Supporting Optimised Manning for Unmanned Vehicles

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Unmanned vehicles, and Unmanned Aerial Vehicles (UAV) in particular, are considered by many to offer great support to those professions that engage in 'dull, dirty or dangerous' missions. The use of unmanned vehicles stands to benefit the broad spectrum of society by conducting a range of activities in the air, on the ground and in the sea, from pipeline inspection and repair, to cell phone signal relay in remote areas, to search and rescue, to military intelligence, surveillance, reconnaissance and, latterly, combat functions.

One factor that has the potential to detract from these benefits is the need of Unmanned Vehicle Systems (UVS) for teams of personnel for control, launch, recovery, etc. To reduce the manning requirements, conventional thinking, and most research, is focusing on operator workload, situation awareness, training, interface and adaptive interface design, and function allocation. Military organisations are also drawing operators from a wide pool of personnel in order to overcome a perceived shortfall in people with suitable technological expertise.

One other approach to increasing available people resources is to create UVS that exhibit commonality for human interaction. A central group of personnel can then be formed and deployed on different UVS platforms as and when the need arises. Technical interoperability for UAVs is already being worked toward under the auspices of NATO STANAG 4586; human interoperability within and between UVS domains is a logical step toward improved UVS effectiveness.

It is unlikely that a UAV has the same control dynamics as an Unmanned Ground Vehicle (UGV), an Unmanned Surface Vehicle (USV) or an Unmanned Underwater Vehicle (UUV). The inertia exhibited by the vehicle and the action of the vehicle control surfaces on the medium through which it moves may represent incompatibilities that the operator has trouble overcoming. This could lead to sub-optimal mission performance or even damage to the UVS.

Different vehicles may also be predisposed toward the carriage of different payloads. For instance, a UUV may carry sonar equipment, while a UGV might carry a camera and a UAV might carry thermal imaging equipment. Each vehicle may need to be controlled in different ways to optimise the use of the payload. Likewise, the manner in which the payload is used may vary according to the vehicle platform.

The role of support teams must also be considered, since the support role often involves the most people. It may be possible for different vehicles to share common sets of components and/or tools, but it may be difficult for an individual to retain the knowledge and skill to support several different types of vehicles.

This paper explores the dimensions of the likely differences that will need to be overcome in order to support an effective, cross-trained pool of UVS operators that can be deployed quickly and confidently into any domain. The paper also discusses considerations that should be made when addressing these differences via hardware and software design, training, procedures, organisation or environment.

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