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# Efficiencies from Applying a Rotational Equipping Strategy

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# Summary

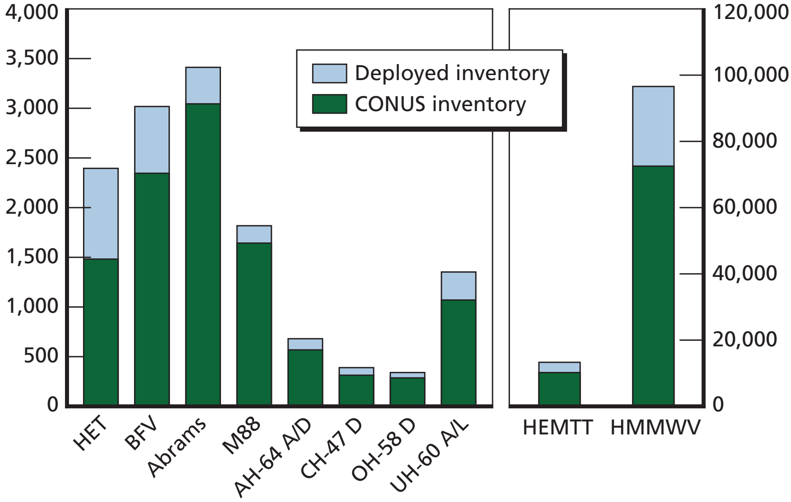
## Background and Problem

The past near decade of conflict in Iraq and Afghanistan has changed the way the force is managed. To meet the demands of protracted conflict in those theaters, the Army has adopted a rotational deployment strategy based on the Army Force Generation (ARFORGEN) model. In this model, units rotate through various levels of readiness, with a portion (approximately one-third) immediately available for deployments as part of a full-spectrum force. With this new strategy, and unlike the tiered readiness strategy of years past, all units pass through high-readiness phases during a portion of their ARFORGEN cycle.

While many of the Army's policies have adapted to the ARFORGEN model, the equipping policies still largely reflect Cold War tradition to provide active, Reserve, and National Guard units with 100 percent of their authorized equipment at all times during the ARFORGEN cycle. Since units are rotating through various states of readiness—and at times can be multiple years from any deployment—the utility of such an equipment policy is questionable.

Data from a snapshot of equipment locations illustrate the potential problem (Figure S.1). In 2007, somewhere between only 10 and 40 percent of available high-end equipment was deployed during a period of time in which the United States was engaged in one of the largest sustained deployments in recent times. From an efficiency standpoint, the Army may be able to find considerable efficiencies by bringing its equipment fill levels more in line with other unit readiness levels.

**Figure S.1**
**Deployed and CONUS Inventory During a Snapshot in 2007**




SOURCE: W. M. Solis, *Defense Logistics: Preliminary Observations on the Army's Implementation of Its Equipment Reset Strategy*, Washington, D.C.: United States Government Accountability Office, 2007.
NOTES: BFV = Bradley Fighting Vehicle, HEMTT = heavy expanded mobility tactical truck, HET = heavy equipment transporter, HMMWV = high-mobility multipurpose wheeled vehicle.
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## Analyzing the Rotational Equipping Strategy

In order to analyze the potential impacts of reduced equipment and what that might mean to the force, we constructed a simulation of unit deployments, based on ARFORGEN, to determine equipment inventories to support steady-state and surge operations. The model evaluates current or planned force structure and equipment,[1] demands for deployments, and policies governing rotating units and equipment to determine the amount of equipment necessary to meet Army

[1] For this analysis, we winnowed the list of items and units for which an RES would work best to those with sufficient number (>300), those with appreciable value (>$100 million in total replacement cost), and those items low in stock compared with authorizations. This provides a starting point for the items to which an RES would best be applied and should be updated as more information becomes available as the strategy is executed.

goals. From the modeling, we are able to determine how far equipment levels might be suppressed while still meeting training and deployment needs. To do so, we defined two alternative strategies for equipping units through the ARFORGEN cycle. These we termed the *rotational-low* and the *rotational-high* levels of aggregate equipment.[2]

The outputs of our analysis show how many major end items the Army would require for each strategy. As shown in Table S.1, the quantities of many of the Army's most prominent systems might feasibly be reduced up to 25 percent through an RES while still meeting training and potential surge demands for forces. For some of the equipment, the reductions are much smaller, owing to the force structure, broad utility of the equipment, and ratio of specific types of active component (AC) and reserve component (RC) units.

There are many implications of adopting an RES. First, the reduced equipping levels mean that during steady-state operations, the Army would have to set specific levels for equipment fills for major equipment that are in line with the training and potential surge needs of the force. These numbers will change from item to item, and thus a nuanced look at each item is necessary. The examples we show are based on discussion with Army planners and can be updated as more detailed information is available.

Second, during surges of forces, the Army would need to ready units and the support infrastructure to transition considerable equipment from units in the United States to units deployed in theater, as well as equipment from units returning to home to other units in the continental United States. The RES is predicated on equipment being resident somewhere in the Army for surge deployments, and, therefore, a sharing of equipment (with all attending cultural and logistical implications) will need to be worked out.

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[2] The rotational-high level plans for a reduced amount of equipment in early phases of ARFORGEN and preserves those fill rates regardless of surge requirements (e.g., equipment cannot be pulled from units that are not deployed). The rotational-low level plans for a further-reduced amount of equipment to some minimum amount necessary for training purposes and allows units that are deploying to "borrow" equipment from units not deployed during surge situations.

**Table S.1**
**Rotational-High and Rotational-Low Numbers for Some Major End Items**

| System | Total (MTOE + TDA + APS) | Rotational-Low Number (% of Total) | Rotational-High Number (% of Total) |
|---|---|---|---|
| AH-64D | 772 | 550 (71%) | 688 (89%) |
| CH-47 | 404 | 368 (91%) | 398 (98%) |
| UH-60 | 1,467 | 1,351 (92%) | 1,446 (98%) |
| HH-60 | 570 | 522 (92%) | 561 (98%) |
| M109 | 616 | 454 (73%) | 567 (92%) |
| M1A1 | 1,100 | 878 (80%) | 1,028 (93%) |
| M1A2 | 832 | 664 (80%) | 774 (93%) |
| M2A2 | 998 | 753 (75%) | 905 (91%) |
| M2A3 | 953 | 778 (82%) | 889 (93%) |
| M2A2ODS | 351 | 246 (70%) | 316 (90%) |
| M7 BFIST | 315 | 227 (72%) | 276 (88%) |
| M3A2 | 564 | 450 (80%) | 520 (92%) |
| M3A3 | 402 | 314 (78%) | 368 (92%) |

NOTES: The data above only include combat aviation brigades, theater aviation brigades, fires brigades, and heavy brigade combat teams for all equipment. APS = Army prepositioned stock, MTOE = modified table of organization and equipment, TDA = tables of distribution and allowances.

Third, the analysis in this report entailed a detailed modeling effort and thus rests on a number of assumptions that will need to be understood, monitored, and updated as circumstances warrant. The analysis is highly dependent on a few of those assumptions, notably the demand assumptions (as detailed in Chapter Two) and rules of how ARFORGEN is executed (see the appendix for additional information on how various input parameters drive the outputs of the model). Other assumptions about rates of equipment lost in combat and transit times are also important and thus amenable to additional analysis and strategies to reduce or control risks. Nonetheless, careful consideration of the assumptions underpinning the analysis can offer insights into how an RES would affect equipping and modernizing the Army.

Fourth, an RES is a significant change in how the Army equips units—and, therefore, a potentially significant change in how soldiers view units and the Army. While this analysis does not detail the cultural changes necessary to implement such a rotational strategy, it will be necessary to include such considerations as the Army moves forward.

**What Might the Rotational Equipping Strategy Mean to the Budget?**

The assumptions detailed in the previous section, therefore, can be considered policy decisions that the Army faces, should it fully execute an RES. There are three assumptions described in this report that bear repeating:

1. The Army will have to decide what demand they will assume for planning purposes—or whether their force structure and rules of ARFORGEN will drive that number.
2. The Army will have to decide how much equipment each unit will get for each piece of equipment during the early phases of ARFORGEN.
3. The rules of ARFORGEN—particularly those associated with deployment and dwell times—need to be formally adopted for equipment planning purposes.

In this report, we assumed answers for all of these decisions through rationales built from senior decisionmakers within the Army, such as the Army's Chief of Staff, and found considerable cost savings potentially available.

Rotational equipping provides opportunities to reduce the total amount of some equipment in the force. The equipment most amenable to an RES is typically the most expensive, has sufficient numbers for swapping among units, can easily be moved and integrated from unit to unit, and is not needed in large quantities for training. Many of the Army's major end items are available for rotational equipping.

The effect that smaller inventories have on the budget is threefold. First, with a smaller target number for a given fleet, the Army can **divest of those systems most in need of repair and recapitalization** until the rotational level is met. The possible cost avoidance from this kind of strategy needs to be determined but would have to be weighed against any increased maintenance costs that could be incurred because of the higher usage rates inherent in a smaller fleet.[3]

Second, there are potential medium- and longer-term savings from **reducing the total number of systems needing upgrades**. The Army's modernization programs are steeped in upgrades to major systems, such as the aircraft and tracked vehicles. If a rotational strategy that allows the Army to lower the overall number of systems needed is adopted, those upgrade programs could reduce the tail ends of the programs to save money. (Note that reducing near-term upgrades is also a possibility but would sacrifice some near-term capability.) As an example, the CH-47, UH-60M, and AH-64 upgrade programs total over $30 billion in fiscal year (FY) 2012 and beyond. Finding a means of reducing the total stock necessary to upgrade will have profound impacts in the mid- to long-term budget, and our analysis shows that $5 to $10 billion of savings is likely. Based on the analysis shown in this report, we estimate that reducing inventories for the Paladin, CH-47, and AH-64 to rotational-low levels of equipment may avoid between $1.7 and $4.0 billion in upgrade costs over the lifespan of their current modernization programs. This depends on whether new builds are forgone or not, in addition to reduction of current inventories. Alternatively, reducing inventories to rotational-high levels may save between zero and $1.1 billion over the same period.[4]

Lastly, a smaller inventory of major end items can provide options for **reducing or even eliminating new purchases in the near term**. Since current Army plans call for the procurement of replacement air-

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[3] Analysis has not yet been performed to determine which case costs more for specific platforms: smaller fleets used intensely or larger fleets used sporadically.

[4] All numbers are in then-year dollars and are approximately $0.3 billion for ten D to F conversions in the Chinook, $0.5 billion in the Paladin upgrades if 89 of the upgrades are avoided, and $0.9 billion in FY 2023 and FY 2024 if 85 Apache Block III upgrades are avoided.

craft, vehicles, and weapons, a smaller overall Army requirement may offer the opportunity to eliminate or reduce those purchases. As an example, the two new combat aviation brigades that the Army is standing up based on the 2010 *Quadrennial Defense Review* (QDR) will lead to new purchases of both CH-47s and AH-64s, for a combined cost of approximately $4.5 billion. Our analysis of a few examples shows how reducing the overall Army authorization levels can reduce near-term procurements totaling billions of dollars across the Five Years Defense Plan. Specifically, we estimate an avoidance of up to $4 billion for the CH-47 and AH-64 fleets if rotational-low levels are adopted.[5]

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5 This breaks down as approximately $2.1 billion for the 56 new-build Apaches and another $2.1 billion for the new Chinook purchases.