Chapter One
INTRODUCTION

The September 11 attacks and the 2001 Quadrennial Defense Review (QDR) have led the Department of Defense (DoD) leadership to change its terms of reference for sizing its force. Specifically, this approach has shifted from fighting two overlapping major theater wars (MTWs) in Northeast and Southwest Asia to one of (1) defending the United States; (2) swiftly defeating aggression in overlapping major conflict while preserving the option to call for a decisive victory in one of those conflicts; and (3) conducting a limited number of smaller-scale contingency operations.\(^1\) Although the new force planning is still being studied, it has become clear that the objectives of U.S. peacetime air mobility operations—to meet peacetime demand and maintain wartime readiness—will remain unchanged.\(^2\)

The ideal intensity of peacetime operations lies between a level that is not too high to stress personnel and aircraft and one that is not so low as to provide insufficient flying for pilot training. However, there is an inherent ambiguity in the terms *peacetime* and *wartime*. For the purpose of this study, we define peacetime as periods in which the overall air mobility demand is low. This occurs when there is no major conflict and/or there are no smaller-scale contingencies that together demand high-mobility support. Conversely, we define wartime as periods in which the mobility demand is higher than that in peacetime. During wartime, the United States would be involved in a major conflict and/or one or more smaller-scale contingencies that together would call for high-mobility support. We set the peacetime/wartime demarcation at the intensity level of Operation Enduring Freedom (OEF), at or above which the period is considered wartime.\(^3\)


\(^{2}\)“Wartime readiness” means that the United States has sufficient personnel and assets to serve and meet wartime requirements.

\(^{3}\)In contrast, although the Kosovo air war is considered by some—especially many at the Air Combat Command—to be another MTW, we consider it peacetime as far as air mobility activities
Today’s adversaries, although much less potent than the former Soviet Union, are more prone to take hostile action against U.S. interests. Such actions led to Operation Desert Shield/Desert Storm during 1990–1991 and to subsequent U.S. involvement in Iraq and elsewhere.\textsuperscript{4} The heightened intensity and frequency of U.S. peacetime missions in the 1990s have been well recognized. During FY 2000 and FY 2001, however, the Air Mobility Command (AMC) faced a problem that had not appeared in recent years: its air mobility activities were reduced to such an extent that its flying hours were no longer sufficient to satisfy copilots’ aging requirement.\textsuperscript{5,6} Like any sizable contingency in the past, OEF has eliminated this flying-hour shortage. When OEF ends, however, such a shortage is likely to recur from time to time. AMC thus needs to develop the flexibility to meet fluctuating demand, both high and low, without sacrificing training and readiness. Indeed, gaining flexibility is consistent with the 2001 QDR’s new “basis of defense planning from a ‘threat-based’ model that has dominated thinking in the past to a ‘capabilities-based’ model for the future.”\textsuperscript{7}

Because the United States cannot predict when and how often war might occur, it is important to have the flexibility to meet fluctuating demand.

\textsuperscript{4}Generally, whether a year is fiscal or calendar will be made evident in this report. Where neither is specified, fiscal year is intended.

\textsuperscript{5}When the international situation is relative calm, U.S. involvement is reduced (a situation that the U.S. government strives to achieve). In addition, there is increased competition from commercial carriers for AMC business.

\textsuperscript{6}AMC expects a CP of a particular aircraft type to fly, on average, a specific number of hours per month. This “aging rate” allows CPs to be promoted to a higher rank within a reasonable time. While aircraft commanders (ACs) are also expected to fly a certain number of hours to maintain flying proficiency, those hours are in the teens per month and are far below the aging rate for CPs. ACs have little problem attaining this proficiency rate. In this report, we call these rates the \textit{aging requirement} for CPs and the \textit{proficiency requirement} for ACs. Both are expectations and planning factors that are designed to allow pilots to be promoted on time and maintain flying currency.

This study focuses on pilots who fly full time—i.e., those for whom flying as opposed to working behind a desk is their principal duty. Full-time pilots are classified into two categories. An AC is a pilot who can serve as the ranking officer of the aircrew. A CP is not qualified to command a flight and must be accompanied by an AC on a flight. The category of AC includes three crew positions: aircraft commander, instructor pilot, and flight examiner. The category of CP includes copilot and first pilot. That a category and a crew position have the same name can be confusing. Because these names are already in common use in the military, however, we decided not to introduce new names for the two categories. To reduce confusion, we use the terms \textit{CP} and \textit{AC} to refer to their respective categories in this report. In the rare occasions when these terms are used to represent crew positions, we will explicitly indicate as such.

ISSUES EXAMINED

This study compares the peacetime tempo of air mobility operations in the Cold War (1980s) and post–Cold War (1990s) periods\(^8\) and examines the factors and associated trends that can affect AMC’s ability to meet these dual objectives cost-effectively. The study does not, however, examine whether AMC has enough manpower and hardware to meet its wartime and peacetime missions. Rather, it seeks to ascertain whether AMC has the flexibility to generate enough flying hours for pilot training when flying demand is low. Can AMC man flying operations with the number of pilots authorized by Congress? How well does the actual ratio of copilots (CPs) to aircraft commanders (ACs) match what is authorized? Comparing peacetime operations in the 1980s with those of the 1990s, did pilots get less hands-on training during flights in the latter period? Was AMC less able to project airlift demand accurately in the latter than in the former period? Did AMC have to fly more missions with shorter advance notice? Has AMC been successful in using reimbursements from its customers to defray its operating expenses?

This study uses a number of measures to identify potential problems. In Chapter Two, we analyze whether the flying hours of key organic (AMC-owned)\(^9\) assets (the C-5, C-141, C-17, C-130, KC-135, and KC-10) have been increasing since 1981. The C-5, C-141, and C-17 are AMC’s strategic airlifters, while the C-130 is its tactical airlifter. The KC-135 and KC-10 constitute AMC’s tanker force.\(^10\) Organic aircraft fly much less often than do commercial aircraft. Some increased flying would not overstress the aircraft but would imply higher expenses in returning aircraft to their wartime readiness status. We also examine the flying hours per pilot of a given aircraft type and study whether there is any shortage in flying hours for pilot training.

In Chapter Three, we examine the mix of CPs and ACs who are flying full time at AMC. We first determine whether AMC is able to man flying operations with

---

\(^8\)The peacetime period in the 1990s does not include the Gulf-War–affected years, FY 1990 and FY 1991, or 1994, a unique year in which many C-141s were grounded because of possible weep-hole cracks in their wings. This grounding is described in Chapter Two.

\(^9\)“Organic” means “AMC owned.” Organic assets are AMC-owned assets, and organic flying hours are flying hours flown on AMC-owned assets.

\(^10\)The KC-135, a military version of the Boeing 707, is used to refuel aircraft while in flight. A small number of KC-135s have been modified to carry some 10 tons of cargo apiece. The KC-10 is a military version of the DC-10. Although it was designed as a tanker, DoD plans to use some of them to carry about 40 tons of standard-size pallets of cargo in the event of a conflict. See Congressional Budget Office, *Moving U.S. Forces: Options for Strategic Mobility*, Washington, D.C., February 1997, pp. 12–13. Unlike military cargo aircraft such as the C-5, C-141, C-17, and C-130, KC-135 and KC-10 tankers are modified versions of civil aircraft: They have low wings, and their cargo doors are higher off the ground. In addition, special elevators are required for loading and unloading. These aircraft are, however, cheaper per copy because both they and their civil counterparts are produced in large quantities.
the number of pilots authorized by Congress. If the actual number of CPs and ACs exceeds those authorized by Congress, should that number be reduced?

We then compare the actual CP/AC ratio with that authorized. If the actual ratio is greater than the authorized ratio, there may be too many CPs relative to ACs. Alternatively, there may not be enough ACs to command all aircraft, since every flight requires at least one AC. On the other hand, if the actual ratio is less than that authorized, there may be too few CPs relative to ACs—or there may be flights with more than one AC, which would involve more salary cost because ACs earn a higher average salary than do CPs. At the same time, an AC can fly significantly less than a CP and still meet his proficiency requirement. We will show that this flying-cost savings can easily outstrip the higher salary cost involved such that having relatively more ACs than CPs can be less expensive to maintain in an environment in which flying-hour shortages occur frequently.

In Chapter Four, we analyze whether pilots are spending less time piloting. During a flight, all working pilots in an aircraft can credit the hours of the flight toward their aging and proficiency requirements. However, it would be valuable to distinguish piloting hours (in which an individual is in a pilot seat piloting the aircraft) from observing hours (in which an individual is simply observing others piloting and is not in a pilot seat). Training experience is superior when it consists of more piloting hours and fewer observing hours.

AMC schedules all pilots and aircraft types to fly a given number of hours each year. In Chapter Five, we study the deviation of the actual flying of aircraft and pilots from that scheduled. The greater the deviation, the more difficult and costly it will be to change the flight schedule and the greater the effect will be of short-notice changes on pilots’ quality of life.

Chapter Six examines whether commercial air carriers are capturing an increasing share of AMC customers’ airlift business. In periods of flying-hour shortages, AMC may want to retain more airlift missions in house and contract fewer flying hours to commercial carriers.

Chapter Seven summarizes the potential problems identified in Chapters Two through Six. Finally, in Chapter Eight, we suggest solutions.

DATA SOURCES

Two sources can be used to provide data for analyzing the issues above. The Air Mobility Performance Analysis System (AMPAS) obtains data from command posts worldwide. Pilots report flight data to a command post when they land at an airfield. There are three reasons we do not use this source for our analyses. First, 1980s data are no longer available, and we wish to compare the operations
tempo (OPTEMPO) in the 1990s (the post–Cold War era) to the 1980s (the Cold War era). Second, the all-important Flying-Hour Program statistics are not derived from these data, although official documents such as AMC’s annual *Command Data Book* rely heavily on numbers in the program. Thus, using AMPAS would mean using data that are not necessarily consistent with these authoritative documents. Third, the AMPAS data seem to have errors and inconsistencies, such as flying hours that are obviously far too numerous even for a fully fueled aircraft and negative flying hours documented for certain flights. Moreover, if a tanker (a KC-135 or KC-10) is to be in the theater for a long time, the control of the aircraft may be transferred to the field commander, and the flying hours in the theater will not be recorded in AMPAS. This could result in a significant underestimation of the flying hours for these aircraft.

An alternative data source is the Reliability Maintenance Information System (REMIS), which collects flight data from pilots’ Form 781. Official flying hours, including those that appear in the *Command Data Book*, are based on REMIS data. A comparison of OPTEMPO in the Cold War and post–Cold War periods was feasible because we could access data from 1981 forward. We did not find any significant errors in the flying-hour data derived from REMIS, and, as expected, the flying-hour data are very similar to those in the authoritative annual *Command Data Book*. For these reasons, we chose REMIS over AMPAS as the data source for this study. In subsequent chapters, we will describe additional data used in specific analyses. When different sources of data were available, we selected the data that appeared in official AMC documents or that were directly provided by AMC offices.

For the figures and tables in this study, we used data at least as late as FY 1999 and, for many, FY 2000. For the most important ones, we obtained data that included all of FY 2001 and the first four months of FY 2002.