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A Common Operating Picture for Air Force Materiel Sustainment

First Steps

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Summary

The Air Force materiel sustainment system (MSS) is continually caught between two countervailing forces: demands for increased efficiency and lower costs on one side, and demands for increasingly effective support to combat operations and peacetime training on the other.[2] Compounding the situation, the Air Force is currently facing more unpredictable operational demands—in terms of both their location and their required operating capabilities.

We envision a materiel sustainment system common operating picture (COP) that would better synchronize the MSS's activities—enhancing responsiveness to changing operational needs, reducing opportunities for unintended wasted effort, and coordinating efforts to improve support in one agency while ensuring that complementary efforts in another area are accomplished.

Underlying Principles for a Common Operating Picture

The notion of a COP is one that resonates with many people who work in large organizations. Ideally, it would provide common guidance and progress assessment that all parts of the organization could use to

[2] We chose the term *sustainment* rather than *operations and support* because the former includes all the activities associated with operating a fleet throughout its entire life cycle, including modifying the fleet to increase its airworthiness (flight safety), efficiency, or effectiveness in its current missions or its ability to conduct other missions. Under this definition, we include activities that change the fleet's capabilities, not just those that restore them.

assess their own contributions and view their mutual achievements as an integrated whole. While it would set explicit goals for both overall system performance and individual agencies, it would also define sentinels—active monitors of leading indicators that signal when the overall system's performance may fall below intended levels.

To develop a COP that achieves the goal of synchronizing a large organization's activities, we turn to four organizing principles: effects-based measures, *schwerpunkt*, decision rights, and a nonmarket economic framework. Use of effects-based measures consists of first defining the goals or objectives that an organization wants to achieve, then defining (generally long-term) measures of effectiveness (MOEs) for associated goals, and, finally, deriving measures of effectiveness indicators (MOEIs) to monitor progress toward those goals. *Schwerpunkt*, which means "focal point," is a notion drawn from physics and German military doctrine that emphasizes achieving the commander's intent regardless of unplanned events that may render the original plan obsolete, with even the lowest-level subordinates given wide latitude to take independent action to respond more quickly to those unplanned events. Decision-rights theory provides a framework that helps one decide which agency or person should make a particular decision, based on the information, decision capacity, and incentives that each agency faces. Finally, the nonmarket economic framework recognizes that inefficient conflicts can arise when a competitive market does not exist and that, therefore, there is a need for a neutral integrator to help resolve conflicts between demand-side and supply-side agencies within large complex organizations such as the Air Force.[3] (See pp. 5–18.)

[3] In a military context, one can view the demand side as being operational forces that require personnel, equipment, materiels, fuel, and services; the supply side would be the combat support activities that provide those resources. Thus, the combat support activities would be the rough equivalent of the supply chain that stretches from the local store to a manufacturer in a commercial context.

A Procedure for Developing a Common Operating Picture

We then define a process for applying these principles. The process consists of eight steps:

1. Identify the organization's broader objectives.
2. Relate those objectives to effects that the supply side must produce.
3. Identify measures of effectiveness.
4. Identify the processes and decisions that can affect each MOE.
5. Identify practical, comprehensive MOEIs and alarm thresholds for each MOE.
6. Assign the decision rights for the demand side, supply side, and neutral integrator to the lowest-echelon agency with the appropriate information and decisionmaking capacity.
7. Adjust the incentives for that agency to reward performance against the relevant MOEIs.
8. Periodically review these steps and adjust the COP and decision rights accordingly. (See pp. 19–31.)

An Example: Depot-Level Reparables for Aircraft

We then applied that process to the activities associated with aircraft DLR sustainment, noting that other sustainment activities might contribute to other Air Force objectives. We identified five objectives associated with aircraft sustainment:

- operational suitability
- mission reliability
- airworthiness
- availability
- sustainment cost.

Then we narrowed in on the availability objective to define an MOE—aircraft not fully mission capable for DLRs (NFMCD)—

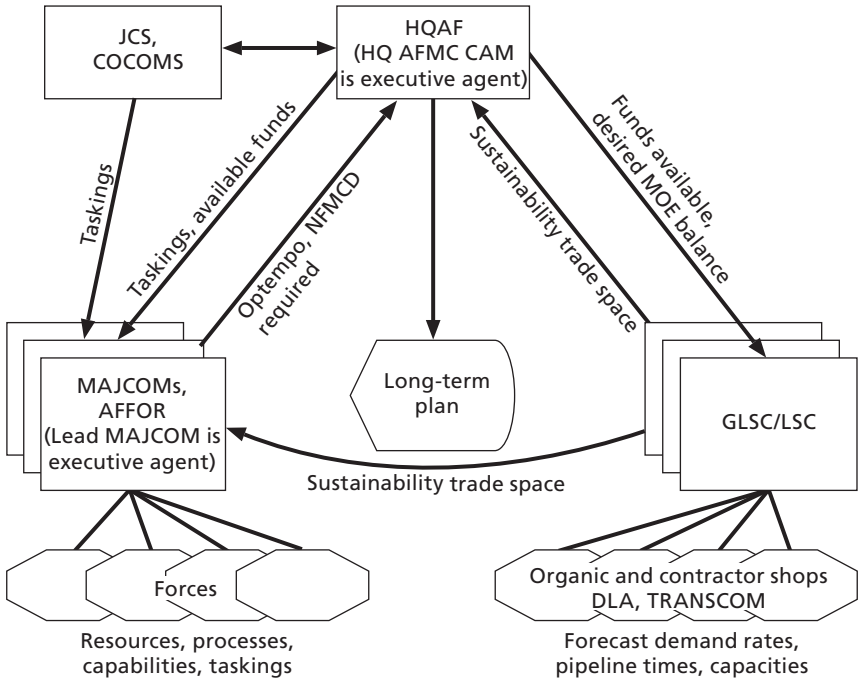
that is associated with DLR sustainment.[4] With that in mind, we then identified several MOEIs (aircraft operational tempo [optempo], item demand rates, and various pipeline quantities and trends) that might act as leading indicators. (See pp. 33–48.)

With the MOEs and MOEIs in hand, we then assessed the current DLR sustainment system's ability to plan, monitor, and control NFMCD levels consistent with both the available funds and the needs of the demand side. To perform that task, we identified the range of decisions made throughout the Air Force that can affect NFMCD and selected two key decisions for further analysis: planning financial resources for DLR sustainment and reallocating financial and other resources to meet changing operational requirements. Then we applied a decision-rights matrix to evaluate the information available to the many agencies whose decisions can affect NFMCD during planning and execution. Because the planning system does not use NFMCD consistently throughout the financial planning process, we evaluated how such a system might work if NFMCD were available. This led to a suggested organizational arrangement for DLR sustainment planning. As shown in Figure S.1, this organizational structure envisions that a newly created AFMC Centralized Asset Management office (AFMC CAM)[5] would act as a neutral integrator to help the demand side (the major commands [MAJCOMs] and the Air Force forces [AFFOR] assigned to combat commanders [COCOMs]) and the supply side (maintenance, supply, and transportation supply-chain agencies and suppliers whose efforts will be coordinated by the newly designated GLSC develop a long-term DLR support plan. The neutral integrator's

[4] This measure expands the scope of a related measure—not mission capable (because of) supply shortage (NMCS)—to encompass the full effects of the end-to-end DLR support enterprise. First, it includes situations in which local base repair shops are repairing a component that could make an aircraft fully mission capable (FMC). Second, it includes situations in which an unserviceable component leaves an aircraft partially mission capable (PMC), that is, able to perform only a subset of the full range of missions for which it was designed.

[5] CAM is both a "system" and an AFMC office within that system. The office plays a lynchpin role in planning and managing the allocation of funds to Air Force sustainment activities, thereby assuring responsive support to all the MAJCOMs and COCOMs—within the limits of available resources.

Figure S.1
The AFMC Centralized Asset Management Office Is the Neutral Integrator for DLR Sustainment Financial Planning



NOTE: The "GLSC/LSC" in the figure represents the Air Force's current transitional situation, in which implementation of the GLSC is still under way and, therefore, separate MAJCOM logistics support centers (LSCs) supplement the GLSC.

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role would be to ensure that the plan balances future support among the various demand-side agencies based on operational needs and priorities while also exploiting the supply side's financial and physical production resources to the fullest extent possible. To achieve this, the neutral integrator (in this case, AFMC CAM) would seek explicit agreement between the supply side and the demand side about the MOEs (operational tempo and NFMCD levels) to be achieved. (See pp. 48–98.)

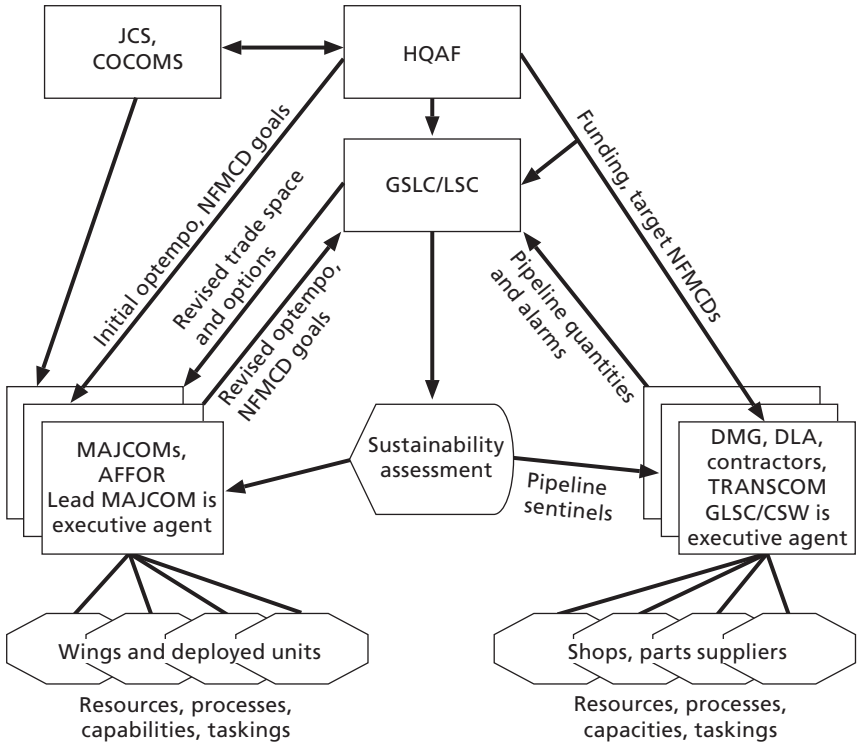
In execution, the current DLR sustainment system has several processes that can remedy the inevitable imbalances across fleets and units when demands do not arise as predicted. Unfortunately, the cur-

rent processes can only mitigate imbalances once they become apparent; they cannot prevent imbalances from occurring. Because the DLR support system requires some repair and transportation times to respond to any imbalance, it must always play "catch up" if it relies solely on the current state for guidance.

To give the DLR sustainment system a more proactive posture, we identified how the new GLSC might monitor the NFMCD-based MOEIs during execution to detect underlying demand and DLR support process changes that might threaten the planned NFMCD level—before changes in that level reach unacceptable bounds. Thus, we suggest an organizational arrangement in which the GLSC acts as a central communications conduit and overall system monitor between the suppliers and the demanders of DLR sustainment activities. As shown in Figure S.2, the GLSC would monitor MOEIs (e.g., optempos and pipeline quantities) that reflect ongoing operations of all agencies in the supply side (including AFMC-owned and -operated agencies, such as the Depot Maintenance Activity Group [DMAG], and external suppliers, such as the Defense Logistics Agency [DLA], the Transportation Command [TRANSCOM], and the numerous contractors that repair DLRs) and the demand side (MAJCOMs and COCOMs). To support that process, the execution COP would embody active monitors of the MOEIs that we call sentinels. Those sentinels would periodically compare the MOEIs to their alarm thresholds, which would be derived from the NFMCD-based sustainment assessments developed for the planning COP. Both the MOEIs and the sentinels alarms would be available to the demand side and the supply side to monitor and control their own operations, while the GLSC would focus on those MOEIs that may signal some long-term, widespread, or other critical supply/demand side imbalance.

Almost certainly, some portions of the supply side will be unable to fully implement the detailed plan developed during the planning process. Equally probable, some portions of the demand side will find that their operational requirements change in response to new taskings or missions. In many cases in which the disruption to the original plan is short or small, the supply-side resources may be flexible enough to respond to those changes without breaching the original NFMCD

Figure S.2
GLSC Is the Neutral Integrator for Execution



NOTE: The "GLSC/LSC" in the figure represents the Air Force's current transitional situation, in which implementation of the GLSC is still under way and, therefore, separate MAJCOM logistics support centers (LSCs) supplement the GLSC.

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goals for each force. When the disruption is larger, the GLSC would undertake a replanning effort in concert with the supply and demand side agencies that would rebalance the supply-side and the demand-side activities—for the near term. That revised plan might lead to changing the financial or other resources available on the supply side or changing the optempo or NFMCD goals on the demand side, depending on the circumstances and the overall military requirements.

Conclusions and Next Steps

As appealing as this conceptual DLR planning and control system design may appear, we anticipate that considerable refinement and extension will be needed for this design to be applied successfully. Certainly, any application of the new system design will encounter constraints and procedures that, while effective or efficient in the current planning and control system, may interfere with this system's conceptual foundations. Over time, those processes will need to be revised to enhance the planning and control system's ability to ensure the intended NFMCD levels efficiently.

Finally, the process used to define a COP for DLRs could be applied to other materiel sustainment activities and product lines. (See pp. 99–101.)