RCloud Tasking Form – Part B: Statement of Requirement (SoR)

Title of Requirement	Investigation, integration & demonstration of future remote EOD capability for Redacted under FOIA Section 26 – Defence robot
Requisition No.	**RQ00000013690**
SoR Version	**0.1**

1.	**Statement of Requirements**
1.1	**Summary and Background Information**
	These investigation(s) seek to enable Dstl and the User community to understand and explore applicable mature and emerging robotic and semi-autonomous/autonomous technology applicable to Redacted under FOIA Section 26 – Defence robotic capability. Redacted under FOIA Section 26 – Defence forms part of the UK's Redacted under FOIA Section 26 – Defence capability and is designed and produced by Redacted under FOIA Section 26 – Defence. Its design includes the ability to support advanced teleoperation (human in the loop) capabilities for EOD missions. The system has the operator controlling most behaviours, including automation of basic functionalities such as manipulator arm pre-sets, pan, tilt and zoom (PTZ) camera tracking and the manipulator arm's collision avoidance with itself and the platform. Redacted under FOIA Section 26 – Defence Advances in autonomy technologies have made it possible for robotic systems such as T7 to perform a number of tasks using advanced robotic capability for either semi-autonomously or fully-autonomously. Semi-autonomous and autonomous behaviours such as Redacted under FOIA Section 26 – Defence have the potential to reduce operator workload, improve efficiency and task success rates. Future EOD autonomous capability is not fully defined but likely to be an Redacted under FOIA Section 26 – Defence capability with Redacted under FOIA Section 26 – Defence use where required. Redacted under FOIA Section 26 – Defence
1.2	**Requirement**
	Task 1 (T1) – Redacted under FOIA Section 26 – Defence Autonomy Integration Investigation **Task Objectives**: a. To identify current, mature and future, emerging Redacted under FOIA Section 26 – Defence robotic, tele-operated, semi-autonomous (on-demand) and autonomous remote capabilities (SW and/or HW) that are suitable for integration as payloads onto Redacted under

	FOIA Section 26 – Defence Payloads could include but not limited to, Redacted under FOIA Section 26 – Defence. b. To identify and confirm that the Redacted under FOIA Section 26 – Defence (SW/HW) is capable of supporting the capabilities identified in the above objective. If the infrastructure is not able to support the capabilities identified in serial 1, what measures are required to achieve this? c. To identify and confirm whether it is beneficial for Redacted under FOIA Section 26 – Defence to adopt the following; Redacted under FOIA Section 26 – Defence open architecture and interfaces, multi-robot operating control unit Redacted under FOIA Section 26 – Defence and the robot operating system Redacted under FOIA Section 26 – Defence in support of implementing future autonomous capability currently under development by Redacted under FOIA Section 26 – Defence. d. To identify tele-operated, semi-autonomous and autonomous payload control methodologies applicable to Redacted under FOIA Section 26 – Defence including but not limited to operation via the OCU and or applique tablet. e. To support creation of Redacted under FOIA Section 26 – Defence options for applying identified tele-operated, semi-autonomous and autonomous capability as 'proof of concept demonstrator(s)' to Redacted under FOIA Section 26 – Defence covering the following periods; UK FY22/23, UK FY 23/24. **Task Output (Deliverables):** The study should investigate the following: 1. Current and future state of the art in autonomy for Redacted under FOIA Section 26 – Defence missions, with an emphasis on 'appliqué' autonomy for integration as payloads to Redacted under FOIA Section 26 – Defence and similar traditional robot systems. Application of autonomous capability should cover in the first instance (current) the period 1-2 years and the second instance (future) 3-5 years. 2. Required changes to Redacted under FOIA Section 26 – Defence to allow the addition of third-party autonomy payload(s) (SW/HW). Changes could include but not limited to current architecture and the adoption of the Redacted under FOIA Section 26 – Defence 3. Recommended methods for control between the human machine interface (HMI) and tele-operated, semi-autonomous and autonomous payload(s). 4. Monthly quad chart status reports and final report. **Task 2 (T2) – Create Initial Demonstration System of a Redacted under FOIA Section 26 – Defence**

Task Objectives:

a. To investigate the benefits of a Redacted under FOIA Section 26 – Defence payload mounted at the wrist interface of a Redacted under FOIA Section 26 – Defence. The goal for this first phase of development is to create a functionally representative demonstration system (a.k.a. the “Concept 1” system).
b. Work with partner Redacted under FOIA Section 26 – Defence.
c. Redacted under FOIA Section 26 – Defence. Specific characteristics of the arms (number of DOFs, dimensions, joint torques, etc.) will depend on available, on-hand equipment. No physical modifications planned for this phase of the project.
d. Work with Redacted under FOIA Section 26 – Defence to modify (as required) software settings that affect power draw, data consumption, and IP network addresses to enable integration of Redacted under FOIA Section 26 – Defence system.
e. Design, develop and manufacture custom wrist adapter to allow mounting of Redacted under FOIA Section 26 – Defence and to include electrical loopback connection that will be read by Redacted under FOIA Section 26 – Defence
f. Design, develop and manufacture electrical cabling/connections necessary to provide power and Ethernet connectivity to the Redacted under FOIA Section 26 – Defence. The intent is for the Redacted under FOIA Section 26 – Defence.

Task Output (Deliverables):

1. Final report and demonstration of Redacted under FOIA Section 26 – Defence
2. Demonstration to be held at Redacted under FOIA Section 26 – Defence either in person or virtually.
3. Monthly quad-chart status reports, final report and video of demonstration system.

Task 3 (T3) – Create Initial Demonstration System of a Redacted under FOIA Section 26 – Defence

Task Objective(s):

To investigate the benefits of a Redacted under FOIA Section 26 – Defence. The goal for this first phase of development is to create a functionally representative demonstration system.

a. Procure required COTS equipment (radio, batteries, camera) for qty 1 DSN prototype.

b. Manufacture any required custom HW (e.g. brackets, cables) for DSN prototype

c. Integrate COTS equipment with custom HW to create prototype DSN, including any required modification to COTS equipment and include changes to Redacted under FOIA Section 26 – Defence.

Task Output(s) (Deliverables):

	1. Final report and demonstration of Redacted under FOIA Section 26 – Defence, demonstration to be held at Redacted under FOIA Section 26 – Defence either in person or virtually. Monthly quad-chart status reports and final report and video of demonstration system
1.3	**Options or follow on work** *(if none, write 'Not applicable')*
	Yes. **Task 1 (T1) – Redacted under FOIA Section 26 – Defence Autonomy Integration Investigation** 'Redacted under FOIA Section 26 – Defence options for applying identified tele-operated, semi-autonomous and autonomous capability as 'proof of concept demonstrator(s)' to Redacted under FOIA Section 26 – Defence covering the following periods; UK FY22/23, UK FY 23/24. **Task 2 (T2) – Create Advanced Demonstration System of a Redacted under FOIA Section 26 – Defence** **Task Objective:** a. To advance the Redacted under FOIA Section 26 – Defence concept by addressing the technical gaps identified in Task 1. These technical gaps require addressing in order to enable the Redacted under FOIA Section 26 – Defence. This task includes multiple possible sub-tasks (identified below). b. Integrate Command and Control of Redacted under FOIA Section 26 – Defence c. Modify Redacted under FOIA Section 26 – Defence (i.e. eliminate the need for a secondary controller) to enable the ability to control all aspects of the Redacted under FOIA Section 26 – Defence. (Scope of this effort expected to include "basic teleoperation). d. Coordinated Command and Control of Redacted under FOIA Section 26 – Defence (Concept 2) with additional functionality to include: Collision avoidance between Redacted under FOIA Section 26 – Defence. e. Modification of Redacted under FOIA Section 26 – Defence Interfaces (Concept 3) to include the modification of the Redacted under FOIA Section 26 – Defence to simplify electromechanical interfaces required for installing/removing the Redacted under FOIA Section 26 – Defence. f. Investigate camera solutions for this configuration to include relocation of elbow camera to "head" of Redacted under FOIA Section 26 – Defence g. Investigate modification / reconfiguration of the Redacted under FOIA Section 26 – Defence, based on: Required manipulation capabilities (strength, reach, dexterity) and space constraints on Redacted under FOIA Section 26 – Defence

	Task Output(s) (Deliverables) Deliverables for each subtask of Task 2 are TBD and will be determined based on the scope of execution for each subtask. **Task 3 (T3) – Create Advanced Demonstration System of a DSN Payload for the Redacted under FOIA Section 26 – Defence** **Task Objective:** a. To advance the DSN payload concept by addressing any technical gaps identified in Task 1. This includes possible redesign or optimization of the DSN payload power electronics Redacted under FOIA Section 26 – Defence as well as redesigning mechanical enclosures to allow the repeater to be compact enough to be mounted on the Redacted under FOIA Section 26 – Defence prior to use. b. The intent is for Task 2 to result in a prototype that is representative of a field-able/end-item DSN payload. Additionally, this redesign may include some standardization of the camera interface to support broad functionality of supporting a wider variety of deployed sensors (see description in Appendix). c. Redesign of DSN to suit deployment from Redacted under FOIA Section 26 – Defence d. Modify the DSN power system, electronics, cabling, and mechanical packaging to reduce the volume of the DSN (necessary for repeater-style deployment) and enable the DSN to be powered from standard Redacted under FOIA Section 26 – Defence batteries. e. Modify DSN interfaces to support its use as a “generic sensor node”. Redesign interface between sensor Redacted under FOIA Section 26 – Defence and sensor node electronics to enable removal of the camera and replacement with other sensors. Interface is expected to match the Redacted under FOIA Section 26 – Defence to enable flexibility of sensor mounting between the sensor node or the robot. f. Modify Redacted under FOIA Section 26 – Defence (as needed) to enable ingesting and displaying multiple types of sensor data, depending on which sensor is connected to the sensor node. **Task Output(s) (Deliverables)** Deliverables for each subtask of Task 2 are TBD and will be determined based on the scope of execution for each subtask.
1.4	**Contract Management Activities**

1.5	**Health & Safety, Environmental, Social, Ethical, Regulatory or Legislative aspects of the requirement**
	As Terms and Conditions

1.6	Deliverables & Intellectual Property Rights (IPR)					
Ref.	**Title**	**Due by**	**Format**	**Expected classification (subject to change)**	**What information is required in the deliverable**	**IPR Condition**
D – 1 Task 1	Monthly Progress and Technical Report as per Dstl Quad chart format.	T0+1 Month & each month until completion.	Presentation (.pptx)	Redacted under FOIA Section 43 – Commercial Interest	Presentation pack to include but not limited to: • Update on technical progress • Progress report against project schedule. • Review of risk management plan. • Review of deliverables. • Risks/issues.	DEFCON 705 – as RCloud Terms and Conditions
D – 2 Task 1	Final Report	T0+<8 Months	Presentation (.pptx)	Redacted under FOIA Section 43 – Commercial Interest	Final Report, covering findings & recommendations for next steps/roadmap for Redacted under FOIA Section 26 – Defence.	DEFCON 705 – as RCloud Terms and Conditions
D – 3 Task 2	Monthly Progress and Technical Report as per Dstl Quad chart format.	T0+1 Month & each month until completion.	Presentation (.pptx)	Redacted under FOIA Section 43 – Commercial Interest	Presentation pack to include but not limited to: • Update on technical progress • Progress report against project schedule. • Review of risk management plan. • Review of deliverables. • Risks/issues.	DEFCON 705 – as RCloud Terms and Conditions

D – 4 Task 2	Final Report & demonstration	T0+<8 Months	Presentation (.pptx) & demonstration	Redacted under FOIA Section 43 – Commercial Interest	Final Report and demonstration of DAMS payload on T7 system. Demonstration to be held at L3Harris facility in Palm Bay, FL, USA either in person or virtually.	DEFCON 705 – as RCloud Terms and Conditions
D – 5 Task 3	Monthly Progress and Technical Report as per Dstl Quad chart format.	T0+1 Month & each month until completion.	Presentation (.pptx)	Redacted under FOIA Section 43 – Commercial Interest	Presentation pack to include but not limited to: • Update on technical progress • Progress report against project schedule. • Review of risk management plan. • Review of deliverables. • Risks/issues.	DEFCON 705 – as RCloud Terms and Conditions
D – 6 Task 3	Final Report & Demonstration	T0+<8 Months	Presentation (.pptx) & demonstration	Redacted under FOIA Section 43 – Commercial Interest	Final Report and demonstration of DSN payload on Redacted under FOIA Section 26 – Defence. Demonstration to be held at Redacted under FOIA Section 26 – Defence either in person or virtually.	DEFCON 705 – as RCloud Terms and Conditions

1.7	**Deliverable Acceptance Criteria**
	As per Framework Ts&Cs. Demonstration to be held at Redacted under FOIA Section 26 – Defence either in person or virtually via MS Teams or similar.

2	**Evaluation Criteria**
2.1	Method Explanation
	As the requirement is being offered on a non-competitive bases, the proposal shall be subjected to an informal review, and where required feedback shall be issued to the supplier.
2.2	Technical Evaluation Criteria
	The technical team shall assess how well the proposal demonstrates the ability to meet the Statement of Requirement, and task objectives. Technical proposal should thoroughly show how the supplier intends on meeting the criteria, including timeframes and milestones.
2.3	Commercial Evaluation Criteria
	The commercial evaluation shall consists of the following Pass / Fail questions: 1. Has the proposal been submitted a firm price, using the accepted RCloud rate card for non-competitive tasks? 2. The proposal is fully compliant, and accepts, the RCloud v4 terms in full 3. The proposal has included a Supplier Assurance Questionnaire (SAQ) in response to the specified Cyber Risk Assessment detailed in RCloud Document Part A, and the response has included the DCPP correspondence. 4. The supplier has submitted One (1) Full Technical proposal excluding all commercial and price details, and has submitted One (1) Full Commercial and Technical proposal including all price data.