News story: Market Exploration: Innovation in Aircrew Protection

Background

Dstl is seeking to research and develop new and innovative designs to safely enhance the protection and performance of military aircrew. To help design the potential challenge we are undertaking market engagement to provide us with an understanding of innovative ideas or capabilities that currently exist in other areas of personnel protection which could potentially address this challenge. This research will investigate technologies or approaches which can be used to improve effectiveness of the human 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 used in support of the UK's defence and security operations as part of the UK Government's investment in its personnel.

Please note that this request for information is not a commitment to subsequently launch a formal DASA competition.

Challenge Areas

Potential solutions will support personnel during training and operations, in preparation for rapid reaction response or for deployment on long, complex operations to a variety of different challenging environments. We are seeking innovative capabilities to protect personnel operating in a hostile flight and ground environment and use aircrew equipment assemblies (AEA) which includes aircrew helmets, glasses, flying coveralls, immersion suits, anti-g suits, lifejackets, body armour, boots, gloves, protective undergarments and oxygen masks, oxygen supplies, rehydration and urination systems, survival equipment, first aid, ration packs, radios, beacons, torches, flares.. This is in order to best sustain, enhance or augment aircrew cognitive and/or physical performance. There are three specific challenge areas that look to ensure crew in next generation fighter jet aircraft are protected, but we want solutions that can be used across all military air platforms:

1. Protection from cockpit and external environment, and optimising aircrew performance. This should involve modifications to the crew's personal protection and not structural alterations to air platform. Work under this challenge could include, but is not limited to, research into the following areas: use of novel materials/techniques to provide protection from fire/windblast/cold/immersion with reduced material bulk and thermal burden, potential technologies to allow for aircrew urination during long-duration sorties (this should consider both male and female anatomy), investigating new methods of improving pilot systems performance by integrating physiological sensors to AEA, looking at novel approaches to maintaining alertness / countering fatigue,

improvements to oxygen mask and helmet comfort and protection and aircrew cooling systems. We are not looking for incremental improvements to current equipment standards; we want to see truly novel investigations into new techniques, tools, technologies and approaches in this area.

2. Improvement in life support systems. Work under this challenge could include, but is not limited to, research into the following areas: novel technologies to supply aircrew with primary and secondary supplies of conditioned and regulated breathing air, and means of improving g-protection and potential to alleviate the need for anti-g strain manoeuvres. Where possible, these technologies should be self-contained, or capable of being isolated from the wider air platform. Submissions should be based on a sound scientific understanding of aeromedical principles (for example, cognisant of the differing requirements of pressure breathing for altitude- and g-protection) and the ability to scientifically investigate any novel technological elements.

3. Innovations in aircraft emergency escape systems (in air and on ground). The current ability of aircrew to escape is constrained in terms of available technology. Work under this challenge is intended to stimulate a more innovative approach and could include, but is not limited to, research into the following areas: investigating novel techniques in assisted escape from aircraft, both on the ground and in the air and post-ejection survival equipment. This can include research and technologies targeted at understanding and reducing ejection-related injury.
   Any future challenge end goal is to ensure the Ministry of Defence has the most effective capabilities available to enhance the physical and cognitive performance of aircrew personnel. The aim of this Market Exploration is to provide an overview of potential technologies, to apply during complex training and operations, leading to improved overall system performance, comfort and protection for aircrew.

What we want

We are interested in innovative capabilities and ideas that aim to address one or more of the three challenge areas above, 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 / intervention. By completing the Capability Submission Form neither DASA, Dstl nor yourselves are committing to anything, but your submissions will be used to help DASA focus the direction of the work and shape the requirements for a possible themed call in this area in the future. Your submission will also help us to identify your interests in this area, and where appropriate we can introduce you to your regional DASA Innovation Partner to discuss any future activity.

What we do not 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 DASA Capability Submission Form – Innovation in Aircrew Protection (MS Word Document, 887KB) (noting the word limits) and then email it to accelerator@dstl.gov.uk by 26 June 2019 with Aircrew Protection 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 with Aircrew Protection 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.