

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

Title of Requirement	Robotic Chemist Specification
Requisition No.	1000163414
SoR Version	0.1

1.	Statement of Requirements
1.1	Summary and Background Information
	Dstl delivers chemical, biological and explosives analytical services critical for defence and security. These range from low Technology Readiness Level (TRL) generation-after-next S&T through applied experimentation to direct operational support. Such services are delivered by a comparatively small number of specialised staff, trained to operate within highly regulated, highly secure, bespoke laboratories. Scaling the capacity to surge rapidly to meet peak operational demand whilst still delivering optimal cost effectiveness is a constant challenge. One innovative potential solution to this issue is the introduction of 'robotic chemists', able to work seamlessly alongside their human counterparts on demand, undertaking either routine operations or those for which a robot is better suited. In essence, replacing the human in delivery of as much of the end-to-end process as possible, ideally fully autonomously. A 2 year project has been instigated to investigate implementation barriers and to demonstrate the suitability and benefits of this solution, enabling the delivery of Dstl's chemical analytical services more efficiently, effectively and flexibly. It could also pave the way for the adoption of such technology on behalf of the whole of the UK's defence and security enterprise, de-risking wider implementation and starting to build skills and experience of operating such systems across UK government. Dstl requires assistance in delivering this project from organisations with experience and a proven track record in the application of such robotic systems in a chemical laboratory environment. That track record should enable the successful bidder to advise and assist Dstl with the identification, specification and selection of the optimal system to procure. Follow on work could lead to further assistance in procurement, programming and testing of such solutions as well as training Dstl staff and providing initial technical support for the duration of the project.
1.2	Requirement
	Dstl has identified two chemistry related processes through which to demonstrate the benefits and explore the challenges of implementing such technologies within its laboratories. These processes are described and illustrated in the accompanying videos files, which are available upon request. Applications are sought from organisations to advise on the optimal robotic systems to procure in order to undertake these processes. The proposed solution is expected to be based on a commercial-off-the-shelf robotic solution(s) with minimal adaptation. The systems proposed should ideally have already been proven to operate effectively in a chemistry laboratory, be programmable, capable of being remotely controlled, mobile, capable of autonomous operation and offer the potential to be programmed to learn and adapt themselves. As ultimately the systems will be expected to perform as wide a range of chemistry related processes as possible, the systems proposed should ideally be modular, adaptable and upgradable.

The contract deliverable should be a report which describes, as a minimum:

- The bidder's track record, expertise and experience in the field, as demonstrated, for example, by relevant peer reviewed scientific journal publications.
- The approach they would take to meeting the requirement – e.g. exclusively on prior knowledge and experience, through experimentation with candidate systems they possess under this contract, or a combination of both.
- A detailed analysis of both processes, to provide an assessment of how each may be achieved by robotic systems, the technical challenge and risk associated, and an indication of typical precision, reliability and repeatability with which each stage may be completed. The analysis may be made through the application of the bidder's experience and track record in previous work, or through experimentation of the processes defined within this contracted with a suitable robotic system they have access to or a combination of the two.
- Recommendations on changes to the process to make them more amenable for completion by a robot, if applicable.
- Recommendations of optimal candidate commercial robotic systems to procure, with typical associated costs, procurement timescales and risks, drawing on the assessment above. The OEM and country of manufacture must be specified, along with the origin of as many of the key sub-system components as possible. If more than one system is recommended, the advantages and disadvantages of each should be specified. A description of the experience that the bidder has with the systems recommended (if not the manufacturer) should be provided.
- An indication of whether such systems can be hired or must be purchased outright at the outset.
- An indication of whether the bidder already has access to systems it has recommended and if so, whether they would be willing and able to undertake potential follow on work using these systems.
- An indication of the likely adaption and programming necessary for the recommended candidate system(s) to undertake the processes defined, with indicative risk and complexity. An indication as to whether the system is controlled exclusively through proprietary software or open source software and architecture should also be provided.
- A detailed description of the mode(s) of operation of the recommended solution(s) – e.g. wireless or tethered - and an assessment of the suitability of the systems to operate within the safety and legislative frameworks which govern Dstl's laboratories, as outlined below.
- Typical flexibility and adaptability of the recommended solutions.
- A description of the willingness, suitability, approach and benefits of the bidder in supporting Dstl in follow on work: namely procurement, programming, test and evaluation, training and technical support within the duration of the two year project.

If the successful bidder is not themselves a manufacturer of robotic systems, it is expected that they can demonstrate close, beneficial association with such.

The bidder must specify in their response the timescale in which they will deliver the contract output and the cost. Dstl requires the report to be delivered no later than 60 days from contract placement.

Bidders should note that due to the location and sensitivity of the environment (facility and facility capability) associated with this task, a UK National Only restriction will be applied to proposed research workers, and Dstl will require approval from our Third party Assurance team following submission of a completed Research Workers Form, or confirmation of security clearance details.

	Dstl envisage that the initial work identified under deliverables RC-D1 to RD-D3 shall be delivered by September 2021. If an option for follow on work is exercised this will be run until March-2023. In consideration of this position the following funding profile has been identified: Financial Year 2021/22: £250,000 has been allocated, of which a budget of £20,000 is available against Phase 1 (Deliverables RC-D1 to RC-D3 inclusive). Which results in one system recommendation upon the completion of Phase 1. If the Authority exerts the Option for follow on work (Phase 2) outlined in section 1.3. a budget of £220,000 is available within Financial Year 2021/22, and a further budget of £75,000 is available in Financial Year 2022/23.
1.3	Options or follow on work <i>(if none, write 'Not applicable')</i>
	The output from this contract is expected to lead to the procurement of one or more the robotic systems recommended. There is the potential for the successful bidder to undertake or assist Dstl with the procurement of the system, its programming, test and evaluation to demonstrate its ability to perform the processes defined, training of Dstl staff in its operation and technical support, within their own facilities or at Dstl's, for the duration of the project. As specified above, Dstl would welcome an indication of the ability, and benefits to Dstl of the bidder assisting Dstl with these task through subsequent contracts in the bidder's response, .
1.4	Contract Management Activities
	No specific contract management activities are identified for the initial requirement.
1.5	Health & Safety, Environmental, Social, Ethical, Regulatory or Legislative aspects of the requirement
	Ultimately, the robots procured by Dstl must operate within Dstl's laboratory facilities. These are facilities in which REDACTED MILITARY SENSITIVE INFORMATION, in addition to normal hazardous chemicals. From an REDACTED MILITARY SENSITIVE INFORMATION perspective, these facilities are operated in accordance with the relevant sections of REDACTED MILITARY SENSITIVE INFORMATION. Similar regulations apply to the facilities in which toxic chemicals are analysed. In addition, some forensic processes are conducted within the scope of ISO 17025 accreditation, the Forensic Regulators Code of Practice and within clean room facilities in which trace/cross contamination is strictly controlled and monitored. Alongside compliance with various security regulations, collectively these represent a highly regulated environment in which the robotic systems must operate. REDACTED MILITARY SENSITIVE INFORMATION. Whilst it is not expected that the bidder will have a comprehensive understanding of all of the regulations that are applicable, nevertheless the bidder should provide evidence that this end User environment has been considered in the recommendations which are made. Evidence of the suitability of the systems recommended in comparable environments should be provided wherever possible

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
RC-D1	Monthly Progress and Technical Review (QPTR 1)	T0 +1 Month	Presentation (.pptx), Hosted through MS Teams or In Person	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	Default RCloud Agreement Terms and Conditions shall apply Full Rights Version
RC-D2	Specification of Robot Chemist	T0 +2 Months	MS Word documents (.doc)	OFFICIAL	Deliverable RC-D2 Shall include but not be limited to: • Specification for the Robot Platform, • Evidence and analysis of system and specification down selection.	Default RCloud Agreement Terms and Conditions shall apply Full Rights Version
RC-D3	Proposal for development of the Robot Chemist	T0 +3 Months	MS Word documents (.doc)	OFFICIAL	Detailed analysis of how the contractor would meet the specification.	Default RCloud Agreement Terms and Conditions shall apply Full Rights Version

1.7	Deliverable Acceptance Criteria
	- Track record and experience of the bidder in the application of robotic systems to chemical processes in a laboratory environment, demonstrated ideally, for example, through relevant peer reviewed scientific journal publications. - The application of this experience in providing detailed analysis of the ability of a robotic system to undertake the processes defined, as outlined in section 1.2. - A detailed recommendation of the optimal robotic systems to procure, specifying costs, timescales, risks, challenges and benefits, as outlined in section 1.2. - The ability and benefits to Dstl of the bidder to work with Dstl on subsequent tasks within the project, as outlined in section 1.3. The supplier shall be responsible for the delivery of all deliverables to Dstl Porton Down. If any equipment is delivered under this task the supplier shall be responsible for packaging requirements noting that Dstl will retain the packaging, in case of potential return to supplier, and all packaging must not be single-use.

2	Evaluation Criteria
2.1	Method Explanation
	The evaluations shall be conducted using a Value for Money (VfM) Index which sets out to divide the awarded technical score by the price. The maximum technical score available is 80 Points. Dstl will consider awarding a task to two (2) bidders.
2.2	Technical Evaluation Criteria
	- The supplier has demonstrated their track record and experience in the application of robotic systems to replace humans in completing processes in a laboratory environment? Examples of experience should be limited to examples no older than 5-Years. Evidence which cannot demonstrate achievement via relevant peer reviewed scientific journal publications, or which are older than 5-Years will be limited to a maximum score of 3 Points (Acceptable). Examples and evidence can include scientific journal publications, professional body membership, technical working groups participation, invited technical presenter experience) that the institute has a proven research experience within the fields of robotics, autonomous systems, artificial intelligence, software programming and computer coding. - The supplier demonstrates a comprehensive understanding of the risks and challenges of using robotic systems to perform the processes defined in the requirement. As part of this question the evaluation will give consideration to the submission to project risk registers to further understand the suppliers understanding of the potential risks and challenges. - The supplier provides evidence that the safety, forensic and quality regulated end user environment has been considered in the proposal recommendations made. - The supplier has demonstrated their experience and ability to work in a collaborative and agile manner, and has identified how these behaviours can be applied to this requirement.

	5. The supplier has presented a clear and unambiguous project plan detailing the construction, assessment and application of the 'Robotic Chemist' strategy, how the work will be resourced and the implementation of laboratory robotics. The plan demonstrates a comprehensive understanding of the risks and challenges of using a robotic system and application towards a scientific laboratory environment. 6. Further, the plan provides a high level overview for the follow on Work (Build) outlining key milestones, dependencies, and enablers Please note that Question 1 and 5 will have a weighting factor of 2 applied, and will be subject to a minim technical compliance score of 7 – Good. Any proposal which score less than this value will be classified as technically non-compliant. The Technical Evaluation will assess the question using the following scoring range: 10 – Excellent: The response addresses all elements of the requirement, and provides a comprehensive, unambiguous and thorough explanation of how the requirement will be fulfilled 7 – Good: The response addresses all of the elements of the requirement and provides sufficient detail and explanation of how the requirement will be fulfilled. 3 – Adequate: The response addresses the majority of elements of the requirement but is weak in some areas and does not fully detail or explain how the requirement will be fulfilled. 0 – Inadequate: The response does not address or explain how the requirement will be fulfilled and fails to demonstrate the ability to meet the requirement.
2.3	Commercial Evaluation Criteria
	The commercial evaluation shall be based on the following Pass / Fail questions: 1. Has the bidder submitted one (1) full proposal (Technical and Commercial) including all price detail, and has the bidder submitted one (1) Full Technical proposal which excludes all commercial price information? 2. Has the bidder submitted the proposal as a Firm price? 3. Has the bidder submitted one (1) completed copy of RCloud Form Part C – Task Response Form? 4. Has the bidder provided a Supplier Assurance Questionnaire (SAQ) in response to the Cyber Risk Assessment? A fail on any of the above questions will result in your proposal being excluded from further evaluation and consideration.