SUMMARY

INTRODUCTION AND MOTIVATION

To be able to execute the full spectrum of aerospace operations, the United States Air Force has transitioned to an Aerospace Expeditionary Force (AEF).[1] Much of the discussion about the AEF concept has focused on changes in the way the Air Force is organized and provides forces to joint-service force commanders. The AEF construct concerns rapidly deploying, employing, and sustaining aerospace power around the globe, from a force structure that is predominantly located within the Continental United States (CONUS). These AEF global force projection goals present significant challenges to the current combat support (CS) structure. The AEF's requirement to respond quickly means that force and support packages must be tailored quickly to meet the operational needs of the specific contingency. The deployment and sustainment of CS resources must be coordinated to arrive at forward operating locations (FOLs) so that initial and sustained operations can take place without interruption. Most of the resources needed to support operations (munitions, housekeeping, and so forth) are not part of the deploying units. Scarce resources must be allocated to units with the highest priorities, often from different regions of the world. Thus, initiating and sustaining AEF operations require planning and control of a global network of CS resources from organic and industrial sources.[2]

AGILE COMBAT SUPPORT COMMAND AND CONTROL

This report presents concepts for guiding the development of a CS command and control operational architecture for the Aerospace Expeditionary Force. The concepts were developed from an analysis of AEF doctrinal changes, evolving

[1] When first introduced, the term EAF was used to describe the concept of employing Air Force forces rapidly, anywhere in the world, in predefined force packages called AEFs. The terms have since evolved and the Air Force now uses the term AEF to describe both the concept and force packages. Whereas previous RAND reports in the Supporting Expeditionary Aerospace Forces series refer to EAFs, we now use the term AEF to maintain consistency with Air Force usage.

[2] Previous RAND analyses offer recommendations for such an infrastructure, which would include forward operating locations from which missions would be flown and forward support locations/CONUS support locations for regional repair and storage facilities, a transportation system for distribution, and a combat support command and control system. See Tripp et al., *Supporting Expeditionary Aerospace Forces: A Concept for Evolving the Agile Combat Support/Mobility System of the Future*, RAND, MR-1179, 2000.

practices, Joint Universal Lessons Learned (JULLs) from exercises and experimentation, information from Air Force personnel, lessons from the Air War Over Serbia (AWOS), preliminary analysis of Operation Enduring Freedom (OEF) and Operation Noble Eagle (ONE), and results of our analysis of the current CS Command and Control (C2) operational architecture.

DEFINING CS EXECUTION PLANNING AND CONTROL AND OPERATIONAL ARCHITECTURE

Joint-service and Air Force doctrine defines C2 as the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission.[3] Specifically, C2 includes the battlespace management processes of planning, directing, coordinating, and controlling forces and operations. It requires the integration of the systems, procedures, organizational structures, personnel, equipment, facilities, information, and communications that enable a commander to exercise command and control across the range of military operations.[4] In a narrow sense, this definition, because it deals with battlespace management, includes C2 functions with respect to the operational and tactical levels of warfare. We build on this definition of C2 and define CS execution planning and control to include the functions of planning, directing, coordinating, and controlling CS resources to meet operational objectives.[5] An operational architecture, by definition, describes the tasks, operational elements, and information flows required to accomplish or support a Department of Defense (DoD) function or military operation. It defines the types of information exchanged, the frequency of exchange, which tasks and activities are supported by the information exchanges, and the nature of information exchanges in sufficient detail to ascertain specific interoperability requirements.[6] For our study, we use these definitions, applied to Air Force CS activities, to identify and describe the processes involved in CS execution planning and control at each echelon and across each phase of operation.[7]

Our study defines and analyzes the current doctrinal CSC2 (*AS-IS*) architecture, identifies changes needed in the *AS-IS* architecture to realize AEF operational goals

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[3]Joint Pub 1-02, *DoD Dictionary of Military and Associated Terms*, April 12, 2001.

[4]U.S. Air Force, *Air Force Basic Doctrine*, Air Force Doctrine Document 1 (AFDD-1), September 1, 1997.

[5]Although our work here primarily discusses the operational and tactical levels of warfare, we believe that the CS execution planning and control definition includes the strategic level as well—e.g., over the Program Objective Memorandum (POM) process in which CS plans are assessed, monitored, and controlled.

[6]Department of Defense, *C4ISR Framework Document Version 2.0*, December 18, 1997. The command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) framework is intended to ensure that the architectures developed by geographic and functional unified commands, military services, and defense agencies interrelate between and among the organizations' operational, systems, and technical architecture views, and are comparable and integrated across joint-service and multinational organizational boundaries.

[7]Rather than view the results of this study as a combat support command and control (CSC2) operational architecture, which would promote the concept of a stovepiped, non-integrated architecture, we address CS execution planning and control processes in the context of the larger Air Force C2 architecture.

and correct deficiencies identified during recent contingencies, and sets forth concepts in some detail for the future (*TO-BE*) architecture.

CSC2 *AS-IS* SHORTFALLS AND RECOMMENDATIONS TO MEET THE *TO-BE* ARCHITECTURE

Our analysis of the Air Force's CS execution planning and control process revealed important shortfalls in the *AS-IS* architecture. These shortfalls can be grouped into four categories:

- Poor integration of CS input into operational planning
- Absence of feedback loops and the ability to reconfigure the CS infrastructure dynamically
- Poor coordination of CS activities with the joint-service community
- Absence of resource allocation/prioritization mechanisms across competing theaters.

We propose a *TO-BE* CS execution planning and control architecture system that would enable the Air Force to meet its AEF operational goals. The architecture would enable the CS community to quickly estimate support requirements for force package options and assess the feasibility of operational and support plans. The architecture would permit quick determination of beddown needs and capabilities, facilitate rapid Time Phased Force and Deployment Data (TPFDD) development, and support development and configuration of a theater distribution network to meet Air Force employment timelines and resupply needs. The *TO-BE* architecture would facilitate development of resupply plans and monitor performance, determine impacts of allocating scarce resources to various combatant commanders, indicate when CS performance deviates from desired states, and facilitate the development and implementation of "get-well" plans.

Finally, this report offers recommendations to help the Air Force CS community move from the current architecture to the future concept we describe. We recommend:

- Summarizing and clarifying Air Force CS doctrine and policy. The objectives and functions of execution planning and control must be recognized and codified in doctrine. The functions of concurrent development of plans among operators and CS personnel, assessment of plan feasibility, use of feedback loops to monitor CS performance against plans, and development of get-well planning need to be articulated and better understood.
- Creating standing CS organizations to conduct execution planning and control. The Air Force has supported one contingency after another for the last decade. Standing (permanent) organizations are needed to conduct CS functions and reduce turbulence and problems associated with the transition from supporting one contingency to reshaping support processes to meet the needs of another contingency.

- Training operations and CS personnel on each other's C2 roles. Understanding each other's responsibilities and methods can facilitate incorporation of both aspects into operational plans.
- Fielding appropriate information system and decision support tools to translate CS resource levels and processes into operational capabilities or effects. This will improve understanding of CS constraints or value for an operational planning option.

CONCLUSION

The strategic and operational environment and the AEF concept that addresses it present significant challenges to the current CS structure. To meet AEF stated objectives, the CS community is reexamining its current support system. Correcting deficiencies in CS execution planning and control as identified in this report is integral to the success of this effort.