REMIT

PANTograph Harmonisation for Electrification and Rolling stock (PANTHER) - System Interface Committee Subgroup

This remit should be read alongside the SIC Protocol – which sets out arrangements for all SICs and their Subgroups) in more detail

1. Establishment and purpose

1.1 System Interface Committees (SICs) have been established to assist the railway industry to manage all aspects of identified system interfaces within the scope of each SIC in the most effective, safe and cost-efficient way, as set out in the SIC Protocol.

1.2 SICs will identify solutions based on technical and economic evaluation and make recommendations which are in the best interest of the industry to the Technical Leadership Group (TLG), industry, including RSSB, or the Department for Transport as necessary. In so doing, recommendations should take into account the benefits to the industry as a whole, where the specific benefits will fall and the cost of implementing the recommendations.

1.3 SICs may establish subgroups to carry out work in support of their purpose. The remit of each subgroup shall reflect the practice for SICs set out in the SIC Protocol, unless the SIC determines that it is inappropriate to do so for the purpose of a particular group.

1.4 The purpose of the PANTHER SIC Subgroup is to provide the focus for the Research and development within the industry aimed at resolving:

- Interface issues on the mainline railway system in relation to compatibility between pantograph and overhead system with particular focus on current collection, gauge clearance and dynamic performance and provide a forum to support the resolution of cross-industry technical issues. Currently proposed projects are shown in the appendix B.

The SIC Protocol defines the governance, operation and management of SICs and their subgroups.

2. Functions and responsibilities

2.1 The functions and responsibilities of the SIC Subgroup are to develop an understanding of the Overhead Line pantograph system and develop perform tactical and strategic roles for standards change and research, including providing expert technical advice and guidance to support the Technical Leadership Group, other SICs and cross-industry groups to develop and deliver the Key Research and development themes listed in section 1.4 above.

3. Operation and management

3.1 The subgroup is not permitted to create other groups without the approval of the SIC, the authorisation of the RSSB executive and in accordance the SIC Protocol.

3.2 The subgroup will report on its activities to the V/TE SIC following each subgroup meeting.

3.3 The activities of the subgroup will be documented in the V/TE SIC work plan. The work plan will, as a minimum, provide a coherent agenda that links to the Railway Technical Strategy and to other aspects of the RST SIC scope.

3.4 Communication of the outputs of the subgroup will be included in the V/TE SIC’s communications plan. This will be developed to support the dissemination of information to
the railway industry (including the outcome of research, its benefits to industry and its implementation by industry) in co-operation with the other SICs.

3.5 The work plan and communications plan will be reviewed by the V/TE SIC and the RST SIC sub-group frequently, at least at the same time as this remit is reviewed.

3.6 Relationship to any other groups.

The PANTHER Sub-group membership will be extended to include representatives from V/S SIC and V/T SIC. The PANTHER sub-group will present an annual report to V/S SIC and V/T SIC committees in addition to V/TE SIC.

3.7 PANTHER SIC Subgroup members shall collectively provide expertise and strategic knowledge of:

- Gauging
- Design of OCS systems
- Design of pantographs
- Design of train power architecture
- CFD and Finite Element modelling techniques
- Dynamic interaction of pantograph and contact systems
- Modelling the dynamics of mechanical systems
- Industry standards

3.8 The subgroup will cease activity upon completion of its remit as determined by V/TE SIC.

4. Meetings

4.1 The subgroup shall meet approximately every eight weeks unless the Chair considers there is insufficient business to justify a meeting.

4.2 The SIC Protocol sets out the industry categories that shall be represented on the SICs (including subgroups). The role of each member is to represent the views of the constituency to which they belong. The composition of the subgroup is set out in Appendix A.

4.3 The SIC Protocol requires that at least three members (including the Chair) or authorised alternates must be present for the meeting to be quorate, including at least one member representing an industry category. The quorum will be established at the beginning of each meeting.

4.4 For the subgroup, the members who must be present for the meeting to be quorate are:

- The Chair
- 1 x representative from Vehicle / Train Energy System Interface Committee
- 1 x representative from Vehicle / Track System Interface Committee
- 1 x representative from Vehicle-Structures System Interface Committee
- 1 x Network Rail (OCS expertise)
- 1 x Passenger TOC or Freight representative

4.5 If the meeting is not quorate, absent members will have two weeks after issue of the draft minutes of the meeting to make an objection to any decision taken in the meeting. If no such objections are made the decision will stand.
5. Evaluation and review

5.1 V/TE SIC shall undertake an annual self-assessment of its own, and its subgroups’, performance in delivering its activities and provide the results of the assessment to the RSSB executive. If the review concludes that the subgroup no longer has sufficient business to warrant remaining active, the Chair shall recommend that the group is closed and make arrangements, if necessary, for any outstanding business to be transferred to another appropriate committee.

5.2 If the subgroup considers that a change to its remit is needed, it shall make a proposal to the V/TE SIC. New and modified remits shall be subject to endorsement by the V/TE SIC and authorisation by the RSSB executive.

5.3 If the subgroup considers that its membership, skills or experience are no longer appropriate or sufficient to operate effectively, it shall take steps to rectify the situation.

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<th>Date</th>
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<td>26/06/2020</td>
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Appendix A  Subgroup’s coverage, composition and subgroups

A.1 The scope of the PANTHER Subgroup

A.1.1 The scope of the subgroup is to improve the current collection interface by focussed research and proposing standards change and reviewing industry best practice with respect to:

- pantograph gauging
- current collection forces
- spacing of pantographs
- wear and damage of the current collection interface
- Integration of the knowledge learned for proposals for standards change for pantograph compatibility

A.2 Composition of the PANTHER Subgroup

A.2.1 Industry categories that are entitled to have a member on SICs (including subgroups) are set out in the SIC protocol.

A.2.2 For PANTHER subgroup the membership consists of:

- The Chair
- 1 x representative from Vehicle / Train Energy System Interface Committee
- 1 x representative from Vehicle / Track System Interface Committee
- 1 x representative from Vehicle / Structures System Interface Committee
- 1 x Network Rail (with OCS knowledge)
- 1 x passenger train operator TOC
- 1 x Freight operator
- 1 x rolling stock owner
- 1 x RSSB
- 1 x Supplier or their nominated alternates. (vehicle manufacturer)

A.2.3 Observers are invited from:

- Office of Rail and Road
- Department for Transport

A.2.4 The current membership list can be found on RSSB’s website (https://www.rssb.co.uk/groups-and-committees/rssb-board/technical-strategy/technical-leadership-group/system-interface-committees/vehicle-train-energy-system-interface-committee/pantograph-harmonisation-for-electrification-and-rolling-stock-group-panther). The SIC Protocol sets out more details on membership.

A.2.5 Note: To maintain the independence of the Chair, the constituency to which the Chair belongs may appoint another member to the committee so that the views of that constituency are represented.
Appendix B  Proposed Research Ideas

- Lightweight (i.e. carbon fibre) pantograph to improve dynamic response
- Active pantographs to improve dynamic response
- Development of strategies to minimize the use of multiple pantographs operation
- Other Industries (i.e. FT) Blue Sky thinking
- A dynamic multi-element modeling capability of current collection system, available to industry.

Understanding Forces

- Digital footprint for all CLE types
- Undertake hardware in the loop testing
- Improve fatigue understanding
- Single strip carbon
- Optimized spacing of carbon
- Non-conducting pantograph horns
- Aerodynamic study to assist with predicting the pantograph uplift
- Pantograph material types

Understanding Current Interface Wear

- Identify the duty cycle of the pantograph
- Investigation into carbon separation
- Pantograph specification

Cross Industry Working

- Improve understanding of pantograph dynamic gauging
- Pantograph clearance (Mechanical)
- Pantograph clearance (Electrical)
- Assist / gauging data

Improving Standards

- Review performance requirements for pantographs to refine clause 4.9.1 & 4.9.2 of GART123
- Reviewing minimum pantograph spacing to refine clause 4.9.2 of GART123 and clause 3.5 of GART1230
- Guidance on maximum reach of pantograph to inform wire heights at level crossing to refine clause 3.1.5 of GART1230

Cross Industry Working

- Reviewing acceptable wear of contact wire
- Understanding acceptable wear of pantograph
- Investigate OLE gradients
- Rate of change
- What is the limiting factor?
- Earthing pantographs in service vehicles
- Supports vehicle/water recirculation
- Precise tension of pantograph on the move
- Supports discontinuous electrification

Opportunities

- To minimize catastrophic damage to OLE during derailments
- Improve and faster AEC operation
- Static current rating of OLE/Pantograph Interface
- On-board battery recharging
- Showroom current rating of OLE/Pantograph Interface

Requirements

- Industry Business Case
- To minimize catastrophic damage to OLE during derailments

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