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Statement of Requirement for the R-Cloud Chemical, Biological (CB) Advice Strategic Capability

Introduction:

The Defence Science and Technology Laboratory (Dstl), which is part of the UK Ministry of Defence (MOD), is refreshing its commercial agreement for Science and Technology (S&T) research contracts, known as R-Cloud (Research Cloud).

MOD places extensive fundamental, experimental and applied research with industry and academic suppliers and wants to broaden access for this supply base, reducing the cost of trading with MOD and enabling agile contracting. R-Cloud complements MOD's other contracting mechanisms and academic and industry suppliers of S&T research are now invited to apply to join MOD's research supplier community within the CB Advice Strategic Capability.

This statement of requirement relates to suppliers joining R-Cloud within the CB Advice capability area. R-Cloud provides a low barrier to entry for potential suppliers and offers direct access to MOD's current and future research requirements. Academic and industrial suppliers of CB Advice research are invited to apply to R-Cloud if you are a supplier of Science and Technology Research in this area.

The UK is fully committed to its obligations under the Biological and Toxin Weapons Convention and the Chemical Weapons Convention. All MOD sponsored work must be in the context of the prophylactic, protective or other peaceful purposes that are not prohibited under the terms of these Conventions.

Proposals using animals must be fully compliant with national legislation and institutions may be audited to ensure work is conducted to a suitable standard prior to a contractual commitment and whilst under contract.

CB Advice encompasses a range of technical areas, these are summarised here:

Mathematical modelling of chemical and biological hazards

Understanding and exploiting modern tools and techniques to provide specialist advice, supporting situations ranging from operational decision making to supporting procurement for defence equipment. The models may be empirically based or based on first principles. The types of models will likely include but are not limited to models which:

- Predict the dispersion of chemical and biological agents indoors and outdoors,
- Predict the environmental persistence of and hazard associated with chemical and biological agents,



- Predict the performance of detection systems for chemical and biological agents,
- predict the utility of protective equipment, e.g. respirators and protective suits, for chemical and biological agents,
- Predict the physiological effects of CBR agents on people,
- predict the management and operational consequences of chemical and biological agents,
- Predict the effects of intervention decisions in the event of a disease outbreak,
- Include optimisation algorithms related to CBR modelling and simulation tools.

Research may also be required to support the development and validation of these models.

Operational analysis

Research and analysis may be required to support the understanding of the impact that chemical or biological substances may have on the UK or its deployed armed forces, or to support understanding of the UK's opportunities to prevent the proliferation and use of such substances. Research and analysis may be required in a number of areas including, but not limited to:

- soft systems methods and other qualitative techniques,
- methods for assessing and understanding the risk from CBR incidents,
- methods for conducting balance of investment and cost-effectiveness assessments of potential mitigation measures,
- methods for assessing the effectiveness of options to prevent an adversary developing the ability to use chemical or biological substances against UK interests.

International biological threat reduction and counter-proliferation

Technical research may be required to support activities to strengthen global biological security. These may link UK experts with scientists and networks in several priority regions including the Caucasus, Central Asia, the Middle East/North Africa and Afghanistan, to promote best practice in biosecurity and biosafety in a sustainable way.

Decision support

CBRN Knowledge Management (KM) understand the requirements of decision makers when faced with the threat of, or actual CBR hazards. Decision support provides the user with an enhanced ability to generate and manage knowledge of CBR threats and hazards to minimise their impact and enable decision makers to continue to deliver the required effects. This requires development of improved tools to undertake decision support and knowledge management.



Risks and opportunities of emerging technology in the context of CB Defence

Horizon Scanning of the technology landscape in order to determine which emerging technologies, ideas and concepts present current and future opportunities and risks to CB Defence and Security. Assess and research identified technologies, concepts and ideas to understand potential impact of technology with respect to CB Defence.

Data science and statistics

Data science and statistical advice and support to Chemical and Biological research. Work may be required to:

- Provide advice and expertise on experimental design,
- Use data science tools and techniques to provide high quality, high impact analysis and advice to customers,
- Improve analysis of CB research and improve management of data.