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Supporting Air and Space Expeditionary Forces

Analysis of Maintenance Forward Support Location Operations

Amanda Geller, David George, Robert S. Tripp,
Mahyar A. Amouzegar, C. Robert Roll, Jr.

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Summary

Since 1990, the United States military has been called upon to support crises that range from Operation Desert Storm to humanitarian relief operations. These operations create a diverse and unpredictable set of sortie-generation needs, from air-to-ground combat to the transport of food and supplies. To meet these demands, the Air Force is reorganizing into an Air and Space Expeditionary Force (AEF). Behind this new vision of force management is the idea that forces able to deploy quickly and frequently from the continental United States can replace the permanent forward presence of airpower that the Air Force employed during the Cold War.

However, deploying airpower quickly and frequently strains the Air Force's current combat support system. The original concept of the AEF called for deploying the entire combat and support infrastructure from the continental United States. However, the resources needed to support a combat deployment are heavy, and require significant airlift and time to move to the theater. Furthermore, the need to redeploy the entire support structure with each combat deployment limits flexibility and creates instability among personnel. The Air Force is consequently reexamining its support infrastructure to focus on new goals: faster deployment, reduction in the mass of materiel to move, increased flexibility, and greater personnel stability. This study examines one potential reconfiguration of the Air Force's current support system: the creation of maintenance Forward Support Locations (FSLs) to consolidate intermediate maintenance near, but not in, the theater of operations.

Centralizing the Intermediate-Maintenance Infrastructure: Forward Support Locations and the AEF

Over the past sixty years, a range of factors—from historical events and operating environments to personnel, equipment, and spares constraints—has led Air Force support policy to oscillate between two types of infrastructure: decentralized and centralized. In a decentralized maintenance structure, each unit or wing maintains the ability to make intermediate repairs to its own assets at its main operating base. A centralized infrastructure, on the other hand, calls for numerous units to share one or more maintenance facilities, either in theater, at other locations overseas, or in the continental United States. Combat units at forward locations send items needing intermediate maintenance to these facilities, where they are repaired and then returned to the units.

The unpredictability of the AEF environment has led RAND and the Air Force to call for a support infrastructure flexible enough to be tailored to meet the demands of any contingency. RAND calls its vision of a new structure an Agile Combat Support (ACS) network. Within this vision, intermediate-maintenance activities, which are performed away from the aircraft at base shops, offer potential for significant change. Centralizing these activities has the potential to improve overall support performance.

The Air Force has studied centralized intermediate-maintenance facilities on several occasions, and has implemented them at times in tests and real-world operations. The appeal and effectiveness of centralization have depended on a variety of factors, including operational needs, availability of maintenance equipment, and risk to deployed units. The development of ACS in the 1990s presented another environment in which centralized intermediate maintenance indicated the potential to improve operations. RAND conducted several analyses to determine the effectiveness of Centralized Intermediate Repair Facility (CIRF) support for a series of commodities: F-15 avionics components, LANTIRN pods, and jet engines. In addition, RAND examined potential locations for CIRFs, the concept of deployment footprint (a key metric of CIRF efficiency), and the

command and control system used to support repair and other processes. (See p. 36.)

While all maintenance options, ranging from complete decentralization to centralization of repair functions in a single facility, involve tradeoffs between reliance on transportation and command and control, the availability of support resources, and other factors, our research has shown that centralization of intermediate maintenance at FSLs (which the Air Force calls CIRFs) has the potential to help the Air Force reduce its deployment timelines, increase flexibility, and otherwise meet its expeditionary goals.

In 1999, the Air Force implemented CIRFs on an ad hoc basis during the Air War Over Serbia (AWOS). Centralizing intermediate-maintenance activities provided an effective level of support, at far lower equipment and personnel deployment levels than those required by decentralized repair. However, the ad hoc implementation led to complications and delays in decisionmaking. The Air Force determined that a formal test would allow a comprehensive look at CIRF operations without the difficulties faced during the AWOS.

The Air Force CIRF Test

RAND's research in the 1990s and the performance of maintenance FSLs during the AWOS contributed to the Air Force's decision to formally test the centralized intermediate-maintenance concept. The Air Force directorate of Installations and Logistics (AF/IL) developed a detailed concept of operations and test plan that defined the roles and responsibilities of European CIRFs in supporting steady-state operations in Southwest Asia, from September 2001 through February 2002.

The six-month CIRF test demonstrated that centralized intermediate maintenance was capable of supporting steady-state operations with a reduced deployment footprint. Furthermore, the command and control network supporting CIRF operations allowed the system to recognize when operational goals were in jeopardy and to adapt support resources to meet the required sortie schedule. In short,

the test proved that centralized intermediate repair could help the Air Force meet its goals of faster deployment, smaller footprint, and reduced personnel, equipment, and force protection requirements.

At the same time, the CIRF test pinpointed several opportunities for improvement. Deployment management and transportation problems led to delays in CIRF operations, and shortfalls in command and control led to confusion of responsibilities and difficulties in effectively allocating resources. The Air Force has undertaken studies to improve both of these systems. (See p. 60.)

Next Steps in Implementing the Agile Combat Support Network

Despite the considerable achievements of the CIRF test, other issues must be addressed if the Air Force wants to implement a truly global ACS system. For example, under certain circumstances, CIRFs located in the continental United States might provide the best intermediate-maintenance support. Accordingly, the Air Force has begun to examine the requirements for establishing CIRFs at domestic sites. Furthermore, several questions about the ownership of assets need to be resolved for the Air Force to attain the full benefits of FSLs. Currently units "own" their assets, which prevents pooling of assets at FSLs or other locations where they are needed most. Changing the current policy to centralize ownership of maintenance equipment, facilities, and components will enable FSLs to operate more effectively. However, this centralization will require modifications to the current command and control organizational structure to ensure centralized decisionmaking that will help units meet their operational requirements. (See p. 88.)

This report reviews much of the research and testing that show the advantages maintenance FSLs offer as part of a full ACS system and discusses the problems that remain and how they might be resolved.