Invitation to Quote

Invitation to Quote (ITQ) on behalf of Science and Technology Facilities Council

Subject: Timing System for Vulcan Laser

Sourcing Reference Number RE160441

UK Shared Business Services Ltd (UK SBS)
www.uksbs.co.uk

UKSBS
Shared Business Services

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Section 1 – About UK Shared Business Services

Putting the business into shared services

UK Shared Business Services Ltd (UK SBS) brings a commercial attitude to the public sector; helping our customers improve efficiency, generate savings and modernise.

It is our vision to become the leading provider for our customers of shared business services in the UK public sector, continuously reducing cost and improving quality of business services for Government and the public sector.

Our broad range of expert services is shared by our customers. This allows our customers the freedom to focus resources on core activities; innovating and transforming their own organisations.

Core services include Procurement, Finance, Grants Admissions, Human Resources, Payroll, ISS, and Property Asset Management all underpinned by our Service Delivery and Contact Centre teams.

UK SBS is a people rather than task focused business. It's what makes us different to the traditional transactional shared services centre. What is more, being a not-for-profit organisation owned by its customers, UK SBS' goals are aligned with the public sector and delivering best value for the UK taxpayer.

UK Shared Business Services Ltd changed its name from RCUK Shared Services Centre Ltd in March 2013.

Our Customers

Growing from a foundation of supporting the Research Councils, 2012/13 saw Business Innovation and Skills (BIS) transition their procurement to UK SBS and Crown Commercial Services (CCS – previously Government Procurement Service) agree a Memorandum of Understanding with UK SBS to deliver two major procurement categories (construction and research) across Government.

UK SBS currently manages £700m expenditure for its Customers.

Our Customers who have access to our services and Contracts are detailed here.

Section 2 – About Our Customer

Science and Technology Facilities Council (STFC)

STFC is a world-leading multi-disciplinary science organisation, whose goal is to deliver economic, societal, scientific and international benefits to the UK and its people – and more broadly to the world.

STFC support an academic community of around 1,700 in particle physics, nuclear physics, and astronomy including space science, who work at more than 50 universities and research institutes in the UK, Europe, Japan and the United States, including a rolling cohort of more than 900 PhD students.

The organisation's large-scale scientific facilities in the UK and Europe are used by more than 3,500 users each year, carrying out more than 2,000 experiments and generating around 900 publications.

The combination of access to world-class research facilities and scientists, office and laboratory space, business support, and an environment which encourages innovation has proven a compelling combination, attracting start-ups, SMEs and large blue chips such as IBM and Unilever.

Examples of funded research

- STFC is providing the design infrastructure for the £23bn UK microelectronics sector that underpins strategically important industries worth £78bn to the UK economy
- STFC's ISIS facility and its users, working in partnership with the NHS, developed a novel material to improve the treatment of cleft lip and palate, speeding up healing times and reducing operating costs
- STFC's Synchrotron Radiation Source was used to understand how conventional anti-malarial drugs work, allowing the development of more effective treatment to reduce the devastating global impact of malaria
- STFC's ISIS facility is identifying new materials that can safely and conveniently store hydrogen, enabling the development of hydrogen-fuelled cars reducing reliance on fossil fuels and cutting carbon emissions

www.stfc.ac.uk

Section 3 - Working with UK Shared Business Services Ltd.

In this section you will find details of your Procurement contact point and the timescales relating to this opportunity.

Section 3 – Contact details		
3.1	Customer Name and address	Science and Technology Facilities Council Polaris House North Star Avenue Swindon SN2 1FL
3.2	Buyer name	Jakob Kauusberg
3.3	Buyer contact details	research.tenders@uksbs.co.uk
3.4	Estimated value of the Opportunity	Maximum Budget (2016/2017 Financial Year): £80k excluding VAT Maximum Budget of Total Opportunity: £160,000 excluding VAT
3.5	Process for the submission of clarifications and Bids	**All correspondence shall be submitted within the Emptoris e-sourcing tool. Guidance Notes to support the use of Emptoris is available here.** **Please note submission of a Bid to any email address including the Buyer will result in the Bid not being considered.**

Section 3 - Timescales		
3.6	Date of Issue of Contract Advert and location of original Advert	Thursday 15th December 2016 Contracts Finder
3.7	Latest date/time ITQ clarification questions should be received through Emptoris messaging system	Monday 23rd January 2017 14:00 pm
3.8	Latest date/time ITQ clarification answers should be sent to all potential Bidders by the Buyer through Emptoris	Thursday 26th January 2017 14:00 pm
3.9	Latest date/time ITQ Bid shall be submitted through Emptoris	Tuesday 31st January 2017
3.10	Anticipated rejection of unsuccessful Bids date	Tuesday 7th February 2017

3.11	Anticipated Award date	Thursday 8th February 2017
3.12	Anticipated Contract Start date	Friday 9th February 2017
3.13	Anticipated Contract End date	Friday 30th March 2018
3.14	Bid Validity Period	60 Days

Section 4.0 – Specification

4.1 Introduction to Vulcan Timing System

Vulcan is a single shot high power laser, centred at 1053nm that relies upon components to be triggered to fire. The various trigged components are spread out over a large area and require a timing system to be distributed over an extensive network. The main areas of the laser are: the Oscillator room, Capacitor bank, Laser areas (LA1, LA2, LA3 and LA4), Target area Petawatt (TAP), Target area West (TAW), Target area East (TAE) and the Main control room (MCR).

Oscillator Room

The Oscillator room is the origin of the RF clock and synchronised light pulses that seed the laser. The master oscillator generates the RF signal which is detected optically using a photo diode. Currently there are two master oscillators that generate different RF signals, Titanium Sapphire (Ti:Sapp) and Sesam Saturable Absorbing Mirror (SAM), depending on the laser configuration, TAP or TAW mode. Figure 1 shows how three RF signals are synchronised, using two Kentech Jitter Eaters and Stanford digital delay generator (SRS) to derive 1, 2 and 10Hz signals. There are plans to move to a single oscillator generating the RF for all configurations, but it would be preferable to maintain the multiple RF capability in any future timing system solution.

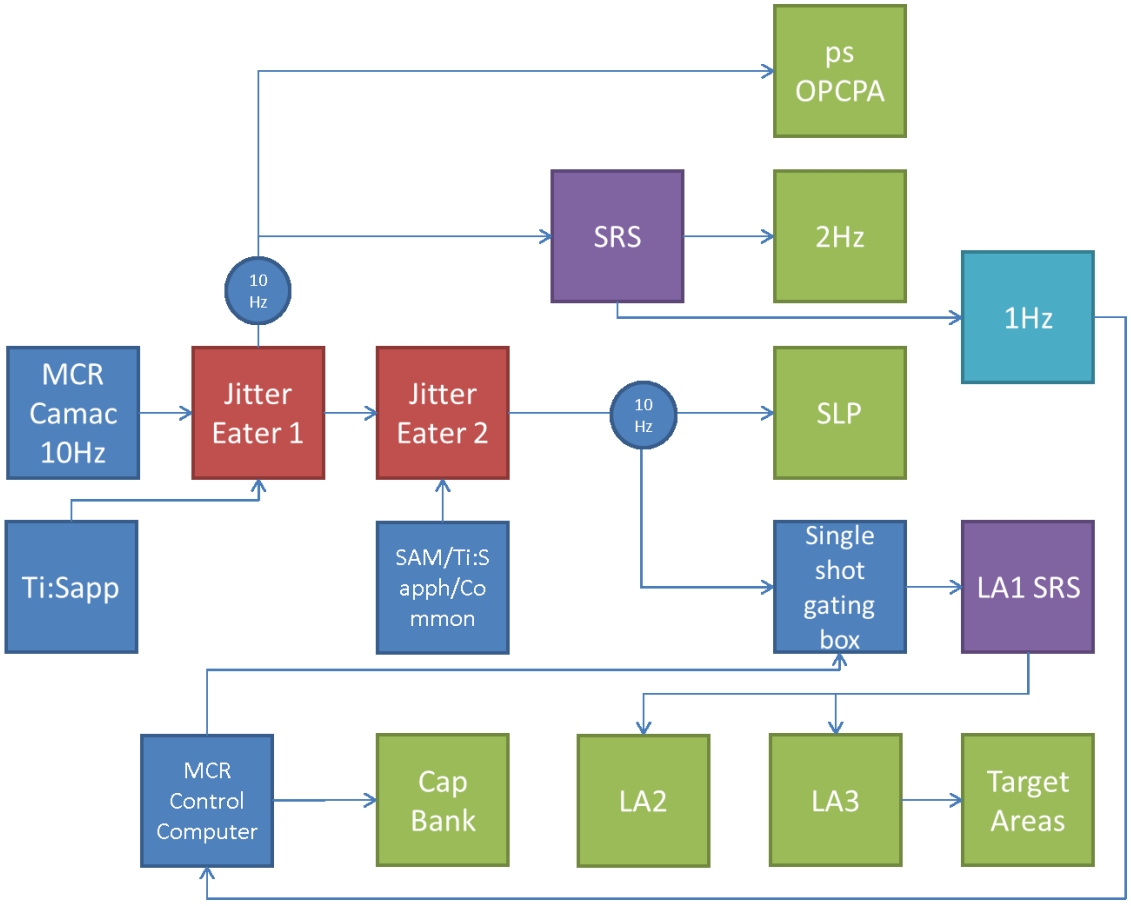

Figure 1 : Simple block diagram of current Vulcan Trigger system

Optical Parametric Chirped Pulse Amplifier (OPCPA)

The Ti:Sapp oscillator is a Spectra Physics Tsunami and is used to generate 80MHz RF and drives a multistage OPCPA system which generates synchronised pulses for TAP configuration. The two OPCPA pumps are driven by a 10Hz signal for the picosecond (ps) and 2Hz for nanosecond (ns) stages. Figure 2 shows the 2Hz ns pump setup, similar to the shaped long pulse (SLP) described later. The 2Hz synchronised signal is used to drive the programmable optical pulse shaper (POPS 10), the contrast and regen (RGA) Pockels cells (PC).

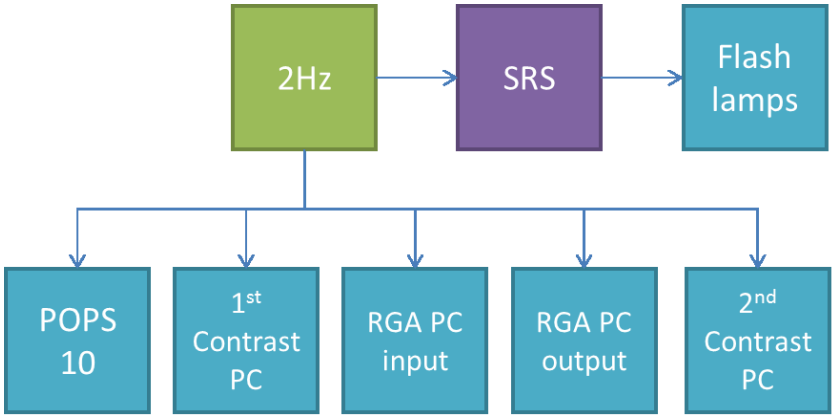

Figure 2: Simple block diagram of the 2Hz ns OPCPA pump stage.

Sesam Saturable Absorbing Mirror (SAM)

Standalone laser that uses SAM to generate mode locked pulses used to generate 80MHz RF and synchronised seed pulses for TAW.

Insight DS

The Insight DS from Spectra Physics is the planned replacement for both Ti:Sapp and SAM oscillators and will drive spate OPCPA systems to TAP and TAW. This will provide a single 80MHz RF input to Vulcan. The Ti:Sapp will be used as a backup system.

Shaped Long Pulse (SLP1 and SLP2)

Currently only one SLP but capability will be expanded to two separate independently timed SLP systems. Figure 3 shows the SLP1 setup, note that SLP2 will be similar but will not run pump diodes off the 10Hz signal.

4.2 Essential Requirements

Please note that the essential requirements for this purchase are all detailed within this section. In the tender exercise there is a separate and scored questionnaire for desirable elements. The individual questions for desirable elements will be linked to the relevant section of this specification, e.g. PROD1.1 relates to desirable additions to 4.2.1.3.1.

Please read both this specification and the Product Desirable Questionnaire carefully when submitting your response and only submit pricing for the product that matches your responses.

UK SBS reserves the right to request a specification to ensure that the right product has been offered for the questions answered and to reject any bids which do not match.

4.2.1 Master Timing Unit

4.2.1(i) The master timing unit will be mountable on a 19" rack

4.2.1(ii) Electrical outputs must be synchronised and phase-locked to internal and external RF

4.2.1.2 **Internal Clock (RF)**

4.2.1.2.1 The unit must have an internal clock

4.2.1.2.2 The clock must be able to operate at multiple derivative frequencies

4.2.1.2.3 The clock must be able to access to 80MHz with low clock drift

4.2.1.2.4 There must be a lock to clock option to synchronise external oscillators

4.2.1.3 **External RF**

4.2.1.3.1 There must be at least one RF input

4.2.1.3.2 The input channels must be for an electrical RF and optical pulse train

4.2.1.3.3 The Master Unit must be able to synchronise and phase lock all free running and single shot triggers to the selected external RF

4.2.1.3.4 When switching between external RFs there must be a maximum of one second between locking from one external frequency to another

4.2.1.4 **Outputs**

4.2.1.4.1 The main link between the Master and the Slave units must be optical

4.2.1.4.2 There must be at least 10 optical outputs for linking Slave units

4.2.1.4.3 All outputs must have independent delays

4.2.2 Slave Units

4.2.2.1 The slave units will be mountable on a 19" rack and be able to operate as standalone units

4.2.2.2 **Inputs**

4.2.2.2.1 There must be one optical and one electrical timing input to synchronise the slave units to the Master unit

4.2.2.2.2 The main link between the Master and the Slave units must be optical

4.2.2.3 **Outputs**

4.2.2.3.1 The Slave units must have 10 electrical outputs

4.2.3 Triggers and Delay Channels

4.2.3.1 Both Master and Slave units must have independent delay channels with a range of 0-10 seconds with ≤5ps resolution, synchronised and phase locked to the Master RF

4.2.3.2 Each unit must be able to generate at least three free running frequencies from kHz to Hz. Ideally they will derive synchronised, phase locked kHz, 10Hz, 2Hz and 1Hz triggers from the Master RF.

4.2.3.3 Each channel must derive independent gated single shot triggers, synchronised and phase locked to the Master RF

4.2.3.4 Each output needs to be individually inhibited manually or programmatically

4.2.3.5 A whole Slave unit needs to have the option of being inhibited by the Master

4.2.4 Jitter

4.2.4.1 External input to output channels must be at most 50ps

4.2.5 Outputs and Communications

4.2.5.1 The communications between Master and Slave units must be optical

4.2.5.2 The main timing/trigger connections between the Master and any Slave units must be via single-mode fibre optic link

4.2.5.3 **Electrical Inputs and Outputs**

4.2.5.3.1 The electrical inputs and outputs must utilise SMA connectors as a minimum with a preference for BNC connectors

4.2.5.3.2 The electrical inputs and outputs trigger threshold must be 5V (50 Ohms)

4.2.5.3.3 The electrical inputs and outputs must have a rise time better than 1ns

4.2.5.3.4 The programmable pulse width must be from 100ns to 100ms

4.2.6 Control

4.2.6.1 Both Master and Slave units must have local and remote control options

4.2.6.2 The units must have front panel access in local mode with the ability of manually changing settings and delay timings

4.2.6.3 The software interface must be compatible with the Vulcan control system

4.2.6.4 The communications between the control software and the units must use Ethernet TCPIP and UDP protocols

4.2.6.5 The units must have an Ethernet port with static IP address

4.2.7 Warranty

Spare parts and labour warranty is required for 12 months.

Order Placement

For absolute clarity this procurement opportunity is for the purchase of one master unit and one slave unit with 12 months spare parts, labour warranty and delivery. We envisage the cost of this to be circa £40K

Following the initial order we will then be placing a secondary order for additional slave units. As detailed within Section 3 our available budget for these two orders is £80K.

Once the new budgets have been allocated for 2017 / 2018 it is our hope to be able to then place a further £80K on more slave units, however at this point we are unable to guarantee this spend.

Section 5 – Evaluation model

The evaluation model below shall be used for this ITQ, which will be determined to two decimal places.

Where a question is 'for information only' it will not be scored.

The evaluation team may comprise staff from UK SBS, the Customer and any specific external stakeholders UK SBS deem required. After evaluation the scores will be finalised by performing a calculation to identify (at question level) the mean average of all evaluators (Example – a question is scored by three evaluators and judged as scoring 5, 5 and 6. These scores will be added together and divided by the number of evaluators to produce the final score of 5.33 (5+5+6 =16÷3 = 5.33)

Pass / fail criteria

Questionnaire	Q No.	Question subject
Commercial	SEL1.2	Employment breaches/ Equality
Commercial	FOI1.1	Freedom of Information Exemptions
Commercial	AW1.1	Form of Bid
Commercial	AW1.3	Certificate of Bona Fide Bid
Commercial	AW3.1	Validation check
Commercial	AW4.1	Contract Terms
Price	AW5.5	E Invoicing
Price	AW5.6	Implementation of E-Invoicing
Quality	AW6.1	Compliance to the Specification

Scoring criteria

Evaluation Justification Statement
In consideration of this particular requirement UK SBS has decided to evaluate Potential Providers by adopting the weightings/scoring mechanism detailed within this ITQ. UK SBS considers these weightings to be in line with existing best practice for a requirement of this type.

Questionnaire	Q No.	Question subject	Maximum Marks
Price	AW5.2	Price	34.5%
Price	AW5.7	Prompt payment	0.5%
Additional Technical	PROD1.1	RF inputs	10%
Additional Technical	PROD1.2	Extension to optical outputs	5%
Additional Technical	PROD1.3	Mirrored electrical outputs	2.5%

Additional Technical	PROD1.4	Number of electrical outputs	5%
Additional Technical	PROD1.5	Independent delay channels range	10%
Additional Technical	PROD1.6	Switching between external input and output channels	5%
Additional Technical	PROD1.7	Connector type	5%
Additional Technical	PROD1.8	Voltages	5%
Additional Technical	PROD1.9	Rise times	7.5%
Additional Technical	PROD1.10	Single-shot trigger threshold	10%

Evaluation of criteria

Non-Price elements

Each question will be judged on a score from 0 to 100, which shall be subjected to a multiplier to reflect the percentage of the evaluation criteria allocated to that question.

Where an evaluation criterion is worth 20% then the 0-100 score achieved will be multiplied by 20.

Example if a Bidder scores 60 from the available 100 points this will equate to 12% by using the following calculation: Score/Total Points available multiplied by 20 (60/100 x 20 = 12)

Where an evaluation criterion is worth 10% then the 0-100 score achieved will be multiplied by 10.

Example if a Bidder scores 60 from the available 100 points this will equate to 6% by using the following calculation: Score/Total Points available multiplied by 10 (60/100 x 10 = 6)

The same logic will be applied to groups of questions which equate to a single evaluation criterion.

The 0-100 score shall be based on (unless otherwise stated within the question):

0	The Question is not answered or the response is completely unacceptable.
10	Extremely poor response – they have completely missed the point of the question.
20	Very poor response and not wholly acceptable. Requires major revision to the response to make it acceptable. Only partially answers the requirement, with major deficiencies and little relevant detail proposed.
40	Poor response only partially satisfying the selection question requirements with deficiencies apparent. Some useful evidence provided but response falls well short of expectations. Low probability of being a capable supplier.
60	Response is acceptable but remains basic and could have been expanded upon. Response is sufficient but does not inspire.
80	Good response which describes their capabilities in detail which provides high levels of assurance consistent with a quality provider. The response includes a full description of techniques and measurements currently employed.
100	Response is exceptional and clearly demonstrates they are capable of meeting the requirement. No significant weaknesses noted. The response is compelling in its description of techniques and measurements currently employed, providing full assurance consistent with a quality provider.

All questions will be scored based on the above mechanism. Please be aware that the final score returned may be different as there may be multiple evaluators and their individual scores will be averaged (mean) to determine your final score.

Example

Evaluator 1 scored your bid as 60

Evaluator 2 scored your bid as 60

Evaluator 3 scored your bid as 40

Evaluator 4 scored your bid as 40

Your final score will (60+60+40+40) ÷ 4 = 50

Price elements will be judged on the following criteria.

The lowest price for a response which meets the pass criteria shall score 100.
All other bids shall be scored on a pro rata basis in relation to the lowest price. The score is then subject to a multiplier to reflect the percentage value of the price criterion.

For example - Bid 1 £100,000 scores 100.
Bid 2 £120,000 differential of £20,000 or 20% remove 20% from price scores 80
Bid 3 £150,000 differential £50,000 remove 50% from price scores 50.
Bid 4 £175,000 differential £75,000 remove 75% from price scores 25.
Bid 5 £200,000 differential £100,000 remove 100% from price scores 0.
Bid 6 £300,000 differential £200,000 remove 100% from price scores 0.

Where the scoring criterion is worth 50% then the 0-100 score achieved will be multiplied by 50.

In the example if a supplier scores 80 from the available 100 points this will equate to 40% by using the following calculation: Score/Total Points multiplied by 50 (80/100 x 50 = 40)

The lowest score possible is 0 even if the price submitted is more than 100% greater than the lowest price.

Once the evaluation process and due diligence is complete, should the result of the process result in a tied place(s) then the supplier(s) who scored the highest total in the Price criterion (Question) shall be considered the successful supplier and shall be awarded the opportunity.

Section 6 – Evaluation questionnaire

Bidders should note that the evaluation questionnaire is located within the **e-sourcing questionnaire.**

Guidance on completion of the questionnaire is available at http://www.uksbs.co.uk/services/procure/Pages/supplier.aspx

PLEASE NOTE THE QUESTIONS ARE NOT NUMBERED SEQUENTIALLY

Section 7 – General Information

What makes a good bid – some simple do's ☺

DO:

7.1 Do comply with Procurement document instructions. Failure to do so may lead to disqualification.

7.2 Do provide the Bid on time, and in the required format. Remember that the date/time given for a response is the last date that it can be accepted; we are legally bound to disqualify late submissions.

7.3 Do ensure you have read all the training materials to utilise e-sourcing tool prior to responding to this Bid. If you send your Bid by email or post it will be rejected.

7.4 Do use Microsoft Word, PowerPoint Excel 97-03 or compatible formats, or PDF unless agreed in writing by the Buyer. If you use another file format without our written permission we may reject your Bid.

7.5 Do ensure you utilise the Emptoris messaging system to raise any clarifications to our ITQ. You should note that typically we will release the answer to the question to all bidders and where we suspect the question contains confidential information we may modify the content of the question to protect the anonymity of the Bidder or their proposed solution

7.6 Do answer the question, it is not enough simply to cross-reference to a 'policy', web page or another part of your Bid, the evaluation team have limited time to assess bids and if they can't find the answer, they can't score it.

7.7 Do consider who your customer is and what they want – a generic answer does not necessarily meet every customer's needs.

7.8 Do reference your documents correctly, specifically where supporting documentation is requested e.g. referencing the question/s they apply to.

7.9 Do provide clear and concise contact details; telephone numbers, e-mails and fax details.

7.10 Do complete all questions in the questionnaire or we may reject your Bid.

7.11 Do check and recheck your Bid before dispatch.

What makes a good bid – some simple do not's ☹

DO NOT

7.12 Do not cut and paste from a previous document and forget to change the previous details such as the previous buyer's name.

7.13 Do not attach 'glossy' brochures that have not been requested, they will not be read unless we have asked for them. Only send what has been requested and only send supplementary information if we have offered the opportunity so to do.

7.14 Do not share the Procurement documents, they are confidential and should not be shared with anyone without the Buyers written permission.

7.15 Do not seek to influence the procurement process by requesting meetings or contacting UK SBS or the Customer to discuss your Bid. If your Bid requires clarification the Buyer will contact you.

7.16 Do not contact any UK SBS staff or Customer staff without the Buyers written permission or we may reject your Bid.

7.17 Do not collude to fix or adjust the price or withdraw your Bid with another Party as we will reject your Bid.

7.18 Do not offer UK SBS or Customer staff any inducement or we will reject your Bid.

7.19 Do not seek changes to the Bid after responses have been submitted and the deadline for Bids to be submitted has passed.

7.20 Do not cross reference answers to external websites or other parts of your Bid, the cross references and website links will not be considered.

7.21 Do not exceed word counts, the additional words will not be considered.

7.22 Do not make your Bid conditional on acceptance of your own Terms of Contract, as your Bid will be rejected.

Some additional guidance notes

7.23 All enquiries with respect to access to the e-sourcing tool and problems with functionality within the tool may be submitted to Crown Commercial Service (previously Government Procurement Service), Telephone 0345 010 3503.

7.24 Bidders will be specifically advised where attachments are permissible to support a question response within the e-sourcing tool. Where they are not permissible any attachments submitted will not be considered.

7.25 Question numbering is not sequential and all questions which require submission are included in the Section 6 Evaluation Questionnaire.

7.26 Any Contract offered may not guarantee any volume of work or any exclusivity of supply.

7.27 We do not guarantee to award any Contract as a result of this procurement

7.28 All documents issued or received in relation to this procurement shall be the property of UK SBS.

7.29 We can amend any part of the procurement documents at any time prior to the latest date / time Bids shall be submitted through Emptoris.

7.30 If you are a Consortium you must provide details of the Consortiums structure.

7.31 Bidders will be expected to comply with the Freedom of Information Act 2000 or your Bid will be rejected.

7.32 Bidders should note the Government's transparency agenda requires your Bid and any Contract entered into to be published on a designated, publicly searchable web site. By submitting a response to this ITQ Bidders are agreeing that their Bid and Contract may be made public

7.33 Your bid will be valid for 60 days or your Bid will be rejected.

7.34 Bidders may only amend the Contract terms if you can demonstrate there is a legal or statutory reason why you cannot accept them. If you request changes to the Contract and UK SBS fail to accept your legal or statutory reason is reasonably justified we may reject your Bid.

7.35 We will let you know the outcome of your Bid evaluation and where requested will provide a written debrief of the relative strengths and weaknesses of your Bid.

7.36 If you fail mandatory pass / fail criteria we will reject your Bid.

7.37 Bidders are required to use IE8, IE9, Chrome or Firefox in order to access the functionality of the Emptoris e-sourcing tool.

7.38 Bidders should note that if they are successful with their proposal UK SBS reserves the right to ask additional compliancy checks prior to the award of any Contract. In the event of a Bidder failing to meet one of the compliancy checks UK SBS may decline to proceed with the award of the Contract to the successful Bidder.

7.39 All timescales are set using a 24 hour clock and are based on British Summer Time or Greenwich Mean Time, depending on which applies at the point when Date and Time Bids shall be submitted through Emptoris.

7.40 All Central Government Departments and their Executive Agencies and Non Departmental Public Bodies are subject to control and reporting within Government. In particular, they report to the Cabinet Office and HM Treasury for all expenditure. Further, the Cabinet Office has a cross-Government role delivering overall Government policy on public procurement - including ensuring value for money and related aspects of good procurement practice.

For these purposes, UK SBS may disclose within Government any of the Bidders documentation/information (including any that the Bidder considers to be confidential and/or commercially sensitive such as specific bid information) submitted by the Bidder to UK SBS during this Procurement. The information will not be disclosed outside Government. Bidders taking part in this ITQ consent to these terms as part of the competition process.

7.41 From 2nd April 2014 the Government is introducing its new Government Security Classifications (GSC) classification scheme to replace the current Government Protective Marking System (GPMS). A key aspect of this is the reduction in the number of security classifications used. All Bidders are encouraged to make themselves aware of the changes and identify any potential impacts in their Bid, as the protective marking and applicable protection of any material passed to, or generated by, you during the procurement process or pursuant to any Contract awarded to you as a result of this tender process will be subject to the new GSC from 2nd April 2014. The link below to the Gov.uk website provides information on the new GSC:

https://www.gov.uk/government/publications/government-security-classifications

UK SBS reserves the right to amend any security related term or condition of the draft contract accompanying this ITQ to reflect any changes introduced by the GSC. In particular where this ITQ is accompanied by any instructions on safeguarding classified information (e.g. a Security Aspects Letter) as a result of any changes stemming from the new GSC, whether in respect of the applicable protective marking scheme, specific protective markings given, the aspects to which any protective marking applies or otherwise. This may relate to the instructions on safeguarding classified information (e.g. a Security Aspects Letter) as they apply to the procurement as they apply to the procurement process and/or any contracts awarded to you as a result of the procurement process.

USEFUL INFORMATION LINKS

- Emptoris Training Guide
- Emptoris e-sourcing tool
- Contracts Finder
- Tenders Electronic Daily
- Equalities Act introduction
- Bribery Act introduction
- Freedom of information Act