This product is part of the RAND Corporation technical report series. Reports may include research findings on a specific topic that is limited in scope; present discussions of the methodology employed in research; provide literature reviews, survey instruments, modeling exercises, guidelines for practitioners and research professionals, and supporting documentation; or deliver preliminary findings. All RAND reports undergo rigorous peer review to ensure that they meet high standards for research quality and objectivity.

TECHNICAL REPORT

Policy and Methodology to Incorporate Wartime Plans into Total U.S. Air Force Manpower Requirements

Manuel J. Carrillo, Hugh G. Massey, Joseph G. Bolten

TR-144-AF

August 2004

Prepared for the United States Air Force

RAND PROJECT AIR FORCE

The research reported here was sponsored by the United States Air Force under Contract F49642-01-C-0003. Further information may be obtained from the Strategic Planning Division, Directorate of Plans, Hq USAF.

Library of Congress Cataloging-in-Publication Data

Carrillo, M. J. (Manuel J.), 1949–
Policy and methodology to incorporate wartime plans into total U.S. Air Force manpower requirements / Manuel J. Carrillo, Hugh G. Massey, Joseph G. Bolton.
p. cm.
Includes bibliographical references.
"TR-144."
ISBN 0-8330-3581-9 (pbk. : alk. paper)
1. United States. Air Force—Personnel management. 2. Manpower—United States. 3. Military planning—United States. I. Massey, H. G. II. Bolten, J. G. (Joseph George), 1944– III. Title.

UG773.C37 2004
358.4'122'0973—dc22

2004006980

Published 2004 by the RAND Corporation
1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
201 North Craig Street, Suite 202, Pittsburgh, PA 15213-1516
RAND URL: http://www.rand.org/
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org

Summary

Every few years, the U.S. Air Force reviews its authorized manpower to ensure that it has enough people with the right skills and experience to meet national security demands. During TFA-I, national security demands were expressed by the ability to prosecute two concurrent MTWs, a goal for defense planners at the time. As TFA-I drew to a close in 2001, that planning assumption was being reexamined as defense planners became increasingly interested in scenarios short of two MTWs.

TFA-I treated all existing deployable forces as being required for meeting a two-MTW threat. But because that is less likely with scenarios short of two MTWs, the Air Force found that it lacked a sanctioned method of estimating requirements for such diminished threats. As part of TFA-II, AF/XPM[1] asked RAND to provide a methodology that would fill this void. The principal purpose of this report is to summarize that methodology and illustrate its utility in application, i.e., to postulate demands for MTW-sized scenarios but less than two MTWs and estimate requirements on that basis.

RAND also participated, mainly as an observer, in TFA-I. We were given the opportunity to comment on the methodology along the way, which we did. At the end of TFA-I, RAND received from the Air Force copies of the TFA-I time-phased force and deployment data (TPFDD) and the TFA overall requirements file, which we analyzed while we developed our methodology for handling scenarios short of two MTWs. We tried to improve upon what we learned from our analysis of TFA-I methodology and results as we developed our new methodology.

We believe that the requirements methodology presented here is relevant regardless of the outcome of the debate on whether requirements estimation is necessary when the Air Force follows the capabilities-based concept. Our view is that the Air Force can achieve greater capability by efficiently trading-off resources to relieve bottlenecks. But feasible trade-offs are only possible when the locations of both the shortages and surpluses are known—in a word, requirements.

[1] That office has now become AF/DPM.

A More Broadly Applicable Methodology

For a given planning scenario, an estimation methodology for overall manpower requirements should be able to account for the following:

- How many positions of what kinds are needed to prosecute the conflict under consideration?
- How many additional positions of what kinds are needed to train the warfighters and otherwise sustain the peacetime force structure?
- How many additional base support positions are needed to sustain the warfighters?

Most Air Force combat and support personnel have both wartime and peacetime tasks. Proper estimation of requirements requires a methodology for tracking the peacetime workload that remains and the peacetime jobs made unnecessary by wartime jobs. In principle, *peacetime* jobs are tallied in the Manpower Data System (MDS)—the system that keeps track of authorized manpower by required Air Force Specialty Code (AFSC), authorized grade or skill, the Personnel Accounting Symbol (PAS), etc. The expected demand for *wartime* jobs depends on the wartime scenario. To provide greater specificity, war planners translate their postulated scenarios into the more-detailed TPFDDs.

As noted earlier, the most-important change in going from two-MTW scenarios to smaller MTW-sized scenarios is the possibility that not all current forces may need to be tasked in the smaller scenario. What to do with those untasked forces is a policy issue that needs to be considered outside the manpower modeling world. The conceptual framework and models we used for scenarios short of two MTWs are flexible enough to accommodate alternative policies for dealing with such untasked forces.

First, in our approach to requirements, we chose to follow the TFA-I concept that requires that each MDS manpower position be assigned to one of four categories, as determined by a manpower expert. We call this assignment the BIM classification. Since these categories resemble those used in TFA-I's Base Infrastructure Model (BIM), we refer to these as *BIM-like categories*. These categories are

- deployable forces, including deployable maintenance
- in-place combat forces (strategic nuclear forces, continental air defense, strategic airlift, space, missiles, etc.)

- continuing mission (field operating agencies, headquarters, depots, training, etc.)
- support, including base operating support (BOS).

To avoid double-counting (the rationale is given shortly), we also extend the BIM classification to the TPFDD demands.

Figure S.1 describes a special, illustrative case of our proposed requirements-estimation methodology. Some of the building blocks on the left (MDS broken into categories and hatched area TPFDD overlaid on top) will be selected in a "merge" to build the overall requirements on the right. To demonstrate its adaptability to alternative policies, we have described our methodology using an optional, theoretical overseas forward-presence requirements policy.

Unlike TFA-I, we do not move the entire building block of MDS deployable forces to the requirements column. Instead, we first set as requirements the MDS portion of deploying forces that we consider to be part of forward presence, those of USAFE and PACAF; then, we set as requirements the deployable forces in the TPFDD that are not part of USAFE or PACAF (see Figure S.1).

Next, as in TFA-I, we move the MDS in-place combat and continuing mission forces to the requirements column. Thus, we implicitly assume that the MDS positions in these two categories are sufficient to absorb any workload left behind by the corresponding positions in the TPFDD. TFA-I's two-MTW TPFDD data, for instance, are consistent with the assumption that few TPFDD forces fall into these two categories.

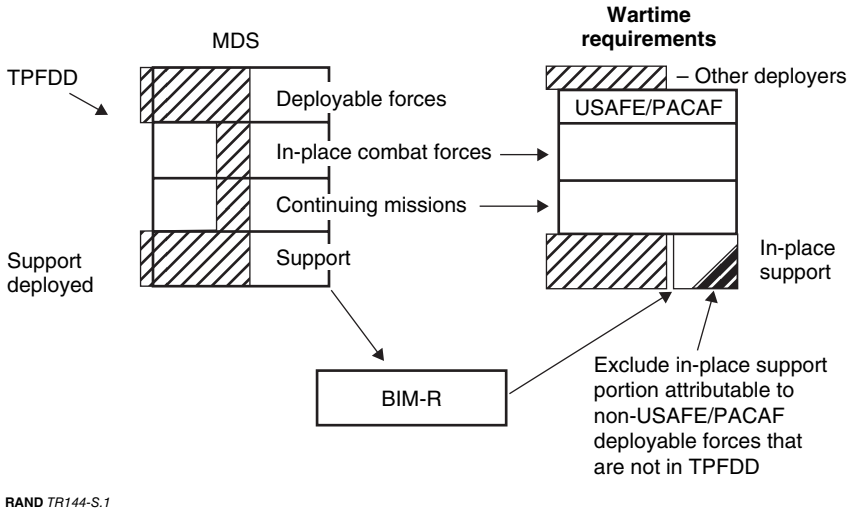

Figure S.1—Conceptual Modeling for an Overseas Forward-Presence Requirements Policy

Finally, we move only a portion of the support building blocks to the requirements column (Figure S.1), the deployable support for the TPFDD and the in-place support for the home base, which we estimated using our variant of BIM (BIM-R). RAND's BIM-R estimates in-place support by adjusting the MDS support positions to account for wartime's longer workweek and for workload changes arising from the departure of TPFDD deployers.

Because our BIM methodology uses all the support as input—including that for forces not used—we have to make one adjustment for the fact that this overseas-presence scenario may leave some forces unused (not all the deployable forces were moved to the requirements column). The effect of this additional adjustment is depicted in Figure S.1 as a dark triangle, which needs to be removed from the requirements for that scenario.

Observations on the Proposed Methodology

Neither TFA-I's approach nor ours estimates manpower requirements for every force and support function from first principles; that would be too massive an undertaking for a relatively small project.[2] Instead, both approaches focus on how to estimate changes to existing manpower requirements.

The resulting requirements are some combination of peacetime and wartime requirements. On the one hand, the requirements include the continuing mission category, which is a large block of MDS authorizations, the data system associated with Air Force peacetime requirements. On the other hand, the requirements include the deployable forces of a TPFDD.

A model similar to the BIM-like model that we used to handle the support BIM category could be useful for adjusting the continuing mission manpower category. Such a model could use a wartime workweek length to estimate the fraction of the continuing mission category that could be made available for, say, filling positions found to be short elsewhere.

Early in 2001, there was no official policy about how to handle untasked forces when the requirements goal is to meet some scenario short of two MTWs. The methodology we present allows the requirements model to exclude untasked forces from the requirements or to keep part of them, according to whatever policy the Air Force may present. Retaining forward-presence forces is an

[2] The Air Force has other ongoing processes that estimate peacetime requirements from first principles, such as those using manpower standards.

example of a possible policy statement. We feel that the proposed methodology is flexible enough to accommodate some other requirements policy statements.

When merging MDS and TPFDD positions into the overall requirements, avoiding double-counting hinges on consistent assignment of positions from the two files to appropriate BIM categories. Our proposed methodology extends the BIM classification to the TPFDD demands to deal with this potential problem. Our approach to assigning MDS and TPFDD positions to BIM categories achieves consistency by taking the organizational hierarchy implied by each unit's Personnel Accounting Symbol (PAS) and parent PAS codes into account. (See pp. 22–29.)

BIM-R pays special attention to the Reserve and Guard in an MTW-sized scenario where a full Reserve and Guard call-up occurs. For example, the BIM-R approach takes the peacetime part-timers' workload into account in determining how to meet the home-station workload in wartime. (See pp. 34–35.)

The excluded triangle in Figure S.1 is a first-order approximation. The proposed approach does not adjust other, related parts of the system, such as wholesale logistics (depots) and training.

Estimates Using the Proposed Methodology

The proposed methodology allowed us to estimate requirements for a variety of scenarios, including one for two MTWs and some for less-demanding scenarios. To demonstrate the methodology, we considered one-MTW scenarios (derived from the TFA two-MTW scenario), some small-scale contingency scenarios (as exemplified by vignettes), and the TFA two-MTW scenario itself. We then compared and analyzed the resulting requirements. In particular, it is possible to compare our results for the TFA's two-MTW scenario with the actual TFA results and to analyze their differences. (See pp. 42–48.)

We also performed one illustrative assessment under the "peacetime" EAF environment, in which most Reserve and Guard forces are part-timers. In this instance, we did not estimate requirements but, instead, used a capabilities-based Air Force view to check the adequacy of the two-MTW-based force structure for the peacetime EAF. This was an interesting case because, unlike the MTW scenarios we used for estimating requirements, the peacetime EAF is designed to function without a reserve call-up.

We compared manpower authorizations with actual personnel demand data to see whether the former were sufficient to satisfy the latter, by specialty and skill

level. We were particularly interested in determining whether authorizations were sufficient to meet demand without exceeding corresponding deployment tour length limits for active or reserve personnel.

We found that, within the sample of specialties and skill levels we examined, the EAF authorizations could meet the great majority of demands within personnel tour length limits, even at peak demand. These authorizations failed to meet only a small percentage of the demands, inside or outside tour length limits. Thus, given the planning assumptions at the time, authorizations appear to have been adequate for meeting peacetime demand in the pre–September 2001 environment, although scheduling manpower resources may have presented some challenges. (See pp. 54–57.)

While analyzing requirements under the AEF, we noticed that there was no Air Force–wide policy on home-station workweek length, in contrast to MTW wartime planning, for which there is such a policy. A workweek length policy is necessary for estimating home-station requirements under AEF.

Lessons Learned from TFA-I and Suggestions for a Future TFA

Having familiarized ourselves with the TFA-I models, data, and process during our methodology development, we are able to offer some suggestions for a future TFA-like requirements exercise. We identified some important potential pitfalls in both the methodology and process TFA-I followed. There are indications in the TFA data that some of these potential pitfalls actually materialized in the TFA results. (See Appendix A.)

In the TFA-I methodology, the most serious potential pitfalls are related to double-counting in the merging of the MDS and the TPFDD to obtain the overall requirements. Our revised BIM classification methodology and our methodology in assembling requirements address these issues. (See pp. 22–29 and pp. 15–16.) We also suggest fully specifying the merge step's logic to allow greater degree of automation of the merge process. Additional automation would also provide the ability to fix merging errors quickly, as they are identified.

We suggest that the Air Force undertake a continuous effort to develop requirements-assessment and estimation models apart from those of TFA-like exercises. The short deadlines of TFA-like exercises make it impossible to develop a requirements methodology that can consider the various changes affecting the Air Force. It is likewise impossible to develop a methodology under such circumstances that would be adequate for considering alternative

requirements policy options. Such an ongoing model development and assessment effort would allow a future TFA-like exercise to borrow the appropriate methodology for representing the requirements policies of interest, and reducing its model development and testing time.

The remaining observations have to do more with the TFA process. Given that one of the TFA goals was for its results to influence the program objectives memoranda, a new TFA-like process needs to have a more-careful set of controls, including quality controls. First, we suggest designating an organization to oversee quality control of the results and how they are used within the Air Force. The TFA-I process was geographically distributed in that it required that inputs be provided and a model (BIM) be run at the major commands (MAJCOMs) by the functional area managers (FAMs). A distributed process is inherently more difficult to control. The outcome of TFA-I was too sensitive to the varying degrees of success in communicating its goals and training its participants. The MAJCOM FAMs had wide authority to set support requirements levels, and there were few checks and balances. What incentives or disincentives did the FAMs have? Where were the accountability and auditing trails? We suggest providing incentives to the FAMs and MAJCOMs to encourage more efficient trade-offs of the manpower resources.

As one way to provide more controls, we suggest making the BIM classification process more extensive and methodical. A handful of manpower experts, fully accountable (as in our proposed methodology) at a central location would make an initial, default assignment of positions to BIM categories before the MAJCOM FAMs had the opportunity to revise or use them. FAMs would have to justify any overrides of the resulting defaults by producing appropriate documentation (and thus providing an auditing trail). We also suggest designing a mechanism for encouraging efficient resource trade-offs, such as setting upper bounds on budgets, on a functional or MAJCOM basis. Overall, we encourage developing more feedback summary reports throughout the process at the Air Force, MAJCOM, and functional levels to help identify and correct problems while the TFA-like process is in progress.