OPEN TENDER

RSSB INVITATION TO TENDER FOR THE PROVISION OF: T1114 - Choosing metric or imperial units for driver display on ETCS L1 & L2 overlay areas

Deadline: Friday 23rd March 2018

ITT Reference: T1114 - Choosing metric or imperial units for driver display on ETCS L1 & L2 overlay areas

# 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

**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** |
| Invitation to Tender issued | 27 February 2018 |
| Supplier clarification questions deadline  | 9 March 2018; 12:00 hours |
| **Deadline for Submitting Tenders** | **23 March 2018; 12:00 hours** |
| Post Tender Clarification  | W/C 26 March 2018 |
| Estimated notification of award decision | W/C 2 April 2018 |
| Target contract commencement date | W/C 16 April 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

# 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.

|  |
| --- |
|  |

Name of ultimate parent company (if this applies)

|  |
| --- |
|  |

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

|  |
| --- |
|  |

**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 Experience of the supplier in risk analysis in the GB mainline railway  | Provide a brief description of two projects in which you delivered risk analysis activities to GB mainline railway clients over the last two years? Please provide a brief explanation on why they are relevant to our needs. | **Pass**/**Fail****Pass** = The tenderer has provided a brief description of two projects in which the tenderer has delivered risk analysis activities to GB mainline railway clients over the last two years. Further, the tenderer has provided a brief explanation as to “Why?” the two given projects are relevant to RSSB’s needs.**Fail** =The tenderer has not provided a brief description of at least two projects in which the tenderer has delivered risk analysis activities to GB mainline railway clients over the last two years and/or the tenderer has not provided a brief explanation as to “Why?” the two given projects are relevant to RSSB’s needs.**Note:** Any tenderer that achieves a “Fail” mark will not have their tender submission evaluated any further. |
| S2 Experience of the supplier in performance analysis in the GB mainline railway | Provide a brief description of a project in which you delivered performance analysis activities to GB mainline railway clients over the last two years? Please provide a brief explanation on why they are relevant to our needs. | **Pass**/**Fail****Pass** = The tenderer has provided a brief description of at least one project in which the tenderer delivered performance analysis activities to GB mainline railway clients over the last two years. Further, the tenderer has provided a brief explanation as to “Why?” the given project is relevant to RSSB’s needs.**Fail** = The tenderer has not provided a brief description of at least one project in which the tenderer delivered performance analysis activities to GB mainline railway clients over the last two years and/or the tenderer has not provided a brief explanation as to “Why?” the given project is relevant to RSSB’s needs.**Note:** Any tenderer that achieves a “Fail” mark will not have their tender submission evaluated any further. |
| S3 Experience of the organisation with ERTMS  | Provide a brief description of two ERTMS related projects you have delivered to clients over the last two years? Please provide a brief explanation on why they are relevant to our needs. | **Pass**/**Fail****Pass** = The tenderer has provided a brief description of at least two ERTMS related projects the tenderer has delivered to clients in the past two years. Further, the tenderer has provided a brief explanation as to “Why?” the given project is relevant to RSSB’s needs.**Fail** = The tenderer has not provided a brief description of at least two ERTMS related projects the tenderer has delivered to clients in the past two years and/or the tenderer has not provided a brief explanation as to “Why?” the given project is relevant to RSSB’s needs.**Note:** Any tenderer that achieves a “Fail” mark will not have their tender submission evaluated any further. |

# 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 75%: Price 25%

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**  |
| A1 Robust methodology and previous experience involving ETCS HAZID risk and performance assessment | What is your proposed risk and performance analysis methodology? What previous experience do you have using ETCS HAZID risk and performance assessment in the GB mainline Railway?  | The Tenderer’s response shows that it:* Has understood the requirements
* Has proposed a credible and sound methodology and has proven capability to deliver that methodology
* Explains how they would apply their expertise to meet the specification, including how they would conduct the study;
* Demonstrates their understanding of the objectives and provide a coherent and systematic approach to meet these objectives.
* Has identified suitable ways to address the project’s critical success factors;
 | 35% |
| A2 Project Resources | Who will be part of the delivery team? It is not necessary to produce bespoke CVs, but it is necessary to clearly identify every team member’s role, their relevant experience and contribution to delivery. Provide adequate allocation of appropriate resources against deliverables and have named individuals against specific roles with named alternates identified. How will you work with RSSB to ensure the quality and the content of the deliverables is fit for purpose? | The Tenderer’s response shows that it:* Has identified relevant individuals to deliver the work and that the overall mix of skills covered is of high quality
* Individuals identified to deliver the work required are highly skilled and qualified
* Has provided a credible plan for delivering successful outcomes to time, quality and cost
 | 20% |
| A.3 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.
 | * 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.
 | 5% |
| A4. Communication | How will you ensure effective communication with both yourself & RSSB? Additionally, how do you propose to communicate with key stakeholders | * The tender has identified key stakeholders for the project.
* The tenderer provides a well thought out and appropriate communication plan for communication between the tenderer and RSSB.
* The tenderer communication plan is effective in it’s ability.
* The tenderer provides a robust statement for communicating with key stakeholders.
 | 5% |
| A5. 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:* Has a clear plan for delivery of key deliverables, with process plan, milestones and target due dates.
* Has identified a robust review process that allows for iterations
 | 10% |
| A6 Cost of project | Provide a fix cost for the project and the associated cost break down. Describe how and why this represents value for money. | * The tender with the lowest total cost will receive 100% of the available weighted score.

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%.
 | 25% |

# 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**

Specification for research project

Choosing metric or imperial units for driver display on ETCS L1 & L2 overlay areas

T1114

# Background

The European Train Control System (ETCS) is an in-cab signalling, control and train protection system. It is one of the main components of the European Railway Traffic Management System (ERTMS). The units of measurement used throughout the system design of the European Train Control System (ETCS) are metric, whereas in Britain the practice has been to use imperial units for speed and distance. Recognising this, a Specific Case was agreed to the Command Control & Signalling (CCS) Technical Specification for Interoperability (TSI) that makes it permissible “for the ETCS Driver Machine Interface (DMI) to display dynamic train speed information in miles per hour (and indicate ‘mph’) when operating on parts of the GB mainline network”. This specific case covers the display of dynamic speed information only – it does not cover the entry of speed related train data in miles per hour, nor does it cover the display or entry of distance/length information.

Digital Railway (DR) have defined a number of “migration states” that support the implementation of ETCS level 2 and Level 3 as well as other technologies, and which could be deployed by the Routes to address their particular needs[[1]](#footnote-1). Although referred to as migration states it is not expected that Routes will deploy them following a linear migration process – instead Routes are expected to determine which of the different migration states deliver the greatest benefit to the route and the affected Train Operators. Three of these migration states include the implementation of ETCS Level 2 with lineside signals as either an overlay, underlay or high capacity overlay (migration states M6, M7 and M8 respectively). However, recognising the duration of driver training and the need for drivers to retain ETCS competency during the period prior to signals being removed, coupled with the need for driver handling as part of driver competence building, DR is recommending that that each area utilise an overlay area prior to the roll-out of ETCS without signals.

In areas with ETCS Level 2 with lineside signals, ETCS unfitted trains will operate under conventional signalling and Automatic Train Protection (ATP) systems. ETCS fitted trains will operate in either ETCS Level 2 or in Level National Train Control (Level NTC) under conventional signalling and ATP systems, depending on the availability of the ETCS system, and the ETCS competency of the driver. It is expected that ETCS unfitted trains and trains operating in Level NTC will operate using imperial speed information.

The ETCS reference design has concluded that the most appropriate solution for ETCS fitted trains regarding the display of speed information is:

* When in ETCS Level 1, 2 or 3 the unit of speed displayed to the driver is km/h. This applies whether the train is operating with or without lineside signals
* When in ETCS Level NTC with AWS/TPWS the active system the unit of speed displayed to the driver is mph.

The simplicity of this arrangement is that from a driver perspective, the ETCS DMI is always consistent when under ETCS Level 1,2 or 3. However it results in there being different speed units in use in a Level 2 with signals area dependant on the ETCS level operated by a particular train. RSSB Research project report T1013 Analysing the risk of having a mix of imperial and metric measures on the railway[[2]](#footnote-2), although not specifically aimed at considering all the implications, does suggest that it might be more appropriate to keep the same unit of speed measurement in overlay areas i.e. all trains operate in mph, but this then means that drivers traversing between Level 2 with signals and level 2 only areas will have both metric and imperial measurements displayed in Level 2 operation. It should be noted that Thameslink (and a proposal from Crossrail) will operate in imperial whilst on overlay sections regardless of ETCS operating level. Both projects are looking at their end state as being ETCS Overlay and therefore the migration to ETCS without signals has not been considered at this time.

The migration from a conventional railway using imperial measurement units to an ETCS railway using metric measurement units is a technical and business change challenge. A migration to ETCS is likely always to involve areas of overlay to facilitate driver confidence building and the retention of driver competence during the driver training period. Fundamentally two options exist for the unit of speed measurement to be displayed to drivers on overlay areas:

1. Metric – keeps consistency of measurement aligned with ETCS Level 1, Level 2 or Level 3 (the final target state), but requires mixed operation mph/km/h on overlay areas
2. Imperial – keeps consistency of measurement with conventional signalling (the initial state), but requires mixed measurement within ETCS Level 1, Level 2, or Level 3 when operating between overlay and non-overlay areas.

It is recognised that both approaches have their benefits/dis-benefits and it is considered that further analysis within a framework that is aligned with Common Safety Methods needs to be carried out to facilitate a decision on the most appropriate strategy.

The aim of this project is to assess and analyse the impacts on risk and performance of the two approaches and make recommendations that Routes can follow when implementing ETCS. The risk[[3]](#footnote-3) analysis will be carried out using the HAZIDS framework. The performance analysis will be limited to assessing the impact of not exploiting the limits of the infrastructure for Level 2 operations if mph operation is enforced assuming that:

* it would not be acceptable to drivers or their representatives to display higher[[4]](#footnote-4) mph permissible speeds in cab for Level 2 operation than are signed in mph at the lineside for Level NTC operation e.g. it is not acceptable to indicate 80mph at the lineside but have ETCS displaying 100mph.
* It would be acceptable to display a km/h permissible speed in cab for Level 2 operation that is higher than the equivalent signed mph value for use in Level NTC e.g. it is acceptable, where the infrastructure can support the higher train speed, to indicate 80mph at the lineside but have ETCS displaying 160km/h (100mph).

The justification for this assumption is that permissible speed is a critical part of managing the risk of signal overrun, and where drivers can operate in either Level 2 or Level NTC there is considered to be a higher risk of carrying over a Level2 permissible speed to Level NTC operation if the permissible speeds are both in mph.

It should be noted that it would not be practical to make a direct comparison between the analysis of the risks and performance and both workstreams will be kept separate. As such two basic possibilities exist for the outcome for the project:

1. The analysis shows that one of the options of units can be identified on balance, to be both the safer option and better for performance.
2. The analysis shows that selection of either options leads to a conflict of interest with regards to safety and performance (for example, one option being safer but has a negative impact on performance).

In the event of the first possibility, the recommendations are trivial. With regards to the second, the recommendations will be in compliance with the Common Safety Method on Risk Evaluation and Assessment (CSM REA).

# Objectives

The objectives of this project are to answer the following questions

* What are the implications on safety of DMI speed display units for operations in L2 in an overlay area. This must consider:
	+ Unfitted trains, fitted trains driven by ETCS authorised drivers in Level 2 and non-ETCS authorised drivers operating in Level NTC
	+ Migration from overlay to ETCS L2 without signals areas
	+ Movements across boundaries between overlay and ETCS level 2 without signals areas.
* Identification of hazards and semi-quantified risk analysis for each DMI presentation.
* Which scenarios have the highest risk levels for each DMI presentation
* What is the impact on potential performance of not exploiting the limits of the infrastructure in Level 2 operation because of the need to operate in mph.

Ultimately, this project aims to make recommendations that Routes can apply when installing ETCS equipment, as to what presentation is safest and most feasible for their routes. This project will require the following to be carried out:

#### Technical review of previous safety research (Required for deliverable 1)

A technical review of the previous research conducted in this area (including previous RSSB research). The aim of this work package is to consolidate the information currently available into one report, consider the major gaps in research and use the information available to start building a risk analysis on DMI presentation in overlay areas during Level 1 and Level 2.

* Consider RSSB research projects T1013 and T1091

#### Workshop based risk analysis (Required for deliverables 2, 3A, 3B, 5 and6)

Encompass a workshop-based risk analysis of the two DMI options, considering the scenarios in the objectives, above, This workshop will:

* Identify the risks associated with the two stated options on an operational railway in GB;
* Carry out semi-quantitative analysis consistent with Network Rail’s risk matrix to assess those hazards before and after mitigation is applied;
* Identify measures to mitigate these hazards;
* Determine both with and without identified mitigations, whether risk from the identified risks are likely to be controlled to an acceptable level;
* Deliver the above in compliance with the requirements of legislation including CSM REA;
* Make recommendations to the industry based on risk assessment.

This risk analysis will be done using a HAZID framework, in compliance with Rail Industry Guidance Note GEGN8646 [[5]](#footnote-5)and consider the following:

* An ETCS fitted train will run in and out of overlay areas, encountering both ETCS fitted overlay areas (where the train could utilise either ETCS signalling or conventional signalling (where the train will be controlled with underlying national train control systems (class B) i.e. imperial units).
* ETCS fitted trains will require speed information to be inputted in km/h regardless of what the DMI is presenting
* In certain operational situations, there will be a need for Railway Staff to verbally communicate speed restrictions, for example a signaller advising the driver of an Emergency Speed Restriction (ESR) prior to the necessary trackside equipment being in place or maintenance staff advising of speed restrictions due to Defective on Train Equipment.

#### Performance analysis (Required for deliverables 4, 5, and 6)

The performance analysis will:

* Identify and quantify the impact on potential performance improvements of not exploiting the available limits of the infrastructure for Level 2 operation because of the need to operate in mph.
* Assume that it would not be acceptable to drivers or their representatives to display higher mph permissible speeds in cab for Level 2 operation than are signed in mph at the lineside for Level NTC operation. Exploiting the available limits of the infrastructure could be enabled by (not an exhaustive list):
	+ Increasing permissible speed restrictions imposed because of lineside signal spacing or sighting constraints for trains operating in Level 2.
	+ Shortening permissible speed restrictions that have been extended because of sighting limitations, for example in tunnels.

This inability to exploit the opportunity to increase permissible speed restrictions for Level 2 operation could result in a degradation in performance over Level NTC operation due to the inability to compensate for more restrictive driving practices as a result of ETCS supervision being potentially more restrictive than ‘conventional’ driving.

* Make recommendations to the industry based on the performance analysis.

#### Consolidation of analyses (Required for deliverables 5 and 6)

A consolidation of the results of the safety and performance analyses providing recommendations to industry on which option provide the best balance of safety and performance in compliance with the Common Safety Method on Risk Evaluation and Assessment (CSM REA).

# Scope

## In scope

Note – “S” and “P” in the points below indicate whether the scope item is considered to be in scope of the safety and/or performance analysis.

1. Display of speed information on an ETCS fitted train. (S, P)
2. Operations by authorised (Level 2 “capable”) and non-authorised drivers of ETCS fitted trains in overlay areas. (S)
3. Authorised drivers of ETCS fitted trains may operate in either Level 2 or Level NTC in an overlay area and may switch from Level 2 to Level NTC operation within the area in the event of ETCS becoming degraded. (S)
4. Possible interactions between drivers and other Railway staff for the provision of speed related information, covering:
5. moves across a boundary between overlay and Level 2 only areas and for subsequent operations in the Level 2 only area by authorised drivers. (S)
6. Migration from overlay operation to Level 2 only operation on the same line. (S)
7. The communication of speed limits lower than the applicable line speed for defective on train equipment and ESRs (S)
8. Degraded mode operations. (S)
9. The impact of different Routes deciding to implement different speed unit strategies for drivers that may traverse those routes. (S)
10. Arrangements for the switching of the speed units displayed on the ETCS DMI as per Railway Group Standard GERT8402[[6]](#footnote-6). (S)
11. Agreed arrangements for managing authorised and non-authorised drivers as per ETCS reference design Topic T[[7]](#footnote-7). (S)
12. Criteria to inform the process for deciding whether a line should be metricated or not, in terms of unit choice. (S, P)
13. Risk of confusion given that ETCS specified km/h speedometer has no unit indication (S)
14. Operation of ETCS fitted trains in possessions in Level 0. Current thinking is that all fitted trains in L0 SH mode and that speeds will be displayed in km/h in Level 0. (S)
15. ETCS speed supervision functionality (S, P)
16. Conventional signalling restrictions (spacing, sighting etc.) on permissible speeds (P)

## Out of scope

1. Implications of using metric speed and imperial distance / length information.
2. Implications of metricating the whole GB railway
3. Operations in km/h in Level NTC with TPWS/AWS
4. Operations in mph on Level 2 only lines
5. Operations in Yards, Depots and sidings

# Methodology

Suppliers are expected to explain the methodology that they are intending to use to successfully meet the project objectives and cover the scope. The following should be included in the methodology:

1. Identification of required experts according to Skills, Knowledge and Experience (SKE) Matrices, by discussion with the RSSB technical lead;
2. Preparation of scenarios for Hazard identification (HAZID) workshops, based upon knowledge of GB mainline railway application of ETCS and GB mainline conventional signalling and operations
3. Leadership and facilitation of the Hazard identification workshops.
4. Semi-quantified risk analysis consistent with Network Rail’s risk matrix, included in the HAZID template.
5. It is expected that performance benefits and disbenefits of mph Level 2 operation in an overlay area will be undertaken through a comparison between mph and (optimised) km/h operation over a representative route.
6. The supplier should propose a considered approach that supports or validates the analysis from point 5, this could include some limited simulation or modelling work if deemed necessary.
7. How the consolidation of the results of the safety and performance analyses will be undertaken.

# Deliverables

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| **1.Technical Review** | **Report** |
| This report will consolidate the research already carried out in this area, identify gaps in understanding and summarise current DMI configurations used by both Thameslink and Crossrail (both whom have already started using overlays) |
| This report will be delivered in RSSB format and will be made available on SPARK |

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| **2. Hazard identification briefing note** | **Report** |
| Document that sets out the objectives and scenarios to be considered in the HAZID assessment. |
| This will be sent out to the workshop participants as identified from the SKE matrix. |

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| **3A. Hazard identification** | **Hazard log** |
| A hazard log identifying and ranking the risks. This log will be developed using the RSSB HAZIDS framework.  |
| This report will be made available on SPARK |

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| **3B. Hazard identification workshop report** | **Report** |
| Detailed results of the HAZID including the Hazard log. This report will use the RSSB template and macro to generate the hazard log pages of the reportThis report will outline the risk analysis of each DMI configuration and the issues that need to be considered. The risk analysis will:Be semi-quantified in accordance with the risk matrix included in the RSSB template for the Hazard log.Include a list of scenarios which carry highest and lowest riskMake recommendations for safest DMI configuration |

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| **4. Performance Analysis report** | **Report** |
| A report quantifying the performance impact of operating in mph over (optimised) km/h while in Level 2 operation on a representative route. |
| This report will be made available on SPARK |

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| **5. Consolidation Report** | **Report** |
| A brief document consolidating the results of the hazard and performance analysis and recommending a solution  |
| This report will be delivered in RSSB format and will be made available on SPARK |

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| **6. Research in Brief** | **Report** |
| A four-page document summarising the research, its findings, and the potential benefits generated |
| This report will be delivered in RSSB format and will be made available on SPARK |

# Stakeholders roles and responsibilities

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| --- | --- | --- |
| **Title** | **General role in project** | **Role in acceptance of deliverables** |
| **Delivery manager** | The RSSB delivery manager is the first point of contact during project delivery. The delivery manager responsible for the detailed project management including project schedules, cost reporting and other relevant project management tasks. The delivery 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 RSSB 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 allocated budget for this work is up to £80,000*,* howeverbids above this value will be considered but the supplier will need to provide detailed explanation on why the allocated budget is not adequate. In this case, we strongly encourage suppliers to provide costed options for RSSB to consider.

The work is expected to be completed by end of September 2018. These are indicative dates and RSSB is prepared to consider bids that vary from these expectations if they have a robust and realistic project plan, and an explanation of changes to the proposed start and end dates.

The following dependencies have been recognised:

* ERTMS rollout has already begun and franchises are starting to invest in ETCS equipment
* This project is expected to feed into franchise choice of DMI configuration

# 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:

* Availability of experienced ETCS operational staff for the hazard workshops
* Ties in with the national Digital Railway programme will need to be managed
* Availability of simulation or other equipment to support the performance analysis

Critical Success factors

* A clear and robust conclusion, more detailed than achieved by T1013
* Due consideration of human factors risks associated with metrication.
* Demonstrate experience of safety analysis for GB mainline railway including: conventional signalling and GB application of ETCS
* Demonstrate experience with performance analysis for GB mainline railway including: conventional and GB application of ETCS

**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.

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| --- | --- | --- | --- |
| Name & Address of Sub-Contractor | Service performed for Contractor | Provide details of staff numbers[[8]](#footnote-8) | Provide latest year’s turnover |
| Name:  |  |  |  |  |
| Address: |  |
| Name:  |  |  |  |  |
| Address: |  |
| Name:  |  |  |  |  |
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**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. See Digital Railway document 000000-NWR-DEL-EMF-000001, Digital Railway Toolkit Item: System Migration States Definition, Version 2.0, dated 14/02/2017. [↑](#footnote-ref-1)
2. RSSB (2017), T1013 Analysing the risk of having a mix of imperial and metric measures [↑](#footnote-ref-2)
3. The risk associated with overlay areas has been looked at previously in various RSSB projects ***T1010 Analysing the risk of having a mix of imperial and metric measures*** and ***T1091 Transitions to/ from ERTMS operation - impact on railway operations*** as well as internally by Thameslink and Crossrail. [↑](#footnote-ref-3)
4. Higher here means higher than the conventional permissible speed by more than any rounding error introduced due to converting mph to km/h for transmission via ETCS packets and due to the conversion back to mph for display to the driver by the ETCS onboard. [↑](#footnote-ref-4)
5. [GEGN8646, Guidance on the Common Safety Method for Risk Evaluation and Assessment, Issue 1, December 2017](https://www.rssb.co.uk/rgs/standards/GEGN8646%20Iss%201.pdf) [↑](#footnote-ref-5)
6. [GERT8402, ERTMS/ETCS DMI National Requirements, Issue 2, June 2016](https://www.rssb.co.uk/rgs/standards/GERT8402%20Iss%202.pdf) [↑](#footnote-ref-6)
7. This can be made available on request [↑](#footnote-ref-7)
8. This is the average annual numbers of both staff and managerial staff employed over the last trading year [↑](#footnote-ref-8)