing.	Suggest change to "which includes a reduced minimum OCL height when surge arrestors are used."	1	DC	10	G 2.1.1	(ED) The star suggested ch
2	10	G2.1.1	"provided a vehicle complies with the requirements set out in GMRT2173 and the pantograph gauging process set out in RIS-2773-RST." There is no pantograph gauging process in RIS-2773-RST.		1	DC	10	G 2.1.1	(ED) The con change is dif interpreted pantograph included as p
3	13	3.3	The requirements for APC magnets are not directly written into the NTSN other than the requirement to bring the Power Consumption to 0. Parts of this section infers the use of APC Magnets where other APCO technologies such as the balise system may become a more reliable system in the future.	Parts of the APCO operation directly relating to APC Magnet operation should be moved to RIS-2715-RST	2	NC	13	3.3	(OB) The sta of this comm recognised s systems rem power chang is however m ETCS and ba mainline.
4	14	3.3	Within the diagram the value to show the relationship between the rail head and APC magnet is not shown therefore the vertical relationship between the APC magnet and the receiver is not fully defined. (also noted in GLRT 1210)	As per GIRT 7073 the 'Z' value of 45 +/-6mm should be included into this diagram.	2	NC	13	3.3	(OB) The sta of this comm where GMR ⁻ makes refere including dir distance abc has no beari
5	10	N/A	Referring to GM/RT 2111 Issue 2, section 2.1 "Short Circuit Fault Protection" is lost. See comment re. GL/RT 1210.		3	NC	-	-	(OB) The sta of this comm requires com in section 11 electrical has specifically s equivalent, a provided to to support g 50153:2014-
6	10	G 2.2.3	LOC&PAS NTSN clause 4.2.11.6 & 7.3.2.24 (issue sent for consultation in August) referenced do not contain the information contained in GMRT2111 issue 2 clause 2.4.1 (interlocking and electrical safety info.). What is the rationale for this and where have the requirements been transferred to?		3	NC	-	-	(OB) The sta of this comm comment ha remains vali- compatibility considered t in place for s



ndard has been amended and incorporates the hange(s).

mment received has been accepted but the standard fferent to the suggestion because it has been that the issue is with the word 'process', rather than gauging being covered by RIS-2773-RST, as it is part 3 in this standard.

andard has not been amended following the receipt ment because APC is the current, nationally system for power change over. As ETCS or balise main to be deployed across GB, APC must remain for ge over consistency across all networks. This subject moted for regular review and will be amended as ilise systems become more prominent on the GB

Indard has not been amended following the receipt nent because this value relates to the APC magnet, T2111 is only referring to the APC receiver and ence to GLRT1210 for all APC magnet requirements, mensions. The receiver is only required to be a set ove rail level, therefore the APC magnet Z dimension ing on this.

andard has not been amended following the receipt nent because the LOC&PAS NTSN in clause 4.2.8.4 npliance with the electrical protection requirements 1 of BS EN 50388:2012 for protection against zards which cover short circuit fault protection, section 11.2. The previous requirement is considered and this prevents means (other than bonding) being protect against short circuits. Converted to guidance good practice with original reference to BS EN +A2:2020 retained.

andard has not been amended following the receipt nent because the requirement questioned in this as been migrated to RIS-2715-RST issue one. It d as a requirement for GB mainline to support y with shore supplies at a route level but is not to be a national technical rule on the basis that it is safety purposes.

No	Page	Clause	Comment	Suggestion	Ву	Way forward	Page	Clause	Response
7	14	N/A	Referring to GM/RT 2111 Issue 2, section 3.6 "Regenerative braking requirements". Where is the information detailing low level cut out levels for receptiveness of the OCL now contained? It is noted figures are included in RIS-1853-ENE but there is no apparent link to regen braking. RIS-2715-RST appears to contain a maximum range of cut-out for regen only – apologies if this is included and has been missed when reviewing.		3	NC	-	-	(OB) The sta of this comm receptivenes contained in Inclusion of duplicate BS LOC&PAS N ^T have already (as was in G LOC&PAS N ^T preventing r Upper limits the adjustat
8	19	4	Part 4 "Mechanical and pantograph bonding requirements for 25 kV electric rail vehicles". Within this section, reference to how the collector equipment and incoming HV circuits must be equipotentially bonded back to running rail potential has been deleted w.r.t. Issue 2, presumably as it is now in RIS-2715- RST. The title still contains bonding, but appears not to contain any relevant information (apologies if I've missed something in my brief review).	Assuming the specific rationale for this omission is that the information is now ensconced in the RIS document, should the title be changed accordingly or alternatively a reference be added under the original sub-title to link to the RIS document?	3	NC	-	-	(OB) The sta of this comm comment ha remains vali bonding of p reference ha two as this v superseded
9			Part 4 "Mechanical and pantograph bonding requirements for 25 kV electric rail vehicles". Information concerning regulation of pantograph spacing (for instance on coupled units setting up perturbations in the OCL) has been removed. Has the detail formerly in this section (at Issue 2) been transferred wholly to report T1244 (sub-referenced in RIS-1853- ENE) or into RIS-2715-RST?	If the latter is the case, should the reference(s) be added into 2111 for completeness?	3	NC	-	-	(OB) The sta of this comm RIS-2715-RS technical rul for pantogra compatibilit
10	11		Referring to GM/RT 2111 Issue 2, section 2.3 "Protection of personnel - warning line"	Given this information is now located in RIS-2715-RST, should a specific reference be made to link the two under the original 2111 title?	3	NC	-	-	(OB) The sta of this comm of personne changed to ' is not just ar would result document, v
11		3.2.1	3.2.1 Traction unit current (Imax) shall be no greater than 300 A, except where higher values are permitted on the GB mainline 25 kV ac electrified railway as set out in the Register of Infrastructure (RINF).	traction unit term does not align with BS EN 50388 (or GLRT1210) use term Trainset	4	DC	12	3.2.1	(OB) The sta suggested cl
12		3.3.5	The dimension is not clear	The along-track longitudinal distance between the centre line of the APC receiver and the centre line of its associated pantograph head shall not exceed 7.75 m.	4	DC	14	3.3.6	(OB) The sta suggested cl



andard has not been amended following the receipt nent because the low cut out levels for ss of regenerative braking to the OCL are already n BS EN 50388-1:2022 part 12.2, defined as Umin2. low cut out levels in GMRT2111 issue three would EN 50388-1:2022 in part, but also conflict with the TSN where requirements for regenerative braking y been set out and including lower values for voltage MRT2111 issue two) is more onerous than the TSN sets out, which is not permitted, as well as regeneration into the OCL when it is most needed. Is for regeneration have been retained, along with ole setting, to support technical compatible at route en rolling stock operating in the same OCL section.

andard has not been amended following the receipt ment because the requirement questioned in this as been migrated to RIS-2715-RST issue one. It id as a requirement for GB mainline to support the pantographs to running rail potential, but no as been made in RIS-2715-RST to GMRT2111 issue would result in the inclusion of a reference to a document, which will be confusing to industry.

andard has not been amended following the receipt ment because pantograph spacing is now covered in iT under part 4.2. This is not considered a national le as different routes have different requirements aph spacing, so is more in line with route ty.

Indard has not been amended following the receipt nent because the original title which was 'Protection I - warning line' was misleading and therefore 'warning line' only in RIS-2715-RST. The warning line n indicator for personnel. The suggestion made t in the inclusion of a reference to a superseded which will be confusing to industry.

indard has been amended and incorporates the hange(s).

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No	Page	Clause	Comment	Suggestion	Ву	Way forward	Page	Clause	Response
13		3.6.1	It is difficult to see how any circuit breaker could all the requirement of BS EN 60077- 4:2003. This requirement is out of scope of the RGS, as there is no specific case. The LOC&PASS NTSN Appendix J, index 70 specifies that circuit breaker should be specified in accordance with EN 50388. This specifies EN 60077-2	Delete requirements	4	NC	17	3.6.1	(OB) The sta of this comm EN 50388-1: current LOC is not possib requirement 50388-1:202 currently se retained fro is updated, t
14	17	3.6.2	The fault current clearance shall also take into consideration of the possible adverse impact on other systems, such as the lineside signalling and telecoms systems in the associated area.	Add text: 'The fault current clearance shall also take into consideration of the possible adverse impact on other systems, such as the lineside signalling and telecoms systems in the affected area.'	4	DC	18	G 3.6.8	(OB) The con change is dif included as current clea adverse imp and telecom
15		4	Requirements are needed for all sections. Significant issues are arising around requirements for pan force in assessment of projects for assurance and in vehicle introduction. This is causing cost and delay.	Requirements were previously present in all sections; this should be inserted into a RIS for cases of legacy system interaction which are not covered in this or other standards currently.	4	NC	22/23	4.6 and 4.7	(OB) The cor change is dif clause 4.2.8. contact forc pantograph requirement NTSN. Guida
16	12	3.2.1	The term 'Traction unit current' could suggest that the total train current could be expected to be greater than 300 A rms, given that a motor coach or individual locomotive is defined as a traction unit in the definitions. Also noting that GLRT1210 Issue 3 draft uses the term 'train current' for the corresponding requirement.	Consider amending 'Traction unit current' to; 'Total current drawn by traction units in the train formation'?	5	DC	12	3.2.1	(OB) The cor change is dif made was to covers the s
17	13	3.3.4	A minor point, but should the text or figure 1 clarify that two APC magnets are located at corresponding positions to the outside of both running rails so that one APC receiver is required per pantograph?	Provide additional clarification within document?	5	NC	-	-	(OB) The sta of this comm relating to tl including thi standards. R further infor
18	8	1.2.1.1	compatibility to the ac interface	compatibility WITH the ac interface	6	DC	8	1.2.1.1	(TY) The star suggested ch
19	10	2.2	Shore supplies- as written, this document defines shore supply requirements but as per section 1.1.1, these only apply to rolling stock which operates over the GB 25kV system. Presumably three phase shore supplies fitted to (say) diesel trains which only operate over non-electrified lines (if there is such a thing), don't have to comply with this clause. Seems rather odd.	Confirm this is the intention. It seems more sensible to have a separate document which deals with shore supplies, applicable to the whole railway not just 25kV.	6	NC	-	-	(OB) The sta of this comm supplies is b under part 2 operating un diesel vehicl



andard has not been amended following the receipt ment because the comment includes reference to BS :2022, which is not the version included in the &PAS NTSN, which is BS EN 50388-1:2012. Where it ole to conflict with the existing LOC&PAS NTSN ts, and therefore not directly reference BS EN 22 part 11 at present as this differs to what is t out, the reference to BS EN 60077-4:2003 has been m GMRT2111 issue two. When the LOC&PAS NTSN this reference will be removed.

mment received has been accepted but the standard fferent to the suggestion because it has been guidance, not as a requirement. This reads "Fault rrance can also take into consideration the possible bact on other systems, such as the lineside signalling hs systems in the affected area."

mment received has been accepted but the standard fferent to the suggestion because LOC&PAS NTSN .2.9.5 sets out requirements for pantograph static e for ICs, and 4.2.8.2.9.6 sets out requirements for contact force and dynamic behaviour. To include ts on this subject would be a repeating the LOC&PAS ance has been included to support the NTSN.

mment received has been accepted but the standard fferent to the suggestion because another comment o change the term 'traction unit' to 'trainset', which suggestion made.

Indard has not been amended following the receipt nent because GLRT1210 sets this out. As this is he magnet, which is not discussed in GMRT2111, is may lead to differences between the two Reference to GLRT1210 is given in GMRT2111 for rmation on APC magnets.

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andard has not been amended following the receipt ment because a separate document for shore reyond the scope of this project. The requirements 2 of this document are relevant to all vehicles moder the 25 kV ac electrified railway, which includes les.

No	Page	Clause	Comment	Suggestion	Ву	Way forward	Page	Clause	Response
20	12	3.2.1	This clause says that 300A is the traction unit current. Clause 2.1.1.1 of GLRT1210 says that 300A is the maximum current per train and references (G2.1.1.7) clause 3.2 of BS EN 50388-1:2022, which defines various configurations making up a 'train set'. A traction unit is defined in EN50388 as a 'locomotive, motor coach or train-unit'. Clause 3.2 of EN50388 says that one EMU is a Traction Unit, so the 300A limit can be taken to apply to one EMU (or even one motor coach). This is surely not the intention.	Clarify exactly what the 300A limit applies to and have the same definition in both standards. Use of the term 'traction unit' is too vague in this context because it has several possible meanings.	6	DC	12	3.2.1	(ED) The sta suggested c
21	13	3.3.1	'information on the ground' seems rather vague. Needs more precise wording.	'information provided by signals from the APC or ETCS system' or similar.	6	DC	13	3.3.2	(OB) The sta suggested c
22	13	3.3.2	In GLRT1210 the upper speed limit for use of APC is 250km/h not 200km/h	Both standards should use the same speed.	6	DC	13	3.3.1	(TY) The star suggested c
23	13	3.3.3	I don't think this section mentions anywhere that the same signal opens and closes the circuit breaker, section 3.3.3 only mentions opening the circuit breaker.	Clarify the sequence of operation of the system- one magnet to open, second magnet within a certain time to reclose. This is provided in G.3.3.15 but the whole sequence should be clearly stated as a requirement, not just guidance.	6	NC	-	-	(OB) The sta suggested cl
24	13	3.3.3	The term 'location trigger' is not defined.	Why not just use 'APC magnet' as per Figure 1?	6	DC	13	3.3.3	(ED) The sta suggested cl
25	14	3.3.7/ 3.3.8	What does 'detect the magnetic flux presence' actually mean? Is this to do with the APC receiver closing its contacts? No proper explanation is provided for these requirements. I think they are irrelevant provided the magnet is properly detected (that's why the shape of the magnetic field needs to be defined- see below) and the 150ms time reaction time is met- this is an over-specification of something internal to the vehicle.	Remove these requirements or make them guidance, if they are to remain define precisely what is meant by 'detection of the magnetic flux presence' and explain what the requirement is for.	6	DC	14	3.3.8 and 3.3.9	(ED) The sta suggested cl
26	14	3.3.9	It would be useful here to reference the defined shape of the magnetic field from the magnet, from GLRT1210.	Add a reference.	6	NC	-	-	(OB) The sta of this comm GLRT1210 in
27	14	G3.3.10	'Phase section' is not defined	Add to definitions	6	DC	14	G 3.3.11	(ED) The cor change is dir re-written to
28	14	G3.3.10	There seems to be a requirement missing here. There used to be a clause (3.9 in GMRT2111 issue 2) which required pantographs not to be interconnected.	Put this clause back in.	6	NC	-	-	(OB) The sta of this comm movement b without bric duplicating t
29	15	G3.3.11	'electric vehicle' is not a defined term.	I think this is a good place to use 'traction unit', then 'electric vehicle' isn't needed.	6	DC	16	G 3.3.12	(OB) The sta suggested c



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andard has not been amended following the receipt ment because reference is already given to n clause G 3.3.30 in its entirety.

mment received has been accepted but the standard ifferent to the suggestion as the guidance has been to be clearer and removes the term 'phase section'.

andard has not been amended following the receipt ment because LOC&PAS 4.2.8.2.9.8(1) requires between either system or phase separation sections dging. To add this clause back in would result in the LOC&PAS NTSN.

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No	Page	Clause	Comment	Suggestion	Ву	Way forward	Page	Clause	Response
30	15	G3.3.16	This and various other sections use the term 'neutral section' instead of 'phase separation' seemingly at random.	Both these terms need to be defined in the list of definitions and a check made to make sure they are used consistently.	6	DC	15	G 3.3.17	(ED) The sta suggested c
31	15	G3.3.16	Compatibility between the rail vehicle and what? In general this clause seems disjointed.	Complete the statement.	6	DC	15	G 3.3.18	(OB) The sta suggested cl
32	16	G3.3.27	This is completely out of context and more or less irrelevant to neutral sections. It belongs in another section.	Move to a more appropriate location.	6	DC	12	G 3.1.7	(OB) The sta suggested cl
33	21	G3.6.3	Appendix A does not give guidance, it just lists other sections where guidance can be found.	Correct this statement.	6	DC	17	G 3.6.3	(ED) The sta suggested cl
34	22	G4.5.7	So is there a specific requirement not to have such an indication? There is no mention of indications anywhere else.		6	DC	21	G 4.5.7	(OB) The con change is dir unclear. This employing t practice, ho type of indic be set out ir requirement interface wi design requi
35		G4.5.13	This statement does not make sense.	Reword: One means of detecting extensive damage to carbons is to pressurise the pantograph head and use a drop in pressure to trigger the auto-drop system.	6	DC	22	G 4.5.12	(OB) The sta suggested cl
36	13	3.3.4 Figure 1	Partially duplicates information contained in GIRT7073 Section A.4.	Add cross-reference to GIRT7073.	7	NC	-	-	(OB) The sta of this comn This is refere GLRT1210 fc
37	16	G 3.3.26 Table 2	APC magnet spacing would be better defined instead/as well in the form of a formula, to allow for speeds that aren't a multiple of 20mph.	Add formula: APC magnet spacing in metres = 10 + (0.2 x line speed mph), max = 100m.	7	DC	-	-	(OB) The con change is dif to APC magn and included deleted. Ref
38	16	G 3.3.26 Table 2	Column heading states "Line speed mph (km/h)", but line speeds appear to be quoted in mph only.	Omit km/h from heading, or add km/h speeds to table content.	7	NC	-	-	(ED) The sta of this comm Reference to
39	16	G 3.3.30	As GLRT1210 sets out requirements and guidance for trackside APC magnets, the information included in GMRT2111 is potentially conflicting.	Clarify how/why the information on APC magnets is split between the two.	7	DC	16	G 3.3.30	(OB) The sta suggested cl guidance cla reference to



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mment received has been accepted but the standard fferent to the suggestion because the guidance was s has been redrafted to be clear and indicates that his type of indication would be considered bad wever no requirement is set out to describe any cation regarding pantograph lowering as this cannot n a national technical rule. Moreover, setting out this t in RIS-2715-RST as it does not relate to the th the AC energy subsystem but rather specific irement onboard rolling stock.

indard has been amended and incorporates the hange(s).

Indard has not been amended following the receipt nent because GIRT7073 relates to the APC magnet. enced by GLRT1210, and GMRT2111 refers to or all APC magnet requirements.

mment received has been accepted but the standard fferent to the suggestion because this subject relates net spacing, which is included in GLRT1210 already, d in GMRT2111 erroneously and has therefore been ference will be made instead to GLRT1210.

ndard has not been amended following the receipt nent because the table has now been deleted. o GLRT1210 is now provided instead.

andard has been amended and incorporates the hange(s). Note that this involves the removal of ause G 3.3.26 which is covered instead with o GLRT1210 in G 3.3.30.

No	Page	Clause	Comment	Suggestion	Ву	Way forward	Page	Clause	Response
40	10	2.1	This section is very confusing. The approach to electrical clearances has been managed via route compatibility, however, there is/was an opportunity to provide some further clarity on this interface through the standard.	Include a requirement for the minimum wire height at which the rolling stock achieves electrical clearance to the OCL (based on the electrical clearance values included in the previous standards).	8	DC	10	G 2.1.5	(CE) The cor change is dir consultatior recommend GMRT2111
			At an NTR level all that can be done is to specify the minimum wire height at which electrical clearances can be achieved for new rolling stock. This could be defined through the NTR and then recorded in the Technical File. Through route compatibility this minimum wire height can then be cross- checked with the wire height on the intended route of operation.						"When carry against wire practice in s at least 175 the OCL unly risk assessm clearance va GERT8025 b curvature of
			values have been removed, as these values could be used to define the minimum wire height at which the rolling stock provides sufficient electrical clearance.						
41	10	2.2.2	Are legacy shore supplies included on the mainline network or in depot environments which are not in scope of RGSs/NTRs. If so it is not clear why it required to have 1000V shore supply via an NTR. This ought to be managed by contract.	Remove this requirement, or at least clarify that these requirements apply where such types of shore supply receptacles are required to be fitted. For example "Where 415V/1000V receptacles are fitted"	8	DC	10	2.2.1 and 2.2.2	(OB) The sta suggested cl
42	12	3.1.1	LOC&PAS NTSN 7.3.2.11 concerns permission for automatic regulation. The requirement to use EN50163:2004 is already present in the LOC&PAS NTSN through reference to ranges in ENE NTSN which in turns references EN50163. Annex B 4.1 is normative in any case for the United Kingdom, so why do we require this rule duplicated twice? This just adds unnecessary cost and review by third party assessment bodies.	Remove requirement and potentially add guidance on how the NTSN requires compliance to the ranges in EN50163, and in turn the EN requires compliance to Annex B 4.1 for the UK.	8	NC	-	-	(CE) The sta of this comm references t this does no Article 4 for NTSN part 7 therefore re
43	12	3.2	 This requirement is not appropriate as an NTR: It concerns route compatibility The RINF is not fully operational nor can it be relied upon Contradicts the approach outlined in the NTSN which is that the maximum current draw needs to be recorded in the technical documentation. This can then be used to support route compatibility assessment (and also commercial agreements regarding frequency of trains, service pattern etc). 	Delete requirement and potentially include guidance that current draw has historically been limited to 300A for traction units however higher limits are permitted where assessed through route compatibility assessment and vehicle change.	8	NC	-	-	(CE) The sta of this common on a maximu work propositechnical ration in a future r requirement



mment received has been accepted but the standard ifferent to the suggestion following further n with the consultee. Additional guidance has been ded by the consultee and will be included in issue three.

rying out absolute gauging for route compatibility e heights, particularly nonstandard heights, historic some parts of the industry has been to demonstrate is mm electrical clearance between the vehicle and less other mitigations have been identified through nent which have therefore permitted a reduced alue. A figure of 200 mm was previously set out in but this may not have taken into account the of the track."

andard has been amended and incorporates the change(s).

andard has not been amended following the receipt ment because where LOC&PAS NTSN clause 7.3.2.11 the ENE NTSN 4.2.3 for voltage and frequency limits, ot include BS EN 50163:2004 Annex B. ENE NTSN r UK specific cases requires them to be set out in ENE 7.4.2, which doesn't include this Annex. The NTR emains valid and is not duplicated.

Indard has not been amended following the receipt ment because it is not possible to reach consensus um train current value at this time. An additional sal is to be put forward which will review the tionale for this requirement and amendments made revision should it be discovered that the current t is either inaccurate or not required.

No	Page	Clause	Comment	Suggestion	Ву	Way forward	Page	Clause	Response
44	15	G 3.3.14 & G 3.3.20	Providing APC functionality via the trackside is an optional functional requirement in the CCS NTSN. Only where this function is provided via the ETCS trackside equipment do the requirements in the LOC&PAS NTSN become mandatory. This subtlety should be explained because as written the guidance suggests that APC via ETCS will become mandatory.	Provide clarification to guidance on this point.	8	DC	15	G 3.3.15 and G 3.3.21	(OB) The sta suggested cl
45	16	3.4	This duplicates what is in the LOC&PAS NTSN clause 4.2.8.2.9.8(1). This clause states that the train shall not bridge power supply systems. Therefore, there is already a requirement for units not to bridge between the AC and DC systems respectively. There is no benefit to duplicating this requirement as this just adds additional certification costs.	If necessary add guidance to support NTSN clause 4.2.8.2.9.8(1) to explain that this requirement includes ensuring the DC and AC supply systems are not bridged by the unit when passing through sections where both power supply systems are present.	8	NC	-	-	(CE) The star of this comm references E clauses set of for AC system remains vali linked throud discussed, the supplied frood different line
46	17	3.5	It is not clear how this requirement fulfils the scope of being an NTR; it does not fill a specific case or open point, nor is directly related to compatibility with legacy infrastructure. This requirement concerns safety which is not on its own within scope of being an NTR. Furthermore, requirements on electrical safety are required through reference to EN50153 which in turn references EN50122. This should therefore be managed through application of the NTSN, CSM RA and where required through route specific requirements via contract.	Remove requirement.	8	DC	16	G 3.5.1	(CE) The con change is dif out in the di changed to g
47	17	3.6	Open points within RGSs/NTRs are non- sensical. If an agreed requirement for the UK cannot be agreed then by definition no standard requirement exists, thus it makes no sense to include it in the RGS. This does not mean it is not appropriate to continue investigations to see if a requirement can be defined, however, this should not be managed by including an open point in RGS which provides uncertainty in how it should be managed from a certification perspective.	Remove requirement until open point can be closed. It's not clear exactly how compliance could be demonstrated or how a DeBo would assess this. We should not have subjective requirements.	8	NC	-	-	(OB) The sta of this comm technical rul in damage to inclusion is v fault current of values tha constant on be used to d range of value



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andard has not been amended following the receipt ment because LOC&PAS NTSN clause 4.2.8.2.9.8(1) ENE NTSN clauses 4.2.15 and 4.2.16. These ENE NTSN out requirements for phase and system separation ems only, and do not cover DC. This requirement lid as an NTR to prevent AC and DC systems being ugh a vehicle. Where power supply systems is this is regarding different AC systems that are om different substations, or those which may have a ne voltage.

mment received has been accepted but the standard ifferent to the suggestion where the requirement set lraft version GMRT2111 issue three has been guidance.

andard has not been amended following the receipt ment because open points remain valid in national ules. Removing the open point in question may result to the infrastructure and/or rolling stock and its warranted as train in-feed circuit breakers that clear hts are still required. Guidance is given on the range hat are likely for the open point (maximum time in the GB mainline 25 kV electrified railway) which can design main circuit breakers, potentially over the lues provided in guidance.