

Equipment Component Support Function of Available Fleet Scale & Demand for Dispatch Service Pooling of Installations

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Competing mission requirements between airwings, means aircraft availability must be secured by providing aircraft fleet with efficient component support.

Availability services in general & aircraft component support in particular, have been examined under such topics as split up demand, cost structure of availability services & benefits of spare part cache pooling implementation.

One of most important factors in airwing operation is availability of aircraft for scheduled missions, i.e. technical dispatch reliability. Dispatch reliability is kept at adequate levels by upgrade/repair functions.

Success is achieved by replacing failed units, i.e. aircraft components, quickly by functional units & repairing the failed units afterwards. Technique allows aircraft to continue operation immediately without waiting for repair work to be completed.

Demand for aircraft component availability services is usually split up. Airwings operate with disparate fleets from many installation hubs. DoD has strong interests in keeping spare units required by supporting fleets as close as possible.

In contrast, availability services stand to benefit from demand consolidation since demand is caused by random component failures. DoD cost pressures require efficiency improvements in availability services & must be performed without compromising dispatch reliability.

Airwing fleet structure has big impact on costs & demand split up of component availability services. Models can measure uniformity of airwing fleets & potential for achieving scale economies.

Considering one installation providing spare components for its operations in-house, the scale of its fleet determines cost levels of availability service. When several airwings operate in same region, scale of total fleet determines potential for achieving economies by cooperative arrangements between installations.

Models show deficits in commonality of fleets along increased fleet scale have been steadily increasing. Decreasing commonality causes extensive complexity in DoD processes, but increasing scale allows new levels of efficiency to be achieved.

Predominant availability service costs include ownership cost of spare units, originating directly

from valuation/depreciation principles applied. Challenges in repairable components valuation is that, unlike other capacity assets & disposable spare parts, components keep changing between capacity function & spare part function.

Components require different valuation/ depreciation rules: 1) Revenue generating function as common capacity assets 2) preservation of mission requirement function as spare components & 3) Situations when changing from one function to the other.

Availability models provide simple & feasible pooling arrangement with increased return of availability service costs if installation participants are willing to endure some delivery delays from a remote pool stock.

Installation pool participants experience higher service levels with lower cost but must wait for spare units longer compared to airwings providing its spare components in-house. Cost savings achieved by entire pool is determined by total fleet scale of cooperation implementation.

Pooling benefits under optimal conditions are generally higher when more demand for one component type is served by one pool. Conflicting interests between participating installations have the potential to result in less efficient pooling arrangements.

Primary causes of conflict involve issue of allocating availability service costs between pool participants, frequently complicated by split up spare component demand.

Deeper dives examining route creation implementing pooling are required to measure potential of each option to capture pooling benefits in availability service of airwing components against much variation in external conditions.