Specification

Research on performance test procedures for petroleum road fuel tankers;
Part A – Review and analysis of accident data, impact conditions and regulations

Department for Transport

Contract Reference: P4/030/0013c

Date: 23rd August 2019
Version: 3

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1. PURPOSE

1.1 The Department for Transport Dangerous Goods Division (DGD) intends to let a contract for the provision of a detailed review and analysis of accident data, impact conditions and regulations pertaining to petroleum road fuel tankers. This contract, referred to as Part A, is the subject of this Specification document, and together with Part B and Part C forms a series of research projects known collectively as WP5. It is anticipated that the outputs from WP5 will underpin UK proposals for performance-based test procedures to be included in the relevant standards and/or regulations.

2. BACKGROUND TO THE CONTRACTING AUTHORITY

2.1 DGD leads on the policy for the safe and secure carriage of dangerous goods by road and rail and has oversight of the sea and air modes. Goods classified as hazardous are vital to our economy and a modern way of life, and can include chemicals for industry, fuel for transport and to heat and light our homes, or batteries which power our electric devices. Movement of such goods is essential, but it must be carried out in a way which minimises the risk of harm to people, property or the environment.

2.2 The Division's objective is therefore to ensure that the regulations continue to safeguard the carriage of dangerous goods, but in a manner that is proportionate and does not needlessly hinder trade. The division also exists to ensure that the UK compliance and enforcement framework is as effective as possible.

2.3 The DGD research programme derives from recent experience with non-compliant petrol tankers which could have led to the failure of some fuel deliveries. The programme supports implementation of lessons learned and further proportionate improvements to the design, construction, testing and inspection of tankers, so as to reduce the risk of non-compliance and avoid further issues. It will also support the UK negotiating position at international standards fora, minimising the risk of disproportionate regulations and backing the UK interest.

3. BACKGROUND TO REQUIREMENT/OVERVIEW OF REQUIREMENT

3.1 Since 2013, the Department for Transport DGD has successfully brought about the withdrawal from service of around 230 non-compliant petroleum tankers manufactured by GRW in South Africa. This withdrawal programme was based on robust evidence from research, which enabled the issue to be resolved without compromising road safety or disrupting fuel supplies. The research reports were published in December 2014 and November 2015 and can be found at www.gov.uk – search for "Petroleum road fuel tankers: technical assessment, December 2014" and "Petroleum fuel tankers: technical assessment, November 2015".

3.2 More recently subsequent research has been completed on welded repairs and the assessment of BS EN 13094 lap and partition joint designs. This research also looked at end dish ruptures of tanks in rollover incidents and at meetings of the relevant standards working group, helped secure agreement on improvements to the tanker design and construction standard aimed at reducing the possibility of end dish ruptures in rollover incidents.

3.3 This more recent research on welded repairs concluded, amongst other things, that the tanker service environment, the level of internal surface saturation and contamination that cannot be mechanically or chemically removed without loss of material thickness, and the weld repair practice adopted will have a significant influence on the success of a welded repair satisfying a commercial standard quality criteria for gas pore and porosity levels.

3.4 The conclusions of this research were taken into account during the preparation of preliminary guidelines for repairs and modification of tanks for the carriage of dangerous goods. Further work would be necessary if the procedures for welded repairs were to be improved.

3.5 Further research commissioned by DGD has informed the acceptance criteria for welding imperfections specified in EN 12972:2018 and, in a related package of work, is looking to establish state-of-the-art requirements for finite element analysis of other aspects of tanker design under rollover, frontal, rear and side impact conditions. The findings of this research are helping to develop a revised version of standard EN13094 to be adopted into regulations for July 2021.

3.6 A further set of linked research projects, known collectively as Work Package 5, will establish performance-based safety test procedures for petroleum fuel tankers that may be used as an alternative to the constraints of the existing design and construction rules. This Statement of Requirements document relates specifically to sub-package Part A, which is to better define the impact scenarios to be used, based on a review of accident data, and to provide an up-to-date review of relevant existing regulations and legislative test procedures. Two other sub-packages are being commissioned separately, but these are not directly relevant to this Statement; Part B is to conduct the physical testing and associated modelling. Part C concerns detailed Engineering Critical Assessments (ECAs).

3.7 It is anticipated the new test procedures will enable manufacturers to develop tank shells using design and construction methods not necessarily depicted in the standards, but which are nevertheless able to sustain rollover, frontal, rear and side impacts without having to use a series of more costly full-scale tests. In so doing, the new test procedures will reduce barriers to new tanker designs and construction technologies, and further improve the regulations and standards.

3.8 For any new test procedures to be used in the construction of petroleum road fuel tankers they would need to be specified in the relevant standard or a national technical code. EN 13094 Design and Construction – Gravity discharge tanks and EN 12972 Testing, inspection and marking of metallic tanks are the standards referenced in ADR for the design, construction, inspection and testing of petroleum road tankers.

4. DEFINITIONS

Expression or Acronym	Definition

ADR	Accord Dangereux Routier (regulations concerning the international transport of dangerous goods by road).
DGD	Department for Transport Dangerous Goods Division.
WP5	Work package 5 of the DGD petroleum road fuel tankers research programme.
ECA	Engineering Critical Assessment - an analysis, based on fracture mechanics principles, of whether a given flaw is safe from fracture, fatigue, creep or collapse under specified loading conditions.
GMH	Department for Transport, Great Minster House, 33 Horseferry Road, London, SW1P 4DR.

5. INDICATIVE PROCUREMENT TIMETABLE

Description	**Date**
Publication of the ITT	Thursday 29th August 2019
Clarification Period starts	Thursday 29th August 2019
Clarification Period closes **Tender Clarifications Deadline**	Thursday 19th September 2019 (12:00 Midday)
Deadline for the publication of responses to Tender Clarification questions	Monday 23rd September 2019 (17:00)
Deadline for submission of Tenders **Tender Submission Deadline**	Thursday 26th September 2019 (12:00 Midday)
Commencement of Evaluation Process	Friday 27th September 2019 (12:00 Midday)
Conclusion of Evaluation Process	Friday 11th October 2019
Potential Conclusion of Standstill Period	Friday 25th October 2019
Potential Contract Award	Friday 25th October 2019

Potential Contract Signature	Tuesday 29th October 2019
Potential Contract Commencement	Friday 1st November 2019

6. SCOPE OF REQUIREMENT

6.1 The scope of the work of Part A is to provide a robust analysis of accident data and regulations relevant to petroleum road fuel tankers, involving rollover, frontal, rear and side impacts, and to support the wider fuel tanker research via peer review. Rigid and articulated heavy goods vehicle tankers are in scope of this research.

6.2 The scope of the work of the Part A Provider is to:

6.2.1 Update the literature review into fuel tanker accidents published in 2014/15.

6.2.2 Update and expand the analyses of fuel tanker collisions published in 2014/15 using suitable national and international data sources.

6.2.3 Update the review of existing regulations and legislative test procedures published in 2014/15.

6.2.4 Contribute peer review expertise on fuel tanker collision scenarios and loadings to the other fuel tanker research projects Parts B & C.

6.2.5 Bring together the findings from the accident data research and review of regulations and standards into a summary report suitable for publication and to feed the findings into the other parts of the research.

6.3 In addition, and to be costed separately as an option to be taken up only if, as and when deemed necessary by DGD, it is anticipated that the provider's senior technical lead for this work, or a suitably qualified and knowledgeable alternate, may be asked to provide support to DGD by participating at some or all of the following domestic and international meetings. Respondents should provide fixed return travel costs and per day/night costs for accommodation, subsistence and/or meeting attendance on a per meeting basis.

6.3.1 Meetings with domestic stakeholders responsible for design, construction, testing and inspection of petroleum fuel tankers (normally held in a mutually convenient location in the UK). Support and participation at such meetings on up to four occasions.

6.3.2 Meetings of national experts and relevant standards working groups; usually held at BSI (Chiswick) and VdTUV (Berlin). Support and participation at such meetings on up to six occasions (please distinguish between costs for individual Chiswick meetings and Berlin meetings).

6.3.3 The UN ECE Joint Meeting Informal Working Group on the inspection and certification of tanks (normally held in London or by exception elsewhere at a mutually convenient location for the Contracting Parties of the European agreement on the ADR) or the UN ECE Joint Meeting Working Group on tanks (normally held in Geneva in September and Bern in March). Support and participation at such meetings on up to three occasions (please distinguish between costs for individual London meetings and meetings in Switzerland).

7. THE REQUIREMENT

7.1 The Department requires a provider to successfully deliver the Part A fuel tanker accident data research to technical, time and budget requirements, producing outputs of a quality that would, if appropriate, withstand the detailed scrutiny that underpinning proposals to amend the relevant standards and regulations would entail. As a minimum it is anticipated this will require the successful provider to:

Review and analysis of accident data and impact conditions

7.1.1 Provide background data and analyses on fuel tanker accidents, e.g. their frequency and how often rollovers, frontal, rear and side impacts lead to fuel spillage and/or tank rupturing, and in what specific circumstances. This will help define the overall risks and inform the physical testing and modelling work (under Parts B & C of WP5) to ensure simulated conditions are as realistic as possible.

7.1.2 For frontal impacts, the provider should aim to consider how the impact load transfers to the tank during a collision (e.g. via the king pin for an articulated tanker). For rollover, rear and side impacts, the provider should consider direct impact damage and deformation mechanisms from, for example, collisions with other vehicles, the road surface and/or roadside structures.

7.1.3 The analyses should make appropriate use of national and international sources of data and information. As a minimum, these sources should include STATS19 linked to the DVSA database to identify “FL” vehicles (road fuel tankers), UK ADR Incident Reports and an international literature review, but other data sources should be included if their likelihood to further enhance the evidence base is cost-effective. The provider should aim to add to and update the accident data evidence gathered and published as part of the 2014 and 2015 reports.

Review and analysis of regulations

7.1.4 The provider should also provide a brief overview of the regulatory landscape impinging on the design of petroleum road fuel tankers, particularly if and how any test conditions have changed (or are planned to change) since the 2014/15 reports were published.

Peer review of wider fuel tanker research

7.1.5 The successful provider will also be expected to contribute peer review time and expertise to the other fuel tanker research work (whether they subsequently have a direct role in the work or not). This will include attendance at regular research team meetings (expected to be at the DfT's offices in Great Minster House (GMH), other Central London locations or elsewhere in the UK) and the reviewing of emerging findings and reports, throughout the duration of the research, to help ensure that the findings of Part A are used appropriately and that the overall proposals are well-founded on realistic impact scenarios and performance tests developed to reflect what actually occurs in collisions and incidents involving fuel tankers.

7.1.6 For costing purposes, respondents should assume that the successful bidder(s) attendance is required at a kick-off meeting and six (quarterly) research team meetings between October 2019 and January 2021, with two of those at GMH/Central London and the rest at locations to be decided elsewhere in the UK.

8. OUTLINE OF OTHER WORK PACKAGE 5 RESEARCH (NOT REQUIRED AS PART OF THIS TENDER) – FOR INFORMATION ONLY

8.1 The purpose of the research will be to develop performance-based safety test procedures for fuel tankers which will provide manufacturers with an alternative to the current prescriptive design requirements. It is anticipated, if the current regulations are amended with alternative requirements that sit alongside the current requirements, that this will provide manufacturers with the freedom to bring more innovative and efficient designs to the market.

8.2 In addition to the research undertaken in Part A, it is anticipated that WP5 will include:

8.2.1 Part B:

8.2.1.1 Decisions on the realistic impact scenarios for testing/modelling.

8.2.1.2 Modelling of complete tankers, to provide a baseline for damage and failure mechanisms under test conditions, validated against the real-world accident damage evidence for, as a minimum, fully loaded tankers.

8.2.1.3 Modelling of tanker sub-sections, to identify suitable modular tests which could provide results equivalent to those for complete tanker tests (based on damage and failure mechanisms).

8.2.1.4 Physical testing of complete tankers and / or tanker sub-sections to replicate realistic frontal, rear, side and rollover impacts and damage.

8.2.2 Part C:

8.2.2.1 Finite Element modelling of selected road fuel tankers designed to the ADR construction rules to determine a benchmark of performance under rollover, frontal, rear and side impacts, and detailed ECAs of particular failure mechanisms and predictions of structural failures and tank ruptures, capable of highlighting any deficiencies that could affect safety in accidents and under normal service conditions.

8.3 The outputs from Parts A, B and C of the research will be brought together by the DfT's appointed project manager in a summary report.

9. KEY MILESTONES

9.1 The milestones outlined below indicate the anticipated timescales for the delivery of the Part A research project.

Deliverable Number	Deliverable Description	Completion Date
WP005A/01	Completion of draft report summarising findings of accident data, impact conditions and regulatory reviews	12 weeks from start date
WP005A/02	Completion of final report summarising findings of accident data, impact conditions and regulatory reviews, suitable for later publication	4 weeks from delivery of draft
WP005A/03	Peer review activities and contributions	From date when Part B & Part C projects begin to January 2021
WP005A/04	If, as and when deemed necessary by DGD, provide support to DGD as appropriate at relevant domestic and international meetings.	From date when Part B & Part C projects begin to January 2021

10. AUTHORITY'S RESPONSIBILITIES

10.1 Not applicable – no specific responsibilities owned by the Authority which may either affect the Potential Provider's ability to deliver the requirement or their costs.

11. REPORTING

11.1 The successful provider shall submit a report every two weeks to the DfT's appointed project manager providing an update on the progress of the research project and the status of any issues identified. It is anticipated that this report shall be in the form of an email and include a single internal document, updated each two week period, summarising key points of the research.

11.2 In light of the timeline we would not expect more than three project meetings to be arranged at either the Provider's site (if appropriate), at any other site(s) where the research may be conducted or at GMH. These will be arranged at mutually convenient times once the contract is in place.

12. CONTINUOUS IMPROVEMENT

12.1 Changes to the way in which the Services are to be delivered must be brought to the Authority's attention and agreed prior to any changes being implemented.

13. SUSTAINABILITY

13.1 Potential providers should be mindful in their response of the Department's priority to deliver safe, secure and sustainable travel. The response should detail any specific impacts on the sustainability of the transport of dangerous goods that are to be considered as part of this research.

14. QUALITY

14.1 The provider should be certified to operate an ISO 9001 accredited management system. Certification to other management systems such as health and safety and/or environment are also desirable and should be referenced in the response.

15. PRICE

15.1 The potential providers must include a cost profile showing the anticipated expenditure for each deliverable (set out in the milestones in section 9 of this document) in their proposal along with overall cost. A separate cost profile for the (optional) meetings attendance tasks set out in section 6.3 must also be provided.

15.2 The final invoice must be at least 10% of the full cost of the contract and prices must be inclusive of all expenses and exclusive of VAT. Any Prices shall remain firm until the end of the contract.

15.3 Travel and accommodation costs shall be booked by the supplier. The cost for all travel and accommodation will be included in the contract value and shall not exceed civil service staff rates without prior agreement from DfT's appointed project manager in the first instance, or the DfT project officer. Guidance on the applicable rates will be provided by the DfT's appointed project manager in the first instance, or the DfT project officer.

15.4 Prices are to be submitted via the Award portal. Access to this system can be obtained by emailing ruth.morley@dft.gov.uk

16. STAFF AND CUSTOMER SERVICE

16.1 The provider's staff appointed for this work must be reputable and independent with demonstrable skills, knowledge and experience in the management and delivery of small-medium scale science and engineering research projects.

16.2 The successful provider's staff appointed for this work will need to have strong international presence in the standards making community and sufficient strength in depth to ensure appropriate representation at industry/peer review meetings.

16.3 The provider's staff will need to work closely with DGD officials and the DfT's appointed Project Manager to present the work as however may be appropriate to both the

standards and legislative bodies. The skills and experience of those who are to undertake the work should be demonstrated by referencing publications, conference presentations, professional qualifications and descriptions of previous projects or case studies.

16.4 The Department considers the essential skills and experience required by the provider's staff are:

16.4.1 Analysing complex accident data from a variety of sources, identifying and reporting its key patterns, trends and implications.

16.4.2 Identifying, assessing and drawing robust conclusions from international regulations relevant to the design and construction of heavy vehicles.

16.4.3 Technical acumen to be able to contribute effectively to peer review activities regarding wider research into petroleum road fuel tanker standards, impact test methodologies and structural modelling.

16.4.4 Project management abilities to ensure timely delivery of required outputs and effective client liaison.

16.5 The Department considers the desirable skills and experience required by the provider's staff to be:

16.5.1 Technical expertise in petroleum road fuel tanker safety issues, ideally with relevant recent experience in accident and regulatory research.

16.5.2 Experience of working collaboratively in/with research consortia.

16.5.3 Experience of contributing technical expertise to international regulatory development procedures relating to vehicle safety, ideally ADR.

16.5.4 Experience in national and international cooperation (in particular on research projects, technical codes and standards).

17. SERVICE LEVELS AND PERFORMANCE

17.1 The Authority will measure the quality of the provider's delivery by:

17.1.1 Delivery of proposals, presentations and reports as detailed in the Milestones section, see section 9 above.

KPI/SLA	Service Area	KPI/SLA description	Target
#1	Delivery timescales and the quality requirements for deliverable WP005A/01	Completion of draft report summarising findings of research	Delivered by the dates specified in the milestones table in section 9.1 and to the quality requirements set out in section 7.1.

#2	Delivery timescales and the quality requirements for deliverable WP005A/02	Completion of final report summarising findings of research	Delivered by the dates specified in the milestones table in section 9.1 and to the quality requirements set out in section 7.1.
#3	Delivery timescales and the quality requirements for deliverable WP005A/03	Peer review activities and contributions	Delivered by the dates specified in the milestones table in section 9.1 and to the quality requirements set out in section 7.1.
#4	Delivery timescales and the quality requirements for deliverable WP005A/04	If necessary, support to DGD at domestic and international meetings	Delivered by the dates specified in the milestones table in section 9.1 and to the quality requirements set out in section 7.1.

18. SECURITY REQUIREMENTS

18.1 The work undertaken is at “official” level and therefore no specific security requirements are necessary.

18.2 “Official” level work is classified by the Department as including routine business operations and services, some of which could have damaging consequences if lost, stolen or published in the media, but are not subject to a heightened threat profile.

19. DATA PROTECTION

19.1 The supplier will be required to comply with all applicable requirements of the Data Protection Legislation (including the General Data Protection Regulation ((EU) 2016/679) (“GDPR”), the Law Enforcement Directive (Directive (EU) 2016/680), and all applicable Law about the processing of personal data and privacy).

20. INTELLECTUAL PROPERTY RIGHTS (IPR)

20.1 The Department for Transport will own all Intellectual Property Rights (IPR) for work generated under this contract and any contracts relating to research under the wider WP5 activity.

21. EVALUATION CRITERIA

21.1 See Appendix B Response Guidance

22. ARRANGEMENT FOR END OF CONTRACT

22.1 All documentation in relation to this contract, including emails, to be transferred to the DfT prior to the completion of this contract.

23. PAYMENT

23.1 Payment can only be made following satisfactory delivery of pre-agreed products and deliverables.

23.2 Before payment can be considered, each invoice must include a detailed breakdown of work completed and the associated costs.

23.3 To ensure prompt payment, a draft copy of invoice must be provided to the DfT's appointed Project Manager in the first instance, or DfT Project Officer for clearance before the final invoice is submitted.

23.4 Once agreed with the DfT Project Manager or Project Officer, the final invoice shall be sent, within 10 days of the end of the month to the period which the claim relates, to: Shared Service Centre, Accounts Payable Team, Sandringham Park, Swansea Vale, Swansea, SA7 0EA.

24. LOCATION

24.1 It is anticipated that the successful provider's technical lead will be based at a location that allows, in a single day, participation in and travel to and from inception, progress and closure meetings that will be held at GMH on the same day.

25. POINTS OF CONTACT

Procurement Contact	Name	Ruth Morley
	Tel	07773 073296
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Project Officer	Name	David Adams
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All queries/ questions should be sent to the procurement contact