

IAF SPACE OPERATIONS SYMPOSIUM (B6)
New Space Operations Concepts and Advanced Systems (2)

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REVOLUTIONIZING SPACE TRAFFIC MANAGEMENT

Abstract

In June of 2018, the President signed Space Policy Directive 3 (SPD-3), which dictates that the Department of Commerce (DoC) will take on responsibility for management of non-military-specific space traffic from the Department of Defense. Given the ever-increasing number of launches and space objects, this will require a significant increase in technical resources at the DoC. The Defense Advanced Research Projects Agency (DARPA) has developed a revolutionary new software ecosystem for Space Battle Management Command and Control (BMC2) called Hallmark. It seeks to increase space operators' space domain awareness through a modular, agile software suite. In the past, Space BMC2 has relied upon large monolithic software systems, which could not adequately address data interpretation challenges posed by the space environment nor keep up with its rapid rate of change. This type of system will not be sufficient to support the DoC's new space traffic management mission. The shift of responsibility between the DoD and the DoC provides a natural opportunity to revolutionize the approach to national space traffic management. The tools, agile acquisition methods, and artificial intelligence (AI) applications developed under the Hallmark framework could both contribute a good solution to the DoC's new edict under SPD-3. First, the modularity of the Hallmark framework would allow the DoC to use only those tools which serve its purposes, leaving aside those which are perhaps better suited to DoD-specific uses. This modularity would also support the development of a robust private-sector tool community, which is one of DoC's goals for their space traffic management regime. Second, the agile acquisition approach developed under Hallmark would support the rapidly evolving space traffic management approach. In this acquisition model, dubbed the "Zero Integrator Model", the individual teams are responsible for integrating themselves into the larger software framework, with overarching guidance from the government. This approach allows for a diverse suite of software tools to work together toward a common mission, without the sometimes cumbersome requirements generation process. Third, Hallmark has made significant strides in the use of AI for space traffic management, space domain awareness, and pattern of life recognition. These three areas are vital for managing an increasingly crowded space traffic pattern. The Department of Commerce's new mission provides an excellent opportunity to exercise DARPA's revolutionary space traffic management capabilities. Between the diverse, modular suite of space domain awareness tools, the fast-moving agile acquisition process, and cutting-edge AI, DARPA can provide a robust technical foundation to help the DoC fulfill its new mission under SPD-3.