

---

## Foreword

---

### Stephen C. Cook

Defence and Systems Institute,  
DSTO Professor of Systems Engineering,  
University of South Australia,  
Adelaide, Mawson Lakes Campus SA 5095, Australia  
E-mail: Stephen.Cook@unisa.edu.au

**Biographical notes:** Professor Dr Stephen Cook is the Director of the Defence and Systems Institute at the University of South Australia. His career commenced with over ten years engineering experience in the telecommunications and aerospace industries after which he joined the Defence Science and Technology Organisation (DSTO) rising to Research Leader Military Information Networks. In 1997 he joined the university as the DSTO Professor of Systems Engineering and has led various defence research concentrations since. He is a Past President of the Systems Engineering Society of Australia and his research interests include systems modelling, defence capability engineering, and identifying the theoretical basis for systems engineering.

---

I was delighted to be asked to write the forward for the first issue of a new journal dedicated to archiving research progress in an important defence-related field of endeavour. An obvious question was why do we need a new journal? After a short conversation with one of the editors-in-chief I soon had my answer. Firstly, this journal is focussed squarely on the engineering aspects of creating and sustaining defence capabilities. While the definition of a defence capability varies somewhat across the World, the current one from the Australian Department of Defence will serve here: “the power to achieve a desired operational effect in a nominated environment, within a specified time, and to sustain that effect for a designated period”. Capability is generated by Fundamental Inputs to Capability comprising organisation, personnel, collective training, major systems, supplies, facilities, support, command and management.<sup>1</sup> The point to be made here is that defence capability comes into being when the primary military platforms we normally associate with defence are integrated with their sensing, weapons and communications systems and are able to be operated by trained users and supported in their intended environments. For the purposes of this journal the editors define support systems to be all those systems other than the platform itself. Such systems can be technical or social-technical in nature and the papers in this inaugural issue give, perhaps, the best indication of the range of topics that needs to be managed in the creation and sustainment of defence capabilities.

Increasingly, defence support systems are incorporating local intelligence both to provide the level of performance demanded in the modern world and to satisfy one of the most important design rules of systems that relates to partitioning. It is widely agreed that systems should be partitioned such that the subsystems display high internal coherence

and the interfaces between systems should be simple and easily characterised. This translates, for example, into the desire for the control interface for an autonomous vehicle to be defined in terms of high-level commands, for example: “determine if there are any personnel still in the building” to which a simple response would be expected. If this situation is to be achieved, system components need to be able to interpret abstract instructions and to possess sophisticated reasoning capabilities.

Clearly, to cover the range of issues of relevance to defence support systems, this new journal is quintessentially multidisciplinary and accommodating of a corresponding broad range of disciplines and traditions. Its intended readership covers defence scientists and engineers, operational personnel, defence planners and capability developers, the defence acquisition community, and defence industry engaged in both equipment provision and support.

It is a mighty challenge to engage such a broad community but one that is aligned well with the general consensus of the future of engineering systems research. I wish it a great future!

#### **Note**

<sup>1</sup>*Defence Capability Development Manual 2006*, Australian Department of Defence, P26.