

# News story: Maximising Human Performance – Market Exploration

The Defence and Security Accelerator (DASA) and the Defence Science and Technology Laboratory (Dstl) are scoping the potential for an innovation challenge in maximising human performance, for the Ministry of Defence's Future Workforce and Human Performance Programme. To aid in the design of the potential challenge we are undertaking market engagement to provide us with an understanding of capabilities that currently exist or innovative ideas which could potentially address this challenge. This request for information is not a commitment to subsequently launch a formal DASA competition.

## **Background**

Dstl is seeking to research and develop new and innovative techniques to safely enhance performance of human operators. This research will investigate factors which limit or degrade the effectiveness of the operator, whilst delivering evidence-based guidance to sustain, enhance or augment their physical and/or cognitive performance at times of operational imperative. These techniques will be exploited directly in support of the UK's defence and security operations maximising the effectiveness of UK Government's investment in its personnel.

## **Challenge Areas**

Solutions will support personnel during training and operations, in preparation for rapid reaction response or for deployment on long duration, complex operations to a variety of different challenging environments. There are five challenge areas where we're looking for innovative capabilities to sustain, enhance or augment cognitive and/or physical performance:

1. Novel methods and interventions to optimise performance of people undertaking prolonged complex work (work that involves sustaining performance over long periods of time, weeks/months and possible cumulative effects). Work under this challenge could include, but is not limited to, research into the following areas: optimising sleep quality through the use of novel techniques/technologies, investigating new methods of improving performance when operating under sleep disrupted conditions, looking at novel approaches to maintaining alertness/countering fatigue, improving the quality of rest, enhancing speed of recovery/regeneration and enabling relaxation during any 'down' time. We are not looking for advice on sleep hygiene or how to manage jet lag; we want to see truly novel investigations into new techniques, tools, technologies and approaches in this area.
2. The role of nutrition for enhancing performance. Work under this

challenge could include, but is not limited to, research into the following areas: novel nutritional supplementation as an ergogenic aid – investigating novel supplements which might enhance physical and/or cognitive performance during long duration training and operations. Submissions should be based on a sound scientific understanding of the basis of the potential effects (for example, understanding of the metabolism or neuroscience) and the ability to scientifically investigate any nutritional intervention.

3. Novel strategies to sustain or improve performance of complex cognitive tasks and ways to mitigate potential overload (investigating factors that can impact on performance of a complex cognitive task during a single 'shift'). Work under this challenge could include, but is not limited to, research into the following areas: investigating training methods that help personnel manage multiple diverse sources of information and assist decision-making, methods, tools or techniques to manage physical and cognitive fatigue that results from time on task, and maintain/improve performance during long shifts. We would also like to see ideas for research which aims to advance our ability to identify times when personnel are likely to become cognitively 'overloaded'. For example, research in this area might look at ways to measure cognitive 'load', improving our understanding of the links between cognitive performance, cognitive fatigue and workload and methods of measuring all of the above without interrupting a task.
4. Novel techniques to enhance human cognitive performance. Novel interventions for improving cognitive performance are in development, however, these interventions often lack the evidence base to be able to support their use, or they have an existing evidence base which doesn't go far enough from the point of view of defence and security. For example, a training intervention may have good evidence that it improves performance in a well-structured scenario, such as a set piece in sport, however, the evidence base doesn't exist to demonstrate that the intervention will translate into an improvement in performance in a complex operational situation, or that it could be widely applied to a broad spectrum of users with differing cognitive abilities. Work under this challenge should aim to address these types of issues and develop the evidence base needed to either support (or dismiss) existing and novel interventions.
5. Novel ways to optimise training and enhance readiness for deployment. Work under this challenge could include, but is not limited to, research into the following areas: the use of novel ergogenic aids, ways to make novel methods of training more accessible to defence and security trainers. The aim is to enhance cognitive and physical readiness to deploy and maintain performance on deployment.

Any future challenge end goal is to ensure the Ministry of Defence has the

most powerful capabilities available to enhance the physical and cognitive performance of personnel. The aim is to provide a toolkit of techniques, demonstrated to be effective, to apply during complex training and operations, leading to improved overall system performance and mitigation of information and physical overload.

## **What we want**

We are interested in innovative capabilities and ideas that aim to address one or more of the five challenge areas, at any level of maturity. Submissions should be provided by teams with the experience and knowledge necessary to establish sound scientific evidence for any potential technology or intervention.

By completing the Capability Submission Form neither the Government nor yourselves are committing to anything, but your submissions will be used to help the Government focus the direction of the work and shape the requirements for a possible themed call in this area in the future.

## **What we don't want**

We are not interested in receiving ideas for literature reviews, plans for paper-based studies or marginal improvements to existing capabilities. This is not a competition and therefore we are not asking for costed proposals at this stage. This is a market engagement request for information exercise and we do not commit to subsequently launch a formal DASA competition.

## **How to submit a Capability Submission Form**

Complete the attached one page form (noting the word limits) and then email it to [accelerator@dstl.gov.uk](mailto:accelerator@dstl.gov.uk) by 16 November 2018 with Maximising Human Performance in the subject line.

Please only provide details of one product/capability per form. If you have a number of potential solutions then please submit multiple forms.

If you have any questions then please email [accelerator@dstl.gov.uk](mailto:accelerator@dstl.gov.uk) with Maximising Human Performance in the subject line.

## **How we use your Information**

Information you provide to us in a Capability Submission Form, that is not already available to us from other sources, will be handled in-confidence. By submitting a Capability Submission Form you are giving us permission to keep and use the information for our internal purposes, and to provide the information onwards, in-confidence, within UK Government. The Defence and Security Accelerator will not use or disclose the information for any other purpose, without first requesting permission to do so.