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Adapting Air Force Test and Evaluation to Emerging System Needs

Abstract

The Air Force owns and operates an extensive network of facilities for developmental and operational test and evaluation (T&E). This study addressed the characteristics of emerging systems that will place new demands on T&E capabilities and their underlying key drivers. These characteristics include complex, software-defined capabilities; cyber vulnerabilities; autonomous and self-learning systems; and the need to operate in advanced threat environments, which make emerging systems fundamentally different from current and past systems, requiring significant changes in T&E. Technical solutions to address T&E of these emerging systems include integrated use of modeling and simulation, software and cyber design-for-test, test data analytics, and trust metrics for non-deterministic systems. Additional non-technical solutions include T&E integration into the Air Force's Developmental Planning process and addressing T&E workforce and skill sets. Above all, T&E is a cradle-to-grave consideration. From the beginning of concept definition, through development, developmental and operational test, and throughout the life cycle of any weapon system, there must be a process to allow for the recognition of deficiencies that arise due to hardware, software, or the environment and the mitigation of these deficiencies in a timely, cost-effective manner.