

Consultation comments and responses

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

Document number: RIS-1853-ENE

Consultation closing date: 07 October 2022

1. Responders to consultation

No	Name	Company
1	Garry Keenor	Akins
2	Robert Wilkins	Mott MacDonald
3	Richard Stainton (For Network Rail)	Network Rail
4	Thomas Palfreyman	WSP
5	Colin Place	AGIS Engineering
6	Anne Watters	Amey
7	Simon Skinner	Powerlines

2. Summary of comments

Code	Description	Total
-	Consulted	7
CE	Critical errors	4
ED	Editorial errors	12
TY	Typographical errors	5
OB	Observations	18
-	Total comments returned	39

Classification codes for a way forward:

- DC – Document change
- NC – No change

3. Collated consultation comments and responses

No	Page	Clause	Comment	Suggestion	By	Way forward	Page	Clause	Response
1	13	G5.2.9b	"Requirements for calculating the minimum response time (MRT) of lineside operational signs." Determination of MRT will assist in defining a compliant position of the signage to deliver a minimum reading time. It will not help OCL designers to determine how far away from the neutral section to place the signs, since this requires a definition of the time required for the driver to take the actions that the signage requires of them, e.g. shutting off power. Guidance is needed on the along-track separation of the sign from the neutral section.		1	DC	13	G5.2.10	(OB) Suggested change has been incorporated. Further guidance included based on typical spacing of 1.6 km. See comment no. 36
2	12	G.5.1.5	Guidance suggests the letters on plates indicate an Electrical Control Room Area. In fact, they historically represent a route area and do not indicate which ECR controls the OCS.	Amend to <i>"Structure identification plates historically consist of letters representing a Route Code,...."</i>	2	DC	12	G.5.1.5	(ED) Text has been updated to address the comment. .See comment no.19.
3	13	G.5.2.7	Sign AJ02 in practice is usually installed at the structure before the phase separation rather than at the APC magnet. The magnet is usually only around 30m from the phase separation but there are odd situations where it is located up to 90m away from the installation.	Amend to something like <i>"It is good practice to locate sign AJ02 either at the preceding structure or adjacent to the automatic power control magnet at the start of the OCL phase separation section."</i>	2	DC	13	G5.2.7	(ED) Suggested change has been incorporated
4	15	G A.1.1	The reference to "existing lines" with respect to the UK-specific low voltage limits carried across from BS EN 50388-1:2022 seems open to misinterpretation as existing lines without electrification which are then electrified and hence to which these limits should then be applied. It is assumed that this isn't the intention.	Amend to use the term "existing networks" as per the referenced standard which would clarify that the limits apply to existing electrification only.	2	DC	15	GA.1.1	(ED) Text has been updated to address the comment
5	15	G A.1.1	Refs. 1.2 and 1.3 in the table are both labelled Umax1.	Correct ref. 1.3 to refer to Umax2.	2	DC	15	GA.1.1	(TY) Suggested change has been incorporated
6	7	2.1	The guidance included here does not include the previous indication from G 2.1.4 of GLGN1610 that limitation in Umax2 may be sought where required for compatibility with existing vehicles etc. Was this intentional?	Clarify, or add.	2	NC	7	2.1	(OB) The requirement in GLRT1210 issue 2 was proposed for removal due to being a duplication of the ENE NTSN. Deviations are no longer possible as this aspect is outside the scope of an RGS. However, the exemption process is available, see GLRT1210, issue three clause 5.6.2.

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7	7	2.2	The guidance included here does not include the indication previously give in clause G 2.1.9 of GLGN1610 on wider systems integration issues arising from the frequency range limits set out. Was this intentional?	Clarify, or add.	2	NC	7	2.2	(OB) Frequency range in exceptional circumstances are covered and clarified by the latest version of BS EN 50163:2004+A3:2022. Guidance on the interaction between traction power supply and CCS assets are removed due to being out of scope of this RIS.
8	7-8	2.3	The guidance included here does not include much, if anything from that on short circuit levels and durations particularly which was previously provided in GLGN1610. Was this intentional?	Clarify, or add.	2	NC	7-8	2.3	(OB) Short circuit fault characteristics are specified in the ENE NTSN and EN 50388-1:2022 and it is intended that these are applied for technical compatibility. Reference is made to RSSB T1001 project for further guidance on short circuit fault characteristics and bonding.
9	5	1.1.1	A single subsystem can't be all of new, renewed and upgraded.	... new, renewed and upgraded (ac) energy subsystems.	3	DC	5	1.1.1	(TY) Text has been updated to address the comment
10	5	1.1.5	<i>'This document also contains an informative annex that summarises the main ac system characteristics for rolling stock compatibility.'</i> But it does not cover the harmonic frequency related information for rolling stock compatibility and the compatibility with signalling and telecoms systems.	Add text: 'It does not cover the harmonic frequency related information for rolling stock compatibility and the compatibility with other interfaces such as signalling and telecoms systems.'	3	DC	5	1.1.5	(OB) Suggested change has been incorporated. See comment no. 25.
11	7	G2.1.3	<i>'Appendix A sets out a summary of ac system characteristic related to the contact line voltage'.</i> The relevant items are focused on fundamental frequency of the ac traction power supply systems. The harmonics overvoltage caused by ac electric train at the switching frequencies, but can be seen at the OCL system, shall also be considered but can be separately.	Add text: 'Handling the overvoltage caused by ac electric trains harmonics emissions at their switching frequencies is not in the scope and may requires suitable management separately.'	3	DC	7 and 5	G2.1.3 and 1.1.5	(OB) Suggested change has been incorporated. Revised text makes it clear that this aspect is currently not within the scope of this RIS. See comment no. 26.
12	7	G2.2.3	<i>'Appendix A sets out a summary of ac system characteristics related to the contact line frequency'</i> But it is for the fundamental power frequency only.	Amend text: 'Appendix A sets out a summary of ac system characteristics related to the contact line fundamental power frequency.'	3	DC	7	G2.2.3	(OB) Suggested change has been incorporated. See comment no. 27
13	9	Part 3	<i>'Overhead contact line and pantograph interface'</i> Currently, it does not cover electrical characteristics of the OCL system, which is also important for the interface between the OCL system and the ac vehicles.	Add a section 3.4 Electrical characteristics of the OCL system Guidance G3.4.1 The electrical characteristics of the OCL system covering the harmonics frequencies, provisionally for up to 20kHz, shall be evaluated. This is an area still requires development.'	3	DC	10	3.4	(OB) Text has been updated to address the comment and additional guidance has been included for harmonic characteristics of the OCL system. See comment no. 28

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14	12	5.1.1	How big is "the area"?	... structure reference code (unique within a defined area).	3	DC	12	5.1.1	(ED) Suggested change has been incorporated
15	14	5.4.1	Delete comma in second line.	... shall include signs that warn ...	3	DC	14	5.4.1	(TY) Suggested change has been incorporated
16	13	5.3.1	"At power changeover locations with interfaces to 25 kV ac electrified routes, signs shall be provided and positioned in accordance with RIS-3784-TOM." This requirement says just follow another RIS. Why is this necessary?	Delete clause	3	DC	14	G5.3.1	(CE) Text has been updated to be guidance and provide a simple cross reference to RIS-3784-TOM.
17		4.1	4.1.1 Overhead contact line (OCL) dimensions for parameters Y and Z as set out in BS EN 50122-1:2022, Figure 1 shall be 2 m. 4.1.2 For contact lines which include a catenary wire, the dimension for parameter X, set out in BS EN 50122-1:2022, Figure 1 shall be either: a) $X = 4 \text{ m}$; or b) $X = HP \times \tan(30^\circ)$ 4.1.3 For contact lines without a catenary wire, the dimension for parameter X, set out in BS EN 50122-1:2022, Figure 1 shall be 4 m. BS EN 50122-1:2022 - states "If the contact line zone and/or current collector zone is not specified in national regulations, this shall be specified by the relevant entity (e.g. infrastructure manager, contracting entity etc)." This is an infrastructure managers decision. Not required. Please note that NR will follow the GLRT1210 issue 2 dimensions for Y & Z. Dimension 'Y' is 1400 mm either side of the TCL. Dimension 'Z' is equal to 'SH' – 'HP', where the maximum height of the current collector zone 'SH' is 6800 mm and 'HP' is the highest point of the OCL.	Delete clause as this is an infrastructure managers decision	3	DC	11	4.1	(OB) Text has been updated to address the comment. Update for dimensions Y and Z now align with text in GLRT1210 issue 2. The proposed values in the RIS are national values. However, infrastructure managers (in accordance with their licence conditions) have the opportunity to agree and use different values. See comment no. 29 and 31

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18		5.1.1	Every OCL structure shall be provided with an identification plate giving the structure reference code (unique within the area). Please define area?	Every OCL structure shall be provided with an identification plate giving the structure reference code	3	DC	12	5.1.1	(ED) Text has been updated to address the comment (see no. 14 above)
19		G 5.1.5	"Structure identification plates historically consist of letters representing an electrical control room area , a number representing distance in mile or kilometre intervals and a number representing the individual structure within a mile or kilometre interval. "	"Structure identification plates historically consist of letters representing an electrified route , a number representing distance in mile or kilometre intervals and a number representing the individual structure within a mile or kilometre interval. "	3	DC	12	G5.1.5	(ED) Suggested change has been incorporated
20		5.1.2	The size and location of structure identification plates shall be such that the text is readable from the cab of a stationary train. This clause is not helpful. Please specify driver eyesight performance, and the distance between the cab of a stationary train and the sign?	Specify font size.	3	DC	12	G5.1.6	(OB) Text has been updated to address the comment
21		5.2.1	The start of each OCL phase separation section shall be made visible using lineside operational sign AJ02. This requirement is covered in GLRT1210, figure 1 The signage requirements as split between GLRT1210 & RIS 1853. (figure in one document, and requirements in another)	Please consolidate requirement in one document	3	NC	12	5.2.1	(OB)Noted. APC magnets are needed for technical compatibility between the energy and legacy rolling stock subsystems and are therefore within the scope of the RGS. The associated signage aspects were deemed to be out of scope of an RGS and have therefore been included in this RIS.
22		5.2.2	Lineside operational sign AJ01 shall be provided on each line with a signalled approach to sign AJ02, except for lines that cannot be approached by a train that can be powered from the OCL. Don't understand the exception	provide addition guidance	3	DC	12	G5.2.9	(ED) Exception covers unelectrified lines which are on the approach to a neutral section e.g. at a junction. Additional guidance provided
23	13	5.3.1	"At power changeover locations with interfaces to 25 kV ac electrified routes, signs shall be provided and positioned in accordance with RIS-3784-TOM." This requirement says just follow another RIS. Why is this necessary?	Delete clause	3	DC	14	G5.3.1	(CE) Text has been updated to a guidance. See comment no. 16
24	16	Appendix A	Reference 1.8, 1.9, 1.10 & 1.11 are not related to clause 2.1	Delete rows	3	DC	15	Appendix A	(ED) Suggested change has been incorporated

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25	5	1.1.5	<i>'This document also contains an informative annex that summarises the main ac system characteristics for rolling stock compatibility.'</i> But it does not cover the harmonic frequency related information for rolling stock compatibility and the compatibility with signalling and telecoms systems. Please also see comment No. 4.	Add text: 'It does not cover the harmonic frequency related information for rolling stock compatibility and the compatibility with other interfaces such as signalling and telecoms systems.'	3	DC	5	1.1.5	(OB) Suggested change has been incorporated. See comment no. 10
26	7	G2.1.3	<i>'Appendix A sets out a summary of ac system characteristic related to the contact line voltage'.</i> The relevant items are focused on fundamental frequency of the ac traction power supply systems. The harmonics overvoltage caused by ac electric train at the switching frequencies, but can be seen at the OCL system, shall also be considered but can be separately.	Add text: 'Handling the overvoltage caused by ac electric trains harmonics emissions at their switching frequencies is not in the scope and may requires suitable management separately.'	3	DC	7 and 5	G2.1.3 and 1.1.5	(OB) Suggested change has been incorporated. See comment no. 11. The revised text now makes it clear that this aspect is currently not within the scope of this RIS
27	7	G2.2.3	<i>'Appendix A sets out a summary of ac system characteristics related to the contact line frequency'</i> But it is for the fundamental power frequency only.	Amend text: 'Appendix A sets out a summary of ac system characteristics related to the contact line fundamental power frequency.'	3	DC	7	G2.2.3	(OB) Suggested change has been incorporated. See comment no. 12
28	9	Part 3	<i>'Overhead contact line and pantograph interface'</i> Currently, it does not cover electrical characteristics of the OCL system, which is also important for the interface between the OCL system and the ac vehicles.	Add a section '3.4 Electrical characteristics of the OCL system Guidance G3.4.1 The electrical characteristics of the OCL system covering the harmonics frequencies, provisionally for up to 20kHz, shall be evaluated. This is an area still requires development.'	3	DC	10	3.4	(OB) Additional guidance included for harmonic characteristics of the OCL system. See comment no. 13.
29	11	4.1.1	The requirement for the value of 'Z' to be 2m seems to contradict NR/L2/ELP/21085 where the same dimension 'Z' is required to be 0.6m (max). This would seem to mean that bonding/flashover strips are required even when the electrical clearance to an overbridge is >600mm. Also the word 'dimensions' in the sentence perhaps needs to be singular because there is only one dimension (2m) stated at the end of the sentence; unless it was intended to state two different dimensions for 'Y' and 'Z'(?)	Check consistency for the value of 'Z' with regard to NR/L2/ELP/21085, and clarify (in accompanying guidance clauses) the requirement for bonding/flashover strips (between the two values) if indeed the two values for 'Z' should be different in the two standards.	4	DC	11	Part 4	(CE) Text has been updated to address the comment. Updated OCLZ parameters Y and Z now align with text in GLRT1210 issue 2. See comment no. 17 and 31.
30	7	G2.1.2	References clause 3.16 of clause 4.1 of EN50163. Is this an error? There is no clause 3.16 under clause 4.1. Clause 3.16 is separate to clause 4.1.	Make sure the correct clause is referenced.	5	DC	7	G2.1.2	(ED) Text has been updated to clarify that 3.16 refers to BS EN 50163 and not to the RIS.

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31	11	4.1.2	Set out in BS EN 50122-1:2022, Figure 1 shall be either: a) X = 4 m; or b) X = HP × tan(30°)	Open to misinterpretation and slightly conflicts NR/L2/ELP/21085 iss 5. I'm assuming we are supposed to use whichever gives the lower X value i.e. for catenary heights greater than 7m method b will give an X>4m. It might worth adding some text to clarify this (if it's not in BS EN 50122-1:2022 already). Doesn't mention anything about OCS structures acting as a barrier.... From 21085 section 6.1.2.1; "The dimension of OCLZ parameter X shall be determined by one of the following methods: a) X = 5.2 m or the distance to the OCLS structure where this is less; or b) X = HP × tan 30° m. Method b) currently requires a deviation from GLRT1210 Issue 2 Clause 3.2." Or anything about anchoring wires, also from 21085 section 6.1.2.1; "Dimension X shall be increased where necessary such that the OCLZ extends at least 2 m beyond the horizontal position of the contact line of any 25 kV out-of-running or terminating contact lines, as shown in Figure 3."	6	DC	11	Part 4	(CE) Text has been updated to address the comment . Dimension X aligns with 50122-1:2022 whilst dimension Y and Z remain as per GLRT1210 issue 2. See comment no.17, 29.
32	11	G 4.1.5	Document states that "The OCL zone and current collector zone are defined in BS EN 50122-1:2022 clause 4.1 and Figure 1, but the dimensions X, Y and Z are to be determined according to 'National Regulations' for which this standard provides national values." It is unclear that a RIS is legally a "National Regulation", since the application of a RIS is the subject of internal procedures or contract conditions.	Clarify the definition of a National Regulation, and if applicable put the definition of OCL Zone back into GLRT1210.	6	NC	11	Part 4	(OB) Noted. The context for a national regulation is considered to be a set of rules that apply nationally. This can be considered as being applicable to RISs, based on duty-holders licence conditions concerning use of standards. In accordance with the code and manual, OCLZ dimensions are not considered to be in the scope of an RGS.
33	14	5.4	Warning signs at Level Crossings isn't one of the "Interfaces to Rolling Stock Subsystem" of the AC Energy Subsystem.	This requirement should be in a different standard, eg. RIS-0733-CCS Appendix F	6	NC	14	5.4	(OB) Noted. Level crossing signage for electrified routes are considered to be within the scope of this standard as the scope is not limited to this interface only. Placement here is considered appropriate at the moment, but consideration can be given to the use of the CCS RIS in due course.
34	14	5.4.1	If this section is to remain, the requirement that "The safety and protection arrangements provided at a level crossing where OCL is present shall include, signs that warn level crossing users of the presence of overhead live wires and any precautions to avoid danger." implies a requirement to provide signs that warn users of <u>any</u> precautions to avoid danger, not just in relation to the OCL.	Reword to read "...signs that warn level crossing users of the presence of overhead live wires and any precautions to avoid associated danger. See RIS-0733-CCS Appendix F for further details."	6	DC	14	5.4.1	(ED) Text has been updated to address comment. The word "any" has been removed to improve clarity.

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35	20-21	Definitions	No abbreviations included.	Add abbreviations, to be consistent with GMRT2111.	6	DC	22	Abbreviations	(OB) Suggested change has been incorporated
36		G 5.2.8	b) Requirements for calculating the minimum response time (MRT) of lineside operational signs. Signs AJ01 and AJ02 are subject to a baseline response time (BRT) of 4 seconds because they require train drivers to take an action in response to the presented information. This is Different to what has historically been used. To my non-signalling mind, distance between signs AJ01 and AJ02 as per this guidance is ~250m (223.52m) based on 4s BRT. Does it need any other 'driveability assessment' considerations? For past projects we had to use a distance of ~1.6 km in the rear of NS as per the withdrawn Group Standard GK/RT0033 (Lineside Signs). This might mean that Aj01 is at different distances on Different Routes??		6	DC	13	G 5.2.10	(ED) Text has been updated to address the comment and further guidance added. Historically, the spacing associated with AJ01 was intended to support tap changer locomotives (e.g. class 87s) which required a continuous repeated action by a driver to bring the current draw to zero before switching off. A distance of 1.6 km (one mile), was typical in order to allow the tap changer to run down to zero from full power in advance of the neutral section. Such tap changer locomotives are in very limited operation (i.e. heritage railways) and shorter distances can be applied. See comment no. 1 and 37.
37	13	G 5.2.8 and G 5.2.9	Until now, the positioning requirements of neutral section warning signs were available only in withdrawn Group Standard GK/RT0033 Issue 3 titled 'Lineside Signs' (Section 5.11.1 for Approach sign AJ01 stated '<i>The sign shall generally be affixed to an electrification structure at the lineside, approximately 1.6km in rear of the neutral section</i>' and Section 5.11.2 for Site sign AJ02 stated '<i>The sign shall generally be affixed to the first electrification structure at the lineside, located in rear of the neutral section</i>'. The Visibility Requirements were stated as '<i>The sign shall be identifiable at permissible speed</i>' for both signs.	The clauses G 5.2.8 and G 5.2.9 give very generic guidance to cover all cases (for example, 1.6km distance requirement may not be practicable for neutral sections in a near triangular junctions). However, the guidance provided by these clauses is very high level and some worked examples would be helpful for easier application and to achieve intended compliance.	7	DC	13	G 5.2.10	(ED) Suggested change has been incorporated. Further guidance included based on typical spacing of 1.6 km. See comment no. 1 and 36
38	16	2.2	Amend '50,5 Hz' to '50.5 Hz'.	Use '.' decimal separator as per UK practice and to avoid confusion with the thousands separator ',' used elsewhere within Table 1.	7	DC	16	2.2	(TY) Suggested change has been incorporated
39	17	2.3	Amend '49,5 Hz' to '49.5 Hz'.	Use '.' decimal separator as per UK practice and to avoid confusion with the thousands separator ',' used elsewhere within Table 1.	7	DC	16	2.3	(TY) Suggested change has been incorporated