Statement of Requirement (SoR)

Reference Number	1000163817
Version Number	1.0 DSTL/DOC132097
Date	21/05/2021

1.	Requirement
1.1	Title
	[REDACTED – Defence]Waveform Development
1.2	Summary
	[REDACTED – Defence]
1.3	Background
	 [1]. QinetiQ Ltd. Semiconductor [REDACTED – Defence] Phase 1 – [REDACTED – Defence] Devices: Final Report. QINETIQ/21/00238 v2.0. March 2021. [REDACTED – Defence].
1.4	Requirement

<u>Aim</u>

The aim of this task is to define a preliminary specification for a radiated waveform (or waveforms) capable of delivering selected [REDACTED – Defence] mechanisms into a defined target set. As with previous research [1] a detailed understanding of the underlying physical processes must be demonstrated in each case.

<u>Scope</u>

The scope of this task comprises three main areas, namely; reference target set definition, continued model development and waveform specification/demonstration. Further details for each of these activities are provided below:

1. <u>Reference Target Set Definition</u>

A target set is required for this task to support practical experiments and demonstrations for example, and also to provide a reference against which required waveforms may be developed. It is important that this target set includes relevant [REDACTED – Defence] whilst also remaining representative of likely operational deployments and military tasks.

[REDACTED – Defence]

2. Model Development

Previous work [1] has reported a number of constraints and limitations associated with the model originally developed in support of this research. The following tasks relate to the continued development and validation of this model. For reference, applicable sections from [1] are provided in parenthesis.

As is the general case for modelling and simulation activity associated with this project, it is important that all models are developed only to the point where they are considered suitable for accomplishing specified research objectives; and nothing more.

[REDACTED – Defence]

3. Waveform Specification/Demonstration

[REDACTED – Defence]

Whilst there is no restriction on the total number of waveforms required it is desirable for these to be minimised where, ideally, a single waveform would be effective against all devices in the reference target set. Where applicable, consideration shall also be given to operation against targets in a wider context (including with different bias configurations for example), with a view to identifying any specific sensitivities and/or bounding envelopes that might apply.

Initial development can be by conducted or radiated techniques. If the former case is adopted (to minimise uncontrolled variables for example), a clear view to radiated techniques must be maintained from the outset; both from a radio frequency physics perspective and also in regards to operational deployment.

All waveforms shall be demonstrated experimentally against one or more of the project reference targets.

To aid radiated waveform specification, Dstl have previously developed a physics based 'statistical performance' model that includes the ability to undertake a Monte Carlo analysis for a wide range of modelled variables. Using this approach the model can aid both understanding of RF coupling physics, whilst also providing a statistical assessment of likely performance in scenarios comprising multiple, uncontrolled variables. Dstl propose to make this model available, subject to agreement of release conditions, at contract award – see GFE below.

Assumptions and Limitations

[REDACTED – Defence]

Confidence

For a given technique to be operationally useful, its performance against a defined target set must be quantified to a stated degree of confidence. Whilst there is no formal requirement to provide any measure of confidence at this stage, a longer term view in this regard must be maintained throughout. Use of Dstl's statistical performance model is likely to be relevant in this respect.

Government Furnished Information (GFI)

Dstl will provide advice and guidance in support of target related activities throughout the task, as and when required.

Government Furnished Equipment (GFE)

To aid with the development of waveforms, Dstl may be in a position to lend items of test equipment such as [REDACTED – Defence]and associated ancillaries for example. Support with their subsequent set-up and operation may also be available should this be required. The need for such equipment/support shall be agreed initially at contract award and remain open to review for the task duration.

Pulsed RF Statistical Performance Model

[REDACTED – Defence]

Dstl are happy to make the model available for use during this task, subject to completion of a model release letter beforehand.

Security

[REDACTED – Defence]

Definitions

A series of guideline definitions have been produced to help bound the project and remain open to change/modification subject to agreement of all relevant stakeholders. These are provided at Appendix A below.

Deliverables

See section 1.6

Notes:

• DEFCON 705 Full Rights for all deliverables

	 Slide packs to be provided in advance for any presentations. 					
	 Teleconference preferred for meetings if classification allows. Practical demonstration to be held at contractors premises unless agreed otherwise. 					
	 Final presentation and practical demonstration are separate deliverables to mitigate for COVID 19 restrictions if applicable. 					
	 Classification to be determined by original SAL and email supplement dated 22/10/2019. 					
	• Final reports shall describe the entire work performed under the Contract in sufficient detail to comprehensively explain the work undertaken and results achieved including all relevant technical details of any hardware, software, process or system developed there under. The technical detail shall be sufficient to permit independent reproduction of any such process or system, without any prior knowledge of these.					
	Appendix A – Definitions					
	[REDACTED – Defence]					
1.5	Options or follow on work (<i>if none, write 'Not applicable'</i>)					

1.6	Deliverables & Intellectual Property Rights (IPR)						
Ref.	Title	Due by	Format	TRL*	Expected classification (subject to change)	What information is required in the deliverable	IPR DEFCON/ Condition (Commercial to enter later)
D1	Kick-off Meeting	ТО	Teleconference and/or face to face meeting with supporting slide pack	-	[REDACTED – Defence]	Introduction and discussion of proposed approach with any initial issues or questions raised.	DEFCON 705 shall apply
D2	Informal Progress Meetings (Min. 2 off)	Minimum 2 off; 1 either side of D3. Otherwise as required.	Teleconference with supporting slide packs as required	-	[REDACTED – Defence]	Flexible format to discuss progress and matters arising. Dstl acknowledges that the nature of this task requires a flexible approach from the outset, with many aspects subject to agreement and/or revision as progress is made. Use of additional review meetings and other informal communications are considered essential to the successful delivery of this task and are positively encouraged throughout.	DEFCON 705 shall apply

D3	Interim Report	Halfway point or thereabouts Suggest T0 + 13 wks.	Softcopy. MS Word & Adobe PDF.	3	[REDACTED – Defence]	Draft technical report describing progress to date. To be delivered a minimum of 5 working days before interim progress review at D4 to enable sufficient time for Dstl review.	DEFCON 705 shall apply
D4	Interim Progress Review	D3 + 5 days	Teleconference with supporting slide pack	-	[REDACTED – Defence]	Meeting to discuss interim report feedback and agree an appropriate way forward.	DEFCON 705 shall apply
D5	Draft Final Report	D7 – 5 days	Softcopy. MS Word & Adobe PDF.	3	[REDACTED – Defence]	Draft technical report fully describing all work undertaken, including a full list of references. To include a preliminary waveform specification as per SoR. To include model user guide if applicable. To be delivered a minimum of 5 working days before final presentation meeting at D7 to enable sufficient time for Dstl review.	DEFCON 705 shall apply
D6	Associated Models	D5	Model source code			All models to be delivered together with draft final report and must be compatible	DEFCON 705 shall apply

					with Dstl's existing statistical performance model.	
D7	Final Presentation	ТВА	Face to face meeting and/or teleconference with supporting slide pack.		Meeting to discuss conclusions and recommendations reported at D5, plus any additional Dstl feedback.	DEFCON 705 shall apply
D8	Practical Demonstration	ТВА	Face to face meeting at contractors premises		Minimum requirement is for a practical demonstration of specified waveform(s) against the reference target set, using conducted or radiated techniques as required. May be combined with final presentation meeting at D7 if circumstances permit. To include model handover workshop if applicable.	DEFCON 705 shall apply
D9	Final Report	D7 + 10 days Suggest T0 + 26 wks.	Softcopy. MS Word & Adobe PDF.		Up-issued final report incorporating any changes notified at the final presentation meeting D7.	DEFCON 705 shall apply

*Technology Readiness Level required

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1.7	Standard Deliverable Acceptance Criteria
1.8	Specific Deliverable Acceptance Criteria

2.	Quality Control and Assurance					
2.1	Quality Control and Quality Assurance processes and standards that must be met by the contractor					
	□ ISO9001 (Quality Management Systems)					
	□ ISO14001 (Environment Management Systems)					
	\Box ISO12207 (Systems and software engineering — software life cycle)					
	□ TickITPlus (Integrated approach to software and IT development)					
	☑ Other: (Please specify below)					
	Proposal must include quality plan					
2.2	Safety, Environmental, Social, Ethical, Regulatory or Legislative aspects of the requirement					
	No significant aspects					

3.	Security				
3.1	Highest security classification	n			
	Of the work	[REDACTED – Defence]			
	Of the Deliverables/ Output	[REDACTED – Defence]			
3.2	Security Aspects Letter (SAL)			
	Yes				
	If yes, please see SAL reference- 1000163817				
3.3	Cyber Risk Level				
	Low				
3.4	Cyber Risk Assessment (RA) Reference				
	Click or tap here to enter text.[RE	DACTED – Defence]			
	If stated, this must be completed by the contractor before a contract can be awarded. In				
	accordance with the Supplier Cyber Protection Risk Assessment (RA) Workflow please				
	complete the Cyber Risk Asses	ssment available at			
	https://suppliercyberprotection.	service.xgov.uk/			

4. Government Furnished Assets (GFA)

GFA to be Issued - Yes

GFA No.	Unique Identifier/ Serial No	Description:	Available Date	Issued by	Return Date or Disposal Date (T0+)
GFA-1	N/A	CST Pulsed RF Statistical Performance Model	During contract	Dstl	Dispose at contract end

	on	
	request	

5.	Proposal Evaluation criteria
5.1	Technical Evaluation Criteria
	A clear, robust and concise technical plan detailing how the requirement will be met, demonstrating value for money.
5.2	Commercial Evaluation Criteria
	 No limiting IP issues. Any background IP claims must be specified in the proposal. Complies with EW&C T&Cs The total cost should not be more than £150k