Serapis Tasking Form

Tasking Form Part 1: *(to be completed by the Authority's Project Manager)*

To:	Lot 4 QinetiQ Plc	**From:**	Dstl

Any Task placed as a result of your quotation will be subject to the Terms and Conditions of Framework Agreement Number:

LOT 4 DSTL/AGR/SERAPIS/AII/01

VERSION CONTROL

Version 0.a

REQUIREMENT

Proposal Required by:	Oct 21	**Task ID Number:**	AII79
The Authority Project Manager:	[REDACTED]	**The Authority Technical Point of Contact:**	[REDACTED]
Task Title:	DCEAT WP4.1 Operational Agility - Generation after next (GAN) communications-environment modelling and forecasting tools.		
Required Start Date:	Nov 21	**Required End Date:**	05/03/2024
Requisition No:	1000167848	**Budget Range**	£150k (year 1)

TASK DESCRIPTION AND SPECIFICATION

Serapis Framework Lot	☐ Lot 1: Collect ☐ Lot 2: Space systems ☐ Lot 3: Decide ☒ Lot 4: Assured information infrastructure ☐ Lot 5: Synthetic environment and simulation ☐ Lot 6: Understand

Statement of Requirements (SOR)

Background

Military operational environments include underwater, underground (i.e. tunnels, caves) terrestrial (i.e. terrain, vegetation, buildings), tropospheric (i.e. the weather) and space environments. These environments all impact the performance of a communications system due to attenuation, reflections, doppler, scattering, etc. Although system designers aim to mitigate the effects of the operating environments, it is not possible to mitigate all the possible effects due to the cost, size and weight compromise that are have to made. The operating environment, therefore, becomes the ultimate limiting factor in the performance of a communications system. These communications environments are also not static and may change through the lifetime of a communications system or during a mission. These changes could be intentional through artificial means or natural (i.e. weather changes).

Technologies vital for the generation-after-next communications capabilities are those beginning to emerge now and in the near future. New communications systems (from underwater to space) for the generation after next capabilities will be critical for Pervasive, full spectrum, multi domain Intelligence,

Surveillance and Reconnaissance (ISR) and Multi-domain Command & Control, Communications and Computer (C4) systems to enable Freedom of Access and Manoeuvre (FOAM) decisions to me made.

In some areas, particularly digital, communications systems are evolving at a rapid pace and there will be a need to rapidly assess, through modelling, the communications feasibility in realistic operating environments. This communications modelling will be needed to guide initial concept development and then it will be needed to maximise the communications performance in real-environments. The ability to accurately forecast communications performance in complex natural and built environments will be critical to support the planning and deployment of ISR or C4 capabilities to support global operations. A key ability of these modelling/forecasting system will be to distinguish between natural and intentional/un-intentional effects the environment may have on communications performance.

To achieve this a range of communications modelling capabilities will be needed to underpin the Science and Technology (S&T) strategy and support the development of the generation-after-next communications technologies for the "Deployed Communications Evolving Against the Threat" (DCEAT) S&T theme.

The communications modelling-capability should build on MoD's key strategic direction to move towards an Information-Age Integrated-Force that "*harnesses data, digitisation and technology and enables the concept of Information led operations where the information is exploited at speed to provide advantage*". The collection of this ISR information supported by C4 and a new digital backbone provides new opportunities to further exploit this data and provide additional value (at minimal cost) by using it to underpin the modelling/forecasting of communications system performance and hence predict or mitigate the effects of the operating environment to support decision making.

This ISR data being collected will need to be coupled with other environment data and information sources such as; oceanographic, meteorological, terrain data and integrated with communications systems performance models and measurements, AI techniques, bespoke measurement systems and new operational scenario.

These future challenges in a C4 environment, that future modelling tools should support, include the need for:

- new techniques and technologies that mitigate against rapidly emerging communications threats
- radio systems to operate in an denied, degraded and RF environment due to spectrum congestion and/or interference,
- resilient and robust communications systems[REDACTED],
- connectivity to all mobile/static platforms (land, sea, underwater, air),
- communications links that can support communications ranges beyond line of sight and short range,
- communications capacities from low to very high data rate systems
- global operations, often infrastructure less environment
- conducting operations that range from disaster relief, peacekeeping, surveillance to military engagement
- interoperability with national and international partners
- [REDACTED]
- new architectures/protocols
- systems that are application aware
- satisfying convergence of systems and networks

Aim

The aim is to develop measurements, modelling and forecasting tools, that take into account the communications operating-environment, to guide the development and ultimate operation of the Generation after Next communications systems. This will support the S&T needed for "Deployed Communications Evolving Against the Threat" (DCEAT) research theme. The aim is to maximise the

value of information already being collected by military systems and intelligently merge it with other trusted data sources already available.

These modelling tools will support research into:

1. Materials S&T
2. Advanced waveform development:
3. Advanced Antennas and Transceivers
4. New and novel bearers
5. Operational agility

The modelling tools and system developed will drive the development of Resilient Deployed Communications Systems to stay ahead of the threat, respond rapidly to new threats and exploit new technologies into MoD spiral development approaches. The ultimate research outcomes will enable MOD to rapidly develop and field new technologies cost effectively, to sustain effective C2 and Communications in the Denied, Degraded, Intermittent and Low-Bandwidth environments, ideally from deep ocean to Space, that characterise the contemporary and future battlespace.

Requirement

The outline requirements are to develop the generation after next communications modelling tools and system i.e. communications-environment and propagation tools, measurement systems and channel data.

Activities could include:

Year 1

1. Set-up and Chair a technical management team to provide strategic direction and propose research direction.
2. Develop operational scenarios to guide the communications models needed
3. Identify future C4ISR and C2 systems that would benefit from the capability (i.e cross cutting capabilities)
4. Identify defence related and open (environment) data sources that could be used as the basis for propagation models from below water to space (excluding ionospheric data)
5. Identify propagation models that could be coupled with environment data to provide system performance measurements
6. Outline the key architectural components needed for a decision aids
7. Summarise potential natural and artificial propagation effects for (i.e. non-ionospheric) systems that may impact the generation after next communications systems.
8. [REDACTED].
9. Develop the concept of a generic multipath/Angle of arrival model [REDACTED].
10. Identify international standards that could be influenced
11. Highlight potential international collaborative events (e.g. MoU, TTCP)

Year 2

1. Maintain the technical management team to provide strategic direction and propose research direction
2. Continue the development via initial experimentation/simulation of the [REDACTED]propagation detection system.

3. Initial concept demonstration of using open and defence data source as input to a propagation model
4. Demonstrate initial concept of predictions of using open and defence data source with real time measurements.
5. Investigate the application of AI techniques to identify anomalous propagating signals
6. Highlight application of tools and systems in the C2 environment
7. Correlate model with channel measurement data
8. Develop initial multipath model.
9. Input to international standards.

Year 3

1. Maintain the technical management team to provide strategic direction and propose research direction
2. Demonstrate TRL level 6 tools and techniques
3. Highlight benefits of developing tools to higher TRL
4. Develop an integration roadmap
5. An integrated propagation modelling facility for system level outputs to guide system design.

Innovation Benefits and Exploitation Plan (IBEP)

By conducting the work the following are anticipated.

1. Innovation – (i.e. what are we building on?)
    a. Experimentation and modelling experience (e.g. mitigating ionosphere effects)
    b. S&T trends
    c. Spectrum [REDACTED] challenges
    d. NSC proposition [REDACTED]

2. Benefits (i.e. what will the contracted stakeholders get from this?)
    a. Development of new capabilities
    b. Closer defence-sector collaboration
    c. Increased collaboration between industry, academia and government.

3. Exploitation (what are the artifacts that Dstl will get that can be more widely exploited)
    a. New propagation models and data
    b. Know-how in the wider supply chain for design tools

4. Plan (what's the plan for exploitation)
    a. Integration into C2 processes and procedures
    b. Exploitation and re-use of information for defence purposes

Outputs.

Outputs (or artefacts) of the activities that may be exploited more widely include:

- New models and algorithms
- Measurement data
- Conference and journal papers
- Threat information
- [REDACTED] Assessments of technologies

Deliverables.

Deliverables of the project are suggested in in the Deliverables section and will be agreed during proposal development.

Procurement Strategy

☒ Lot Lead to recommend ☐ Single Source / Direct Award

Pricing:

☒ Firm Pricing ☐ Ascertained Costs* ☐ Other*

Firm Pricing shall be in accordance with DEFCON 127 and DEFCON 643

Ascertained Costs shall be in accordance with DEFCON 653 or DEFCON 802.

*only at Authority's discretion

Task IP Conditions

Task IP Conditions (Follow the NIPPY guide to identify your information and IP requirements for each deliverable)	**Summary of the Authority's rights in foreground IP (IP generated by the supplier in performance of the contract)**
DEFCON 703 ☐	Vests ownership with the Authority
DEFCON 705 Full Rights ☒	Enables MOD to share in confidence as GFI or IRC under certain types of agreements. Can be shared in confidence within UK Government.
OTHER IP DEFCONS: 14* ☐, 15* ☐, 16* ☐, 90* ☐, 91* ☐, 126* ☐	Generally only suitable for deliverables at TRL 6 and above.
BESPOKE IP Clause ☐ *	Details to be added and agreed by IP Group
* Do not use without IPG advice and approval	
Please state in this text box if MOD or the customer has a requirement a) that one or more Other Government Departments is able to share confidentially with their own suppliers, b) to publish but you do not think there is a requirement to own or control the deliverable, or c) to share under a procurement Memorandum of Understanding (MOU).* *If any of these three issues applies, please contact IPG for advice before completing this form. *Listing research MOUs is not required, but can be a helpful courtesy to the supplier.*	

DELIVERABLES

Ref	Title	Due by	Format	TRL	Expected classification (subject to change)	Information required in deliverable	IPR DEFCON

D-1	Monthly progress reports (MPR)	T0+1 month	Presentation		Official	PORT (progress, opportunities, Risks, Timelines) quad chart presentation pack	705
D-2	*Quarterly Progress and Technical Review (QPTR)*	*T0+3 Months*	*Presentation (.pptx)*		*Official-*	Presentation pack to include but not limited to: • Update on technical progress • Progress report against project schedule. • Review of risk management plan. • Commercial aspects. • Review of deliverables. • Risks/issues. • GFA and supplier performance	*705*
D-3	*Six-monthly progress reports* *(SPR)*	*T0+6*	*Report (Word)*		*Official*	Report to include: • Aims • Technical Progress • Achievements • Exploitable outputs	
D-4	Annual progress report (APR)	T0-12	Report		Official	Report to include: • Aims • Technical Progress • Achievements • Exploitable outputs	
D-5	Annual conference presentation (ACP)	T0+12	Presentation		Official	Presentation to an annual meeting (or conference) attended by a range of stakeholders.	

DELIVERABLE: ACCEPTANCE / REJECTION CRITERIA

Unless otherwise stated below, Standard Deliverable Acceptance / Rejection applies. This is 30 business days, in accordance with DEFCON 524 Rejection, and DEFCON 525 Acceptance.

Standard Deliverable Acceptance / Rejection:-

Yes ☒ (DEFCON 524 Rejection, and DEFCON 525 Acceptance)

No ☐ (if no, please state details of applicable criteria below)

Deliverable Acceptance / Rejection Criteria:-

If there are any other specific acceptance/rejection criteria you would like to apply to any of the deliverables, please state them here.

Government Furnished Assets (GFA)

ISSUE OF EQUIPMENT/RESOURCES/INFORMATION/FACILITIES (*if not applicable, delete table and insert "None" in this text box)*

Unique Identifier/ Serial No	Description	Classification	Type	Available Date	Issued by	Return or Disposal Date	Any restrictions?

Serial no	*Description*	*Official-Sensitive*	*Equipment*	*00/00/0000*	*Issuer*	*00/00/0000*	*Include details here*
N/A	N/A						

QUALITY STANDARDS

☐ **ISO9001** (Quality Management Systems)

☐ **ISO14001** (Environment Management Systems)

☐ **ISO12207** (Systems and software engineering — software life cycle)

☐ **TickITPlus** (Integrated approach to software and IT development)

☐ **Other:** (Please specify in free text below)

SECURITY CLASSIFICATION OF THE WORK

The highest classification of this SOR

OFFICIAL ☐ OFFICIAL-SENSITIVE ☐ SECRET ☐ TOP SECRET ☐ STRAP ☐ SAP ☐

The highest expected classification of the work carried out by the contractor

OFFICIAL ☐ OFFICIAL-SENSITIVE ☐ SECRET ☐ TOP SECRET ☐ STRAP ☐ SAP ☐

The highest expected classification of Deliverables/Output

OFFICIAL ☐ OFFICIAL-SENSITIVE ☐ SECRET ☐ TOP SECRET ☐ STRAP ☐ SAP ☐

Is a Security Aspects Letter (SAL) required? *(A Security Aspects Letter (SAL) will be required for each Task above Official-Sensitive and above)*

Yes ☐ No ☐

TASK CYBER RISK ASSESSMENT. *(In accordance with DEF STAN 05-138 and the* Risk Assessment Workflow)

Cyber Risk Level	[REDACTED]
Risk Assessment Reference	[REDACTED]

ADDITIONAL TERMS AND CONDITIONS APPLICABLE TO THIS CONTRACT

Please ensure all completed forms are copied to DSTLSERAPIS@dstl.gov.uk when sending to the Lot Lead.

Tasking Form Part 2: *(To be completed by the Lot Lead)*

To: The Authority	From: The Lot Lead

Proposal Reference _____ **(attached)**

Delivery of the requirement:

The proposal shall include, but not be limited to:

- A full technical proposal that meets the individual activities that are detailed in Statement of Requirements (Part 1 to Tasking Form).
- Breakdown of individual Deliverables, with corresponding Intellectual Property rights applied.
- Breakdown of Interim Milestone Payments, with corresponding due dates.
- A work breakdown structure/project plan with key dates and deliverables identified.
- A list of required Government Furnished Assets from the Authority, including required delivery dates.
- A clear identification of Dependencies, Assumptions, Risks and Exclusions which underpin your Technical Proposal.
- Sub-Contractors Personnel Particulars Research Worker Form and security clearances (if applicable)

COMMERCIAL

[REDACTED]

[REDACTED]

[REDACTED]

PRICE BREAKDOWN

You are to use the costs detailed in Item 2 Table I in the Schedule of Requirement and at Annex E Table 2 of the Serapis Framework Agreement. Please also provide a price breakdown which should include, but is not limited to: Lot Lead Rates, Sub-contractors costs and rates, travel and subsistence. In support of your Proposal you are requested to provide clear details of all Dependencies, Assumptions, Risks and Exclusions that underpin your price.

Offer of Contract: *(to be completed and signed by the Contractor's Commercial or Contract Manager)*

Total Proposal Price in £	£151,446.57 for the core FY21/22 work Options - £714,658 for the Limit of Liability for years 2 and 3		(ex VAT)
Start Date:		**End Date:**	
Lot Leads Representative	Name	[REDACTED]	
	Tel	[REDACTED]	
	Email	[REDACTED]	
	Date	17th January 2022	
Position in Company	Assistant Commercial Manager		
Signature	[REDACTED]		

Core Work – Breakdown

[REDACTED]
[REDACTED]
[REDACTED]

Travel, Subsistence, Materials & Equipment *Please insert/delete rows as necessary*					
Supplier Name	**Spend Type**	**Description / Rationale**	**Unit Cost (£)**	**Qty**	**Total Cost (£)**
	Choose an item.				
	Choose an item.				
	Choose an item.				
				Total	

Core Work – Milestone breakdown costs

Proposed Milestones Payments

Your TMS bid costs shall be included in milestone 1.

The final Milestone must reflect the actual cost of the deliverable, and be greater than 20% of the Task value, unless otherwise agreed with your Commercial POC

Please duplicate the template per milestone table format below as necessary, and rename milestone number accordingly.

[REDACTED]
[REDACTED]

Future Tasks – Summary

[REDACTED]

Tasking Form Part 3:

To be completed by the Authority's Commercial Officer and copied to the Authority's Project Manager.

1. **Acceptance of Contract:**		
Authority's Commercial Officer	Name	[REDACTED]
	Tel	[REDACTED]
	Email	[REDACTED]
	Date	18/01/2022
Requisition Number		R1000167848
Contractor's Proposal Number		Serapis Task AII79: Generation after next (GAN) communications-environment modelling and forecasting tools
Purchase Order Number		DSTL0000000826
Signature		[REDACTED]
Please Note: Task authorisation to be issued by the Authority's Commercial Officer or Contract Manager. Any work carried out prior to authorisation is at the Contractor's own risk.		