OPEN TENDER

RSSB INVITATION TO TENDER FOR THE PROVISION OF: RSSB2711 - T1150 - A feasibility study into the use of High Voltage couplers on rolling stock

Deadline: Tuesday 17th July 2018

ITT Reference: RSSB2711 - T1150 - A feasibility study into the use of High Voltage couplers on rolling stock

# TENDER DOCUMENTS

1.1 Tenders shall be submitted in accordance with the following instructions. It is important that all the information requested is provided in the format and order specified. If the Tenderer does not provide all of the information RSSB has requested within the tender pack, RSSB may reject the tender as non-compliant.

1.2 Tenderers must obtain for themselves, at their own responsibility and expense, all information necessary for the preparation of their tender. Tenderers are solely responsible for any costs and expenses in connection with the preparation and submission of their Tender, and all other stages of the selection and evaluation process. Under no circumstances will RSSB, or its advisors, be liable for any costs or expenses Tenderers, their sub-contractors, suppliers or advisors incur in this process, including if this tendering process is terminated or amended by RSSB.

1.3 Tenderers are solely responsible for obtaining the information that they consider is necessary in order to prepare the content of their tender and to undertake any investigations they consider necessary in order to verify any information RSSB provides during the procurement process.

1.4 All pages of the tender submission must be sequentially numbered (including any forms to be completed and returned).

1.5 All specifications, plans, drawings, samples and patterns and anything else that RSSB issues in connection with this ITT, remains the property of RSSB and are to be used solely for the purpose of tendering.

1.6 At any time prior to the deadline for receipt of questions, RSSB may modify the tender documents by amendments in writing.

1.7 RSSB (at its sole discretion) may extend the deadline for receipt of Tenders.

RSSB reserves the right to modify or to discontinue the whole of, or any part of, this tendering process at any time and accepts no obligation whatsoever to award a contract.

# GENERAL, LEGAL & COMPLIANCE

2.1 RSSB will check each tender for completeness and compliance with the tender instructions. RSSB reserves the right to reject any tenders it considers substantially incomplete, or non-compliant (each tender will be assessed on its own merit, according to the level/importance of omitted or non-compliant content).

2.2The Tenderer will be excluded should any of the grounds for mandatory rejection or discretionary rejection be triggered. Mandatory requirements can be viewed within the Public Contracts Regulations 2015.

2.3 Tenderers are required to confirm in their tender response, they are able to meet all mandatory and discretionary requirements.

2.4 The Tenderer will be excluded should it be assessed that it has a high risk of:

* + Insolvency over the lifetime of the contract; e.g. the Tenderer may be excluded if its current assets to current liabilities ratio is less than 1;
  + Insufficient financial capacity to deliver the services effectively; or
  + Over-dependence on RSSB (e.g. the Tenderer may be excluded if its turnover is less than £ [no more than2x the contract value]

# 3.0 TENDER INSTRUCTIONS

3.1 “RSSB” means the contracting authority, seeking to invite suppliers to participate in the procurement process.

“You” or “Supplier” means the legal entity completing these questions, seeking to be invited to the next step of the procurement process Invitation to Tender (ITT)

3.2 Please ensure all questions are completed in full and in the format requested. Failure to do so may result in your submission being disqualified. If the question does not apply you need to clearly state N/A.

3.3 If it is necessary for you to provide additional information this should be provided as an appendix and clearly referenced as part of your declaration.

3.4 **RSSB REPRESENTATIVE**

Your main point of contact is: [shareditt@rssb.co.uk](mailto:shareditt@rssb.co.uk)

**RSSB OVERVIEW**

If you wish to find out more about RSSB, please visit our website at [www.rssb.co.uk](http://www.rssb.co.uk)

**Timetable**

The timetable for this procurement follows. This is intended as a guide and whilst RSSB does not intend to depart from the timetable, it reserves the right to do so at any stage.

The expected milestones are set out below:

|  |  |
| --- | --- |
|  | **Start Date** |
| I.T.T Issued | 26/06/2018 |
| Supplier clarification questions deadline | 10/07/2018 17:00 hours |
| **Deadline for Submitting Tenders** | **17/07/2018 17:00 hours** |
| Post Tender Clarification & Evaluation | W/C 16 /07/2018 |
| Estimated notification of award decision | W/C 23 /07/2018 |
| Target contract commencement date | W/C 30 /07/2018 |

Note: RSSB reserves the right to amend these dates as business requirements demand and will communicate any changes to tenderers.

3.5 **QUESTIONS**

Should you have any questions relating to the project, please email these before the deadlines detailed in the project timeline above to ensure that these questions can be effectively addressed? To ensure equal and fair treatment to all potential suppliers, RSSB will circulate all questions and responses anonymously.

Questions should be emailed to: [shareditt@rssb.co.uk](mailto:shareditt@rssb.co.uk)

# 4.0 Evaluation Information

4.1 In the interests of an open, fair and transparent assessment, this document sets out how RSSB intends to evaluate tender responses. It outlines the evaluation criteria and respective weightings, as well as the evaluation methodology to be applied.

4.2 **Verification of Information Provided**

Whilst reserving the right to request information at any time throughout the procurement process. RSSB may enable the Supplier to self- certify that there are no mandatory/ discretionary grounds for excluding their organisation. When requesting evidence that the supplier can meet the specified questions relating to Technical and Professional Ability RSSB may only obtain such evidence after the final tender evaluation decision and only from the winning Supplier only.

4.3 **Please self-certify whether you already have, or can commit to obtain, prior to the commencement of the contract, the levels of insurance cover indicated below:**

* Employer’s (Compulsory) Liability Insurance = £2M
* Public Liability Insurance = £1M
* Professional Indemnity Insurance = £1M

4.4 **Sub- contracting Arrangements**

Where the Supplier proposes to use one or more sub- contractors to deliver some or all of the contract requirements, a separate Appendix should be used to provide details of the proposed delivery model that includes members of the supply chain and percentage of work being delivered by each sub -contractor and the key deliverables that each sub- contractor will be responsible for.

RSSB recognises that sub- contracting arrangements may be subject to change and not finalised until a later date. However, Suppliers should be aware that where information provided to RSSB indicates that sub- contractors are to play a significant role in delivering the key requirements and any changes to those sub- contracting arrangements significantly affect the ability of the supplier to deliver key requirements the Supplier should notify RSSB immediately of any changes in the proposed supplier sub-contractor arrangements. RSSB reserves the right to deselect the Supplier prior to any award of contract based on an assessment of the updated information.

4.5 **Consortia Arrangement**

If the Supplier completing this tender submission is doing so as part of a proposed consortium the following information must be provided:

* Names of all consortium members;
* The lead member of the consortium who will be contractually responsible for delivery of the contract (if a separate legal entity is not being created); and
* If the consortium is proposing to form a legal entity, full details of the proposal should be submitted as an Appendix with this Tender.
* RSSB may require the consortium to assume a specific legal form if awarded the contract. If it is deemed that a legal incorporation is necessary for the satisfactory performance of the contract.
* All members of the consortium will be required to provide the information required in all sections of the Tender as part of a single composite response to RSSB i.e. each member of the consortium is required to contribute to completing the response document.

4.6 **Confidentiality**

RSSB reserves the right to contact the named customer contact and the nominated customer does not owe RSSB any duty of care or have any legal liability, except for any deceitful or maliciously false statements of fact.

RSSB confirms that it will keep confidential and will not disclose to any third parties for any information obtained from the named customer contact, other than to the Crown Commercial Services and or contracting authorities defined by the Public Contract Regulations.

# 5.0 Evaluation Process

5.1 The process that will be used to select an appropriate Tenderer and award the contract for this procurement is available in more detail in the Evaluation Criteria.

The open procedure is a single stage process.

5.2 **Marking for Award Criteria**

An evaluation panel consisting of representatives of key stakeholders within RSSB will carry out the evaluation. The procurement team will only act as moderator during the assessment phases of the evaluation.

Each evaluation area is weighted to show the relative importance significance of the criteria specific area’s for assessment.

# 6.0 PROCESS AND PREPARATION OF RESPONSES

6.1 The Supplier shall not enter in any agreement or arrangement with any third party which would in any way cause RSSB or its members to incur any financial obligations to the Supplier or any third party.

6.2 The Supplier shall not approach any Customer employee, the Customer’s Representative or its agents to discuss any aspects of the Tender. All communication should be conducted via the Customers Representative.

6.3 The Supplier shall not canvass support for the award of the contract by approaching any employee of RSSB, its Representative or its agents.

6.4 The documents as enclosed are to be accepted in their entirety. No alteration Representative before the date stated for the receipt of tenders. If any alteration is made or these instructions to Suppliers are not fully complied with the tender may be invalidated.

6.5 The conditions of contract included in this Invitation to tender apply. The Suppliers standard terms of business or trade will not be accepted.

6.6 Any requested changes to the conditions of contract must be detailed on the Contract Issues Memo document included for consideration. If this is not completed, it is assumed that the Supplier has accepted all terms and conditions detailed and no further changes will be accepted.

6.7 The Supplier shall be deemed to have satisfied itself as to the nature, extent and the content of the goods, services or works to be provided, the extent of staff required and all other matters, which may affect the tender.

6.8 All prices quoted to be GBP (unless otherwise requested in the Invitation to Tender) exclusive Value Added Tax and firm.

It is the Suppliers responsibility to ensure the tender is correct at the time of submission. No amendment to the tender will be allowed after the due date.

6.9 Any questions must be emailed to the main point of contact no less than five days before the return date. Note: questions/responses will be circulated anonymously to all Suppliers invited to tender. Tenders received after the closing date and time will not be considered.

6.10 The Customers Representative reserves the right to correct any omissions or inaccuracies in the Invitation to Tender and to clarify and/or amend any of the Customers’ requirements, up to seven days before the return of tenders.

6.11 All information supplied by RSSB must be treated in confidence and not disclosed to third parties except insofar as this is necessary to obtain sureties or tenders required during the preparation of the Tender. All information provided by Suppliers will be treated in confidence except in stances where references may be sought.

6.12 RSSB reserves the right to cancel this Tender at any point and any cost incurred in the preparation of this Tender is at the Bidder’s expense.

6.13 Tenders must remain open for acceptance for a period of 180 calendar days from the submission date.

6.14 The tenderer should include the following information as part of their tender response:

Legal entity name of Tenderer

|  |
| --- |
|  |

Contact person's name, email address, telephone number and postal address for enquiries relating to this procurement

|  |
| --- |
| Name: |
| Postal address: |
| Telephone number: |
| Email address: |

Tenderer’s registered address

|  |
| --- |
|  |

Tenderer’s website address (if available)

|  |
| --- |
|  |

Please tick the box for the legal form of the Tenderer

|  |
| --- |
| * Sole Trader * Partnership * Limited Liability Partnership * Private Limited Company * Public Limited Company * Local Council * Voluntary/ charitable/ not for profit organisation * Other (please specify below) |

If ‘Other’ has been selected from the question above please provide details.

|  |
| --- |
|  |

If your business is a registered company, charity or any other registered organisation (including limited, non-limited or Industrial and Provident Society), please state your registration number. This must be the registration number of the Tenderer, providing the country and date of incorporation / registration if other than the UK.

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|  |

Name of ultimate parent company (if this applies)

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| --- |
|  |

Companies House Registration number of ultimate parent company (if this applies)

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| --- |
|  |

**Additional Notes**

* Fully answer the question given and consider the weighting for the section
* Explain how you will meet the criteria and provide evidence to support your response.
* Further reading on how to complete the tender is available in section 10

# 7.0 TENDER EVALUATION (SELECTION CRITERIA)

|  |  |  |
| --- | --- | --- |
| **Heading** | **Specific question(s)** | **Evaluation Criteria** |
| S1 Project Summary  [Max 1 page] | Please provide a summary of the key points of the approach to the proposal, identifying the key strengths of the submission. | Pass: The tenderer provides a summary of the key points of the approach to this work, inclusive of identifying the key strengths of the submission. Further, said response to this question gives RSSB a high degree of confidence in the tenderer  Fail: The tenderer either fails to provide a summary to the key points of the approach to this work or said response to this question does not give RSSB a high degree of confidence in the tenderer. |
| S2 Experience of the supplier performing feasibility analysis  [Max 1 page] | Please provide a short description of two projects in which you delivered a feasibility study in the last two years?[[1]](#footnote-1) Please include a short explanation on why they are relevant to the requirements of this project. | Pass: The tenderer provides examples and two short description of two projects in which the tenderer has delivered feasibility studies in the last two years. Further the tenderer provides a short explanation as to “How?” and “Why? the examples given by the tenderer are relevant to the requirements of this project. Additionally, through the above, tenderer provides RSSB with a strong degree of confidence in its experience shown in at least two projects that required feasibility analysis.  Fail: The tenderer either fails to provide evidence of at least two examples or fails to provide RSSB with sufficient confidence in its experience feasibility analysis. |
| S3 Experience of the organisation performing cost benefit analysis-like activities  [Max 1 page] | Please provide a short description of two pieces of research that involved calculating economic benefit? Please provide a short explanation on why they are relevant to the requirements of this project. | Pass: The tenderer provides a short description of two pieces of research that involved calculating economic benefit. Further the tenderer provides a short explanation as to “How?” and “Why?” the examples given by the tenderer are relevant to the requirements of this project. Additionally, the tenderer provides RSSB with a strong degree of confidence in its experience shown in at least two projects that required assessing economic benefit.  Fail: The tenderer either fails to provide evidence of at least two examples or fails to provide RSSB with sufficient confidence in its experience in assessing the economic benefit. |

# 8.0 TENDER EVALUATION (AWARD CRITERIA)

8.1 **ITT Assessment**

**The Contract Award decision is solely based on the basis of Tenderer proposal and price offering.**

8.2 RSSB uses the following quality / price ratio to determine the outcome of the evaluation where quality (technical evaluation) and price are weighted and scored individually before being combined.

Quality 80%: Price 20%

8.3 Technical criteria are weighted and scored as a percentage of the maximum score available with a minimum quality threshold set.

**Technical Evaluation**

8.4 Tenders are assessed on how well they satisfy the technical evaluation criteria.

The relative importance of each criterion is established by giving it a percentage weighting so that all the weightings equal 100%. The Evaluation Matrix provides details of the weightings that RSSB will use in assessing Tenderer proposals.

The Technical Evaluation will be carried out using Tenderer responses to the tender specification using the scoring scheme (identified in Table below).

8.5 The scored responses are generally assessed out of a maximum of five (5). The Evaluation Panel will not be allowed to give partial scores (for example 3.5); however, once all scores are aggregated, the technical scores will be rounded to two decimal places prior to consolidating with the price evaluation.

8.6 The following shall constitute a failure to evidence satisfactory delivery of the requirement(s) of the procurement and will automatically disqualify the Tenderer:

1. A grade of zero (0) in any of the evaluated technical/quality questions in Section D of Schedule One (a) of Part B of the ITT before the weightings are applied; or
2. a grade of one (1) in more than one of the evaluated technical/quality questions in Section D of Schedule One (a) of Part B of the ITT before the weightings are applied

8.7 Those Tender Responses which fail to demonstrate satisfactory delivery of the requirement(s) of the procurement by reason of failing to achieve these minimum thresholds will be set aside and not considered further.

|  |  |
| --- | --- |
| **Grade** | **Definition of grade** |
| 5 | A wholly excellent Tender Response that (where applicable):   * Addresses all aspects of the question in an informed and comprehensive manner; * Demonstrates a thorough understanding of what is being asked for; * Provides evidence of how that understanding can be applied in practice; * Offers full confidence that the Tenderer will deliver the service in full; * Addresses the majority of areas of doubt and uncertainty; and * Provides certain, unambiguous commitments or statements of intent that permit reliance through translation into contractual terms |
| 4 | * A good Tender Response that (where applicable): * Addresses all aspects of the question and is generally of a good standard; * Demonstrates a good understanding of what is being asked for; * Provides a worked-up methodical approach; * Offers confidence that the Tenderer will deliver the service in full with limited areas of doubt or uncertainty; * Addresses key areas of doubt and uncertainty; and * Provides commitments that can be translated well into contractual terms |
| 3 | A satisfactory Tender Response that (where applicable):   * Addresses the majority of the question and is generally of a good standard but lacks substance or detail in some areas; * Demonstrates an understanding of what is being asked for; * Provides a satisfactory approach; * Offers a general level of confidence that the Tenderer will deliver the service (but with room for doubt in some areas); * Address some areas of doubt and uncertainty; and * Provides some commitments that can be translated well into contractual terms. |
| 2 | A Tender Response that (where applicable):   * Addresses some of the question but *either* lacks relevant information and detail *or* lacks substance in a manner that would suggest the response is a “model answer”; * Demonstrates some understanding but with a lack of clarity in key areas; * Provides an approach which is not wholly appropriate or viable orlacks evidence; * Shows that the level of confidence that the supplier can deliver does not outweigh the doubt; * Does not address many areas of doubt and uncertainty; and * Does not offer sufficient commitment (with doubt as to the extent to which would translate into contractual terms) |
| 1 | A generally unsatisfactory Tenderer response that (where applicable):   * Does not address the question or has omissions; * Lacks understanding in significant areas: * Provides an approach which has gaps or creates concerns; * Shows that the level of confidence that the supplier can deliver is low; * Creates uncertainty; and * Displays significant lack of commitment (with doubt as to the extent to which would translate into contractual terms) |
| 0 | A wholly unsatisfactory Tenderer response that (where applicable):   * Provides no response or omissions/oversights that prevent scoring; * Refuses to deliver the requirement; and * Creates concerns so significant that the response would be detrimental to the interests of RSSB |

# 9.0 ITT Evaluation Matrix (Award Criteria)

|  |  |  |  |
| --- | --- | --- | --- |
| **Heading** | **Specific question(s)** | **Evaluation Criteria** | **Weight** |
| Question 1 Method Statement -ability to meet deliverables | Tenderers should provide a method statement detailing how it is proposed to fulfil RSSB requirements as described in the specification (‘work package objectives’, ‘scope’, and ‘deliverables’).  In particular they should explain how they would meet the critical success factors for this piece of research. | The tenderer’s response (in no more than five pages):   1. Explains how the tenderer will apply their expertise to meet the specification, including how the study would be conducted; 2. Demonstrates their understanding of the objectives and provides a coherent and systematic approach to meet these objectives. 3. Has identified suitable ways to address the project’s critical success factors; | 25% |
| Question 2  Evidence of the supplier’s technical ability in the fields of running electric trains, operational, safety and economic feasibility  [Max 4 pages] | Does the tenderer have the required expertise to successfully complete this project? | The tenderer’s response shows that it:   1. Has identified relevant projects as experience and individuals to deliver the work and that the overall skill covered is of high quality 2. Provide detail of relevant experience and knowledge of the project team. 3. If expertise is not in-house, it has displayed how it will access the required industry experience and knowledge | 20% |
| Question 3  Project management: resource, quality, time | Tenderers should outline (in no more than ten pages) the processes and resources it proposes to use in order to fulfil RSSB requirements.  Tenderers should:   1. Clearly identify each team member’s role; 2. Provide adequate allocation of appropriate resources against deliverables; 3. Demonstrate how they would work with RSSB and communicate and engage with relevant industry stakeholders to ensure that the quality and content of the deliverables are fit for purpose; 4. Explain how they would meet the critical success factors for this piece of research; | The tenderer’s response shows (in no more than ten pages)  that it:   1. Has identified relevant individuals to deliver the work; 2. Has provided a credible plan for delivering successful outcomes to time, quality and cost; 3. Has identified appropriate ways to engage with RSSB and relevant stakeholders; 4. Has identified suitable ways to address the project’s critical success factors; | 15% |
| Question 4 Risks and Challenges | What risks and challenges do you foresee in this project? What mitigating actions will you take in relations to these risks?  Tenderers should provide, in no more than three pages, the risks and challenges that the tenderer foresees for this project as well as the mitigating actions:   * The tenderer provides a detailed and succinct Risk Register. * The tenderer identifies appropriate risks for this project. * The tenderer identifies appropriate challenges for this project. * The tenderer provides an in-depth statement of what mitigating actions will be taken by the tenderer in relation and with specific regard to each risk. * The tenderer demonstrates how they will overcome the challenges that have been identified for this project. | 1. The tenderer provides a detailed and succinct Risk Register. 2. The tenderer identifies appropriate risks for this project. 3. The tenderer identifies appropriate challenges for this project. 4. The tenderer provides an in-depth statement of what mitigating actions will be taken by the tenderer in relation and with specific regard to each risk. 5. The tenderer demonstrates how they will overcome the challenges that have been identified for this project. | 5% |
| Question 5 Communication | How will you ensure effective communication with both yourself & RSSB? Additionally, how do you propose to communicate with key stakeholders | 1. The tenderer provides a well thought out and appropriate communication plan for communication between the tenderer and RSSB. 2. The tenderer communication plan is effective in it’s ability. 3. The tenderer provides a robust statement for communicating with key stakeholders. | 5% |
| Question 6 Deliverables | The Tenderer must provide detail (in no more than two pages) on the project deliverables and their successful delivery, to include:   1. Clear understanding of and process plan for each deliverable   Process for review of deliverables and drafts | The Tenderer’s response shows (in no more than 2 pages), that it:   1. Has a clear plan for delivery of key deliverables, with process plan, milestones and target due dates. 2. Has identified a robust review process that allows for iterations | 10% |
| Question 7 Cost of project | What is the fixed cost for the whole project and the associated cost break down? How and why this represents value for money? | The tender with the lowest total cost will receive 100% of the available weighted score (20%).  Other tenderer’s tenders will receive a pro-rated relative to the lowest cost according to the following formula:  Score of other tender = lowest tender total cost / other tender total cost x 100%. | 20% |

# 10.0 PRICE EVALUATION

10.1 All prices quoted shall be in sterling (unless otherwise requested in the Tender Documents), exclusive of Value Added Tax and shall be firm.

10.2 A full and comprehensive breakdown of all costs and expenses to provide the goods, services or works requested in this invitation to tender must be provided and all assumptions must be clearly stated.

10.3 Failure to provide adequate detail may cause your tender to be judged non-compliant.

10.4 The construction of the price must be clear and easy to understand. Where appropriate the use of tables to show pricing is preferred. We require the following information:

* + - A breakdown by grade and named individual, indicating the number of days to be worked on each task and the daily rate to be charged.
    - A list of sub-contracts with prices and copies of quotations where available (a similar breakdown by grade, named individuals and rates, as above, is required where the sub-contract is for manpower).
    - Details of any other costs, such as hire charges for equipment.
    - Details of travel and subsistence and all expenses to be incurred. Mileage reclaim will be linked to maximum levels set by HMRC.
    - The above breakdowns should be further broken down into individual work packages.

# 11.0 TENDER EVALUATION CRITERIA AND MINIMUM REQUIREMENTS

11.1 In evaluating tenders, the most economically advantageous tender(s) will be sought. This will be using the evaluation criteria and weightings detailed in **ITT Evaluation Matrix** **Award Criteria**.

11.2 The evaluation criteria detail the minimum requirements. Therefore, any tender which cannot demonstrate that it meets any of the minimum requirements will not be marked and will automatically score zero.

Tenderers are advised to carefully consider the attached specifications, ask clarification questions to ensure these are understood.

# 12.0 CONDITIONS OF CONTRACT

The terms and conditions of the contract are contained with a separate document.

**Qualification of the Contract**

Where Tenderers have any queries or concerns with any specific condition of the terms and conditions of the contract, these should be submitted in writing to **shareditt@rssb.co.uk** as soon as possible, and in any case no later than 10 days prior to the deadline for submission of tenders.  Please ensure the specific condition(s) and proposed amendment(s) are provided.  These will be reviewed by RSSB on a case by case basis, and, if accepted, revised terms and conditions will be issued to all Tenderers.  Failure to accept the terms and conditions of the contract or to qualify the tender in any way, may result in the tender being rejected by RSSB.

## 13.0 RSSB Company Information

***Insert Work Package Title*Introduction**

RSSB was established in April 2003. The Company’s primary objective is to facilitate the railway industry’s work to achieve continuous improvement in the health and safety performance of the railways in Great Britain, and thus to facilitate the reduction of risk to passengers, employees and the affected public. The railway is a complex system with multiple interfaces delivered by many different organisations. At RSSB we bring these different organisations together to make collective decisions. We help the rail industry carry out research, understand risk, set standards and improve performance. We provide a constant point of reference in a changing environment.

We support rail in the areas of safety standards, knowledge and innovation and a wide range of cross- industry schemes requiring our knowledge and independence. Our work involves close collaboration, but as technical experts we also appoint suppliers in the wider market to provide an informed view.

**Key elements of the company’s remit are to:**

* Manage Railway Group Standards on behalf of the industry
* Lead the development of long-term safety strategy for the industry, including the publication of annual Railway Strategic Safety Plans
* Propose change through facilitation of the research and development programme, education and awareness
* Measure, report and inform on health and safety performance, safety intelligence, trends, data and risk
* Support cross-industry groups in national programmes which address major areas of safety concern
* Facilitate the effective representation of the UK rail industry in the development of European legislation and standards that impact on the rail system

RSSB is a not-for-profit company owned by major industry stakeholders. The company is limited by guarantee and is governed by its members, a board and an advisory committee. It is independent of any single railway company and of their commercial interests.

# Background

## RSSB Overview

*RSSB* is a membership organisation in the railway that helps industry by understanding risk, guiding standards and managing research. The rail industry in Britain is made up of many different organisations, but they all form a system and share a common purpose, to move people and freight safely and efficiently by rail. *RSSB* brings all parts of this system together to make collective decisions, products and services, to help industry drive out unnecessary cost, improve business performance and develop long-term strategies.

*RSSB’s* activities include:

* **Understanding risk –** Using safety intelligence from across the rail industry and elsewhere with the latest risk modelling to inform members and support safe decision making.
* **Guiding standards** – Creating, reviewing and simplifying GB standards to align with European requirements; managing the *Rule Book* and making it easier for the railway to deliver efficiently and safely.
* **Managing research, development and innovation** – Undertaking, commissioning and managing research and innovation programmes to address current needs, provide knowledge for decision making now and for the future, and promoting step changes to deliver the *Rail Technical Strategy*.
* **Collaborating to improve** – As an independent cross-industry body with a critical mass of technical expertise, supporting activities which require collaboration. These range from supplier assurance schemes (*RISQS, RISAS*) to confidential reporting (*CIRAS*), from health and wellbeing strategies to sustainability principles.

Specification for research project

A feasibility study into the use of High Voltage couplers on rolling stock

T1150

# Background

Optimising the performance and reliability of existing and new electrification/pantograph systems remains a key focus for the rail industry. In recent years to increase capacity the use of electric multiple units formed of up to 3 units (for example a 12-car train formation) has become more widespread[[2]](#footnote-2). At the same time opportunities have been taken to increase the speeds of services to fully utilise the capabilities of modern rolling stock, reduce journey times and essentially keep up with high speed services. It is understood that several Overhead Line Equipment (OLE) systems in GB were designed for single pantograph compatibility but have been progressively shown to be compatible with two and three pantograph operations with some constraints.

The use of multiple pantographs is potentially sub optimal and perhaps limits the train maximum speed due to multiple pantograph/contact wire performance. One of the potential methods of avoiding the need to use two or three pantographs per train is to use high voltage (HV) couplers distributing energy between the multiple units. Whilst this does not reduce the cost of directly introducing electrification, as is discussed below, there are other benefits that this could bring to the network.

There has been some preliminary experimentation in controlled climatic conditions, where the capabilities of a HV coupler design for railway use has been proven, with the findings patented.[[3]](#footnote-3)[[4]](#footnote-4) High voltage couplers are also used in other industries such as mining and there are a number of proprietary designs available but probably intended for different applications. The case for using HV couplers has so far not been fully investigated and this project through a thorough desk-based feasibility study will provide a report on the potential application and use of the technology.

At the November 2017 Pantograph to OLE working group meeting it was recognised that the DfT aspire to operate multiple units, with up to three pantographs raised. However, on some routes with legacy OLE infrastructure the potential maximum speed is limited which means the potential path might not be available or the train has to run with only two units.

This is due to the disturbance from each pantograph on the contact wire and resulting in each following pantograph needing to track a moving wire. At higher speeds, and shorter pantograph spacing, there is less time for the contact wire to stabilise between pantographs.

This study is split into three separate chains of feasibility analysis:

Operation and performance

Safety

Economic

Most importantly, this study will analyse the operational feasibility of using a HV coupler.[[5]](#footnote-5) Considerations for the operation of the HV coupler will need to consider the reliability of the technology to withstand frequent connection and disconnection in line with carriage(s) usage across timetables. The study will need to consider differences in rolling stock design for physical placement of the cables running from above to below the train itself.

This project will assess the safety implications of using a HV coupler, with considerations of the impact upon the responsibilities of maintenance staff, train staff and any issues for train passengers or members of the public. There is a potential increase to the voltage levels of the cables running underneath the train carriages, requiring a consideration for the safety of said individuals. Whilst speculative, if the coupler itself were to malfunction it could pose a safety risk. The research may identify a need to change safety standards and/or guidelines for rolling stock.

The economic reality of the HV coupler is closely linked to our understanding of the performance implications. It is worth noting that the goal of this project is to assess the hypothesis that you can operate only one pantograph for multiple units, leaving the others lowered and potentially enabling the train to run at higher speeds on some sections of routes.[[6]](#footnote-6)

The economic feasibility tests are based on the [potential] reduced wear to pantographs if (on a 12-car train) there is only one pantograph in use as opposed to the status quo of two or three. The knock-on economic savings of potentially fewer dewirements would also provide economic value through repair costs to both sides of the Pan/OLE interface and the delay minutes caused. What will require greater exploration is the economic impact of the increase in running speed, say, from 100 to 110mph. In the final report, the increase in capacity should be mapped as an industry total and a few exemplar operators that are set to benefit more from the efficiency improvements.

This project is not seen as time critical, however it is well-timed to align with industry direction. Along with the continued renewal of the rail network there are large rail projects underway (Crossrail/HS2/Eurostar extension) and more projects being discussed (HS2 second leg/Northern Powerhouse rail etc.). The potential benefits could potentially provide major cost savings and operational improvements to these projects.

# Work package objectives

The project will be split into two work packages, with WP1 being the project scoping conducted by RSSB and WP2 the research tendered through this specification. WP2 research will be required to answer the following questions:

1. Assessment of the potential for existing technologies to deliver in a rail context and identifying **operation** and roll out scenarios
2. Assessment of the potential for **performance** improvements from the introduction of HV coupler under different operation and rollout scenarios
3. Review of the likely **costs** of implementing a HV coupler approach under different operation and rollout scenarios
4. What are the **safety** considerations in introducing a HV coupler
5. What **standards and guidelines** would need developing to support HV couplers
6. What are the **recommendation** for next steps, supported by an **economic** and **commercial assessment**

The development of answers related to these questions is expected to consider the following elements:

Operation and Performance

* What is the impact on the performance of the trains? Including impact on:
  + Speed
  + Train pathing
  + Reliability
  + Energy efficiency
  + Noise/Sound/Equipment wear?
* If reliability is improved will there be fewer delay minutes?
  + What is the benefit of this
  + Again, are some lines set to realise greater economic benefits from this technology?
* Assuming the HV coupler technology can be used in rail, how widespread would the benefits be realised, how many operators would use it?[[7]](#footnote-7)
  + Are some lines/fleets more likely than others
  + Relevance of technology as new rolling stock is introduced
    - Do newer models of rolling stock increase the importance of the technology?
  + Are there examples of HV couplers being used on other railways?
  + Are there any potential challenges that will need to be overcome? Considerations may include:
    - Control and interlocking between VCBs of different units, ensuring VCBs of other units are open when operating on one pantograph
    - Coasting distances when running through neutral sections
    - Traction current paths being non-coincident with in service pantograph car when running through AC isolating sections
  + Are there thresholds where one method or the other would be optimal? E.g. train length

Safety

* What is the impact on the safety of members of the public, passengers and workers?
  + Will new cabling and electrical protection need to be introduced underneath the carriages
  + What is the impact of higher voltage passing through existing rolling stock. Would there be any difference from trains operating today?
  + Are there issues with different weather conditions?

Standards and Guidelines

* What are the implications for standards and guidelines?

Economic and Commercial

* What are the costs and availability of existing systems
* What is the cost of fitting and using the technology?
  + How does this change for retro-fit cases and new rolling stock?
* What is the net economic impact of running trains faster?
* How will the case change as longer fixed formations are considered?
* Where in the industry are costs accrued and benefits realised? and what are the implications for motivating implementation?

# Scope

|  |  |
| --- | --- |
| **In scope** | **Out of scope** |
| * Desk based research producing a research report * Assessment of currently available equipment * Analysing the operational implications of operating less and/or one pantograph on high-speed routes. * Consideration of the reliability, route to market and costs of the technology * Analysing the safety implications of operating fewer and/or one pantograph on high-speed routes * Analysing the safety implications of HV couplers on members of the public, train staff, maintenance staff and passengers * Consideration of the implication for guidelines * Consideration of the implication for rulebook[[8]](#footnote-8) * Consideration of industry readiness for the adopting the technology * Producing an economic model based on the assumptions of operating less or one pantograph on high-speed routes in comparison with status quo * Communication between the supplier and the project sponsor/steering group for ongoing approval and steer | * Development or design of any component: coupler, pantograph etc * Any physical experimentation of HV coupler technology * Any wiring or physical experimentation of train operation * Researching any component/track part that is not used on the GB rail network * Other than the HV coupler itself, the consideration of any other technologies that are not currently being used in industry * Considering different designs for new rolling stock |

# Methodology

The structure of the phases is open to the supplier to define. It is emphasised at this point that the work is a desk-based study and should clearly define how the research will help produce the final report.

Suppliers are expected to explain the methodology that they are intending to use to successfully cover the scope (section 3), meet the RSSB objectives for this work (section 2) and complete the deliverables (section 5).

The supplier is expected to define the data that would be required to carry out this desk-based exercise. The supplier is expected to define any support required from RSSB, the steering group or the project sponsor in the sourcing and collection of this data.[[9]](#footnote-9)

# Deliverables

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  | | --- | --- | | **Final Report: A feasibility study into HV inter-coupler technology** | **Final report** | | The final report will be a detailed report setting out the findings from the feasibility study as defined in WP2. This is due to be delivered by March 2019. The final report will be published on SPARK by the end of June 2019.  The report should explain the research and findings across the categories outlined in section 2. This should also include analysis and continually relate back the findings to its impact on the rail industry. If it is applicable, then there should be recommendations made for changes to relevant standards and guidance.  The final report will be reviewed and accepted by the steering group at the close of the project. It is to be written to allow industry to better understand the impact of utilising the technology. We expect the final report to generate an important conversation amongst those in the industry which will be set to (potentially) benefit from any positive findings. | | | This report will be delivered in RSSB format and made available on SPARK. | |  |  |  | | --- | --- | | **Research brief** | **Summary document** | | A concise document that outlines the findings of the research. This document will cover the objectives of the work and summarise the research. | | | This report will be delivered in RSSB format and made available on SPARK. | |  |  |  | | --- | --- | | **Research presentation** | **Summary presentation** | | A presentation that explains the nature of the project and sets out the key findings. The presentation should include an infographic to communicate the findings and it will need to be delivered to the relevant industry groups. | | | This report will be delivered in RSSB format and made available on SPARK. | | |

# Stakeholders roles and responsibilities

|  |  |  |
| --- | --- | --- |
|  | **General role in project** | **Specific role in acceptance of deliverables** |
| RSSB project manager | The project manager is responsible for the detailed project management including project schedules, cost reporting and other relevant project management tasks.  The project manager leads the project in organising meetings, etc and ensures timely and effective delivery towards project objectives. | Facilitates technical review and acceptance processes, identifies and monitors corrective actions where needed, including facilitating decision making. |
| Technical expert | Throughout the project, the technical expert ensures that technical aspects are reflected accurately.  Technical aspects can refer to specific issues around railway signalling, track engineering, safety relevant operations or any other specialist field. | Reviews emerging outputs from technical perspective. |
| Industry and RSSB sponsor | The Industry and RSSB sponsors act as a figurehead for the research, championing its importance and its outputs.  Their key role is to provide steer to the research as it progresses and exert pressure on the industry to make use of its findings. | Formally accepts deliverables. |
| Project supporters | The project supporters represent parts of industry complementary to the champion’s organisation. They offer expertise for effective project delivery and support the implementation of findings led by the champion through networking, advice and other support. | Formally accepts deliverables. |
| Project steering group | The project steering group ensures the project delivers to industry needs.  As such, it helps formulate specifications, assesses tenders, reviews draft and final outputs and other relevant tasks. | Formally accepts deliverables |

# Budget, timescales and dependencies

The budget for this work is up to £80,000. Any bid above this value should provide detail on why the supplier doesn’t feel that the budget is adequate, and, in such case, we strongly encourage suppliers to provide costed options for RSSB to consider.

The completion date is March 2019. At the time of preparing there is no identified insertion point for the findings. However, with ongoing electrification of the network and major projects being developed -there is a benefit to getting the information in the public domain as soon as possible. This project does not have any dependencies on the completion of other projects or research.

March 2019 represents the date by which the supplier should complete their works, with the RSSB planning to publish the final deliverables on SPARK by the end of June 2019.

# Critical success factors and risk management

# The supplier should ensure that relevant risks are identified and managed within their proposed method. Some high-level risks to consider include:

# Industry interest in the research is not fully committed due to the relatively untested nature of the technology being assessed

# This risk requires the supplier to seek and engage industry sentiment

# It will be stressed that this project is pre-emptive in nature. The technology being proven is taken as given for the sake of a feasibility study.

# Insufficient data available to make a sound judgement on the operational impact of HV coupler technology

**Appendix X Form of Tender**

This section outlines how the offer from the Tenderer is to be constructed. Please return this Tender Declaration along with your Tender and retain a copy for your records.

Having examined the ITT email, the Instructions to Tenderers, the Information Required From Tenderers, the Conditions of Contract, the Specification and this Form of Tender (the “Tender Documents”), we offer to supply all/part of (delete as applicable) the goods, services or works specified in these Tender Documents.

We undertake if selected, to perform the contract in accordance with the Tender Documents, including the Conditions of Contract contained herein.

We agree that this tender shall remain open for acceptance by the Customer for 180 days from the date stipulated for the return of tenders.

We understand that you are not bound to accept the lowest, or any tender you may receive.

We certify that this is a bona fide tender, and that we have not fixed or adjusted the amount of the tender by or under or in accordance with any agreement or arrangement with any other person. We also certify that we have not done and we undertake that we will not do, at any time before the hour and date specified for the return of this tender, any of the following acts:

1. Communicate to a person, other than the person calling for the tenders, the amount or approximate amount of the proposed tender. Except where the disclosure, in confidence, of the approximate amount of the tender was necessary to obtain insurance premium quotations required for the preparation of the tender.
2. Enter into an agreement or arrangement with any other person that he shall refrain from tendering or as to the amount of any tender to be submitted.
3. Offer or pay or give or agree to pay or give, any sum of money or valuable consideration directly or indirectly to any person, for doing or having done or causing or having caused to be done, in relation to any other tender or proposed tender for the said goods, services or works, any act or thing of the sort described herein.

We recognise that the Customer reserves the right to clarify details of our offer prior to the award of any contract.

We hereby undertake that the period during which this tender remains open for acceptance not to divulge to any persons, other than the persons to whom the tender is to be submitted, any information relating to the submission of this tender or the details contained therein except where such is necessary for the purpose of submission of this tender.

**Appendix X Subcontractors**

All suppliers to RSSB are asked to provide details of all sub-contractors that will be used to perform the contract.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name & Address of Sub-Contractor | | Service performed for Contractor | Provide details of staff numbers[[10]](#footnote-10) | Provide latest year’s turnover |
| Name: |  |  |  |  |
| Address: |  |
| Name: |  |  |  |  |
| Address: |  |
| Name: |  |  |  |  |
| Address: |  |

**Appendix X Conflicts** **of** **Interest**

**Tenderers have a continuing duty to disclose actual or potential conflicts of interest in respect of itself, its named sub-contractors and / or consortia members.**

**Please describe any (potential) conflicts of interest that the Tenderer has identified and how these will be managed\*:**

If you **DO** **NOT** have any conflicts to declare, please tick this box:

Tenderers are reminded that failure to identify material conflicts of interest may lead to rejection of its tender response.

Guidance to Tenderers:

Tenderers should describe in the detail the perceived conflict (how it could be perceived in the context of this procurement) and the measures it will take to mitigate the conflict through the procurement life-cycle and service delivery

1. . [↑](#footnote-ref-1)
2. <https://w3.siemens.com/topics/global/en/goingunderground/Documents/PDF/Siemens-Rail-Systems-UK-Supplement.pdf> London Midland 110 by Siemens highlighted both the strategic benefit and technical problems with running trains at 110mph. [↑](#footnote-ref-2)
3. <https://www.sparkrail.org/Lists/Records/DispForm.aspx?ID=24710> [↑](#footnote-ref-3)
4. <https://www.ipo.gov.uk/p-ipsum/Case/ApplicationNumber/GB1216913.2> [↑](#footnote-ref-4)
5. In comparison to the base case of current operational performance using multiple pantographs at high speed [↑](#footnote-ref-5)
6. See Siemens LM 110 project in first footer [↑](#footnote-ref-6)
7. The project works on the premise the technology is functional [↑](#footnote-ref-7)
8. When considering the feasibility, it is worth considering the impact it could have on future guidelines and rulebooks. [↑](#footnote-ref-8)
9. RSSB does not commit to sourcing the data [↑](#footnote-ref-9)
10. This is the average annual numbers of both staff and managerial staff employed over the last trading year [↑](#footnote-ref-10)