Chapter Eight

SUGGESTED CORRECTIVE MEASURES FOR IDENTIFIED PROBLEMS

In previous chapters, we identified potential problems AMC faces in managing its peacetime air mobility operations. These problems can also affect wartime operations by hindering AMC’s readiness and by discouraging its commercial partners from participating in CRAF. In this chapter, we suggest corrective measures to alleviate the problems that have previously been identified. We first address AMC’s recurring flying-hour shortage and loss of revenue. We then deal with other problems.

DEALING WITH THE RECURRING FLYING-HOUR SHORTAGE AND REVENUE LOSS

The most serious problem thus far identified is that AMC pilots will from time to time have insufficient flying hours with which to meet their aging and proficiency requirements. Thus, we first suggest measures that can address this issue when it recurs. These measures should be flexible and even reversible because peacetime demand can also be high and may overstress AMC’s ability both to meet such demand and to maintain wartime readiness. We will therefore expand our discussion on how AMC can use airlift capability in the commercial sector to smooth the intensity of its peacetime operations by contracting out more flying hours when overall airlift demand from the military is high and by withholding more when demand is low.

We will discuss measures to eliminate the recurring flying-hour shortage before we describe those intended to resolve the often-associated problem of loss of revenue. This is because once flying hours become sufficient, other problems—including loss of revenue—become easier to resolve. First, however, we must review the measures AMC has implemented to correct the flying-hour shortage.
Offer Measures Beyond Those Taken by AMC

AMC has taken a number of steps to deal with insufficient flying hours. First, AMC cut $89 million$ from its international cargo buy for FY 2001, thereby reducing the flying hours diverted to commercial air carriers (see Figure 8.1). However, this action was insufficient to eliminate the shortfall during FY 2001.

Second, to alleviate the flying-hour shortage for C-130 CPs, AMC has been considering the possibility of reducing the aging requirement from 29 hours to 24 or 25 hours per month and the total hours required for promotion to AC from 1000 hours to 900 hours. However, AMC needs to show that this requirement can be reduced without affecting training.

Third, AMC decided not to correct the flying-hour shortage for C-141 CPs, because C-141s are being retired. There is, however, a problem associated with

---

1The actual reduction during FY 2001 was $77 million. In September 2001, however, the cargo buy was $12 million above normal because of post-September 11 activities. Thus, the cut would have been $89 million without those activities. We are interested in the adequacy of flying hours for pilot training during peacetime operations. In other words, without relying on contingencies such as OEF, how much cargo buy would have to be cut in order to retain sufficient flying hours for organic pilots?
this approach. Because C-141 pilots will be transferred to fly other aircraft such as C-17s their earned flying hours will count toward their requirement for promotion regardless of the aircraft to which they are assigned. Thus, reducing CP flying will delay CPs’ promotion to AC. In any case, AMC needs to show that reducing flying hours will still allow for adequate training and will not affect flight safety both in the C-141 and, later, in other aircraft types.

Fourth, AMC has planned to eliminate insufficient flying hours for CPs of C-5s and C-17s by flying channel cargo missions more frequently and with lighter payloads. We estimated, however, that the extra cost involved in sustaining this approach would be approximately $70 million a year. We also suggest that less expensive methods be used to reduce the flying-hour shortage. One might argue that $70 million is only about 1 percent of AMC’s annual budget—a negligible amount considering that its total authority for FY 1999 was $6.2 billion. We disagree for several reasons, the first of which is that $70 million annually in absolute terms is not a small sum. In addition, the extra expense involved solves the flying-hour shortage only for C-5 and C-17 CPs and amounts to 11 percent of the flying-hour cost of C-5s and C-17s—a sum that is not insignificant. Moreover, if AMC used the approach of flying more frequently and with lighter payloads to eliminate the flying-hour shortage as a whole, it would incur an additional annual cost of $144 million for generating enough flying hours for the CPs of its other airlifters (the C-141s and C-130s) and tankers (the KC-135s and KC-10s). Flying empty also projects a wasteful image, particularly if there are cheaper ways to address the shortage. Finally, in today’s era, the flying-hour shortage can at times be much worse than those in FY 2000 and FY 2001. Flying more frequently and with lesser payloads is thus a costly solution.

Fifth, when the flight crew planned consists of two ACs and one CP, AMC has encouraged wing commanders to replace the second AC with a CP. As shown

---

2As of March 31, 2001, we projected that C-17 CPs would be 8700 hours short and C-5 CPs, 3100 short for the full fiscal year of 2001 if AMC were to fly the organic aircraft as much during the second half as in the first half of the fiscal year. We multiplied these hours by the corresponding variable costs per CP flying hour to obtain the figure of $70 million. In reality, AMC was willing to incur extra expenses in flying C-17s and C-5s more frequently and with lighter loads during the second half of FY 2001, reducing C-17 CPs to 4300 hours short in flying and C-5 CPs to 1400 hours short. Eliminating the remaining shortage during FY 2001 would cost $34 million. However, the total cost to eliminate the shortage by flying more with lesser payloads would be $70 million a year at a peacetime demand level of FY 2001 (without factoring in the September 11 attacks and their aftermath).

3These methods will be discussed in subsequent sections.

4We used the same methodology as that for the C-17 and C-5. In FY 2001, the actual shortages were reduced somewhat to 2000 hours for C-141 CPs, 19,000 for C-130 CPs, 2000 for KC-135 CPs, and 4500 for KC-10 CPs. The cost to eliminate the remaining shortage by flying more would be $125 million.

5AMC sent a bulletin to wing commanders in October 2000 to encourage them to adopt this measure as a way to reduce CPs’ flying-hour shortage.
in Figures 4.1 to 4.3, the average number of pilots in a flight for a strategic airlifter (the C-5, C-141, and C-17) during the second half of the 1990s was 3.0 with 1.5 or more ACs. This implies that 50 percent of these flights would have two ACs in their aircrew. Replacing the second AC with a CP can thus generate many flying hours for CPs. However, wing commanders have other considerations in deciding whether to apply this measure. For example, wing commanders still consider C-17s to be new and C-17 CPs inexperienced. Moreover, a C-17 flight crew has neither a flight engineer nor a navigator. Therefore, even when the aircrew consists of three pilots, one more than the minimum, the combination of one AC and two CPs would be too risky for many missions. Moreover, wing commanders have already used only one AC and two CPs in about half of the C-17 flying hours and cannot increase that number much higher. Even for C-5s and C-141s, wing commanders prefer to have two ACs in the aircrew to handle complex missions despite the fact that there are two flight engineers on board. We believe that replacing the second AC with a CP is an attractive corrective measure that should be used whenever it does not affect flight safety.

Sixth, AMC has developed a new initiative, Channel Door to Door (CD2) or CAT B+,6 in which AMC retains the option to use its airlifters for the flying segment between its APOEs and APODs. For the ground segment, AMC contracts CRAF participants to deliver cargo to the APOE and to send cargo from the APOD to the final destination. The aim of CD2 is to allow AMC to fly more whenever it needs to do so in order to meet its pilot training requirement. On the other hand, when the demand on AMC is high, it can use the Commercial Air Line of Communications (COMALOC) as a shock absorber to assume more deliveries. CD2 also attempts to be competitive with COMALOC in price and service quality. We support development of this program because it will give AMC more flexibility with which to meet fluctuating demand. The program commenced on October 1, 2001, and was expected to replace $10 million (or one-fifth) of all COMALOC buys during FY 2002.7

6Category B is a delivery service contracted for the full planeload, while Category A pertains to less than a full planeload. Traditionally, the commercial air carriers can provide service for both full and partial planeloads with door-to-door service while AMC cannot. CAT B+ takes advantage of both military airlift and commercial ground transportation to deliver less-than-full planeloads door to door.

7See Air Committee Update, Air Mobility Command, June 2001. Category A (commercial), which is carried through COMALOC, was estimated at $47 million. AMC wanted to transition part of these shipments to Germany and Korea to CD2 during FY 2002 and estimated the CD2 workload to be 22 percent of that of COMALOC during FY 2001. Assuming that the dollar value is proportional to workload, we arrived at $10 million for CD2.
In addition to CD2, AMC has been attempting to fold many of its air cargo tenders into the Military Air Line of Communications (MILALOC). While a tender is not under TWCF, a MILALOC is. Commercial international tenders account for $25 million to $30 million per year, and retaining any part of those funds through MILALOC will result in more flying and revenue to AMC. On the other hand, to eliminate an annual organic flying-hour shortage of the size that appeared during FY 2000 and FY 2001, AMC would need to reduce commercial buys by an estimated $90 million, as indicated in Figure 8.1. CD2 and cutbacks in tenders, while beneficial and worthy of development, are insufficient to the task of eliminating the shortage.

Worse, the shortage may become even more severe from time to time because AMC will have more pilots. Moreover, although AMC has taken measures to alleviate the flying-hour shortage, such measures can be expensive and, even when combined, are insufficient to resolve a severe shortage. We thus suggest that additional measures be implemented to help alleviate potential shortages.

**Further Reduce the International Cargo Buy**

In this section, we suggest corrective measures that can be immediately implemented to deal with the flying-hour shortage for CPs and with revenue loss. Measures that require a longer lead time before they can be implemented, as well as immediate and long-term measures to deal with problems other than these, are suggested in the section that follows.

Instead of flying with lighter payloads, AMC should further reduce its international cargo buys for channel and other missions. We suggest that AMC cut its international as opposed to domestic airlift buy. AMC seldom conducts domestic flights in any case. When substituting for commercial aircraft and airlift, organic strategic airlifters are more cost-effective in delivering cargo over a long distance and can generate more flying hours through international flights than through domestic flights. The international cargo buy—especially its expansion buy—has long been used as a flying-hour reservoir to provide additional flying hours to AMC pilots when needed. For the full fiscal year of 2001, AMC cut its international cargo buy by $77 million and retained the flying hours for organic aircraft. In fact, without factoring in post–September 11 activities, we estimated that the cut would have been $12 million higher, or $89 million.

---

8Private communications with John Folkeson, RAND, March 11, 2002.
9See the section on insufficient flying hours in this chapter.
10The buy during September 2001 was $14.3 million, as opposed to $2.5 million during August. In other words, without the September 11 attacks, the buy would have been $12 million lower.
Because AMC cannot rely on any contingency to supply the needed flying hours, the question is, Without the September 11 attacks and without flying organic airlift with lighter loads, how many flying hours would AMC fall short during FY 2001? We estimated that just for the CPs of C-5s and C-17s, AMC would be short 11,800 hours, or 13 percent of its annual flying hours (in FY 2000). To eliminate the shortage for C-5 and C-17 CPs alone for a future year whose airlift demand is similar to that of FY 2001 (without September 11), AMC would need to cut $90 million from its already-reduced FY 2001 commercial cargo buy (see Figure 8.1). During FY 2001, the expansion buy was cut to merely $24.9 million from more than $100 million a year. It is unlikely to be cut much lower because even when airlift demand is generally low during the year, there are periods in which organic assets are overloaded and last-minute help from commercial carriers is needed. In such cases, the $90 million cut would have to come from the fixed buy and would amount to cutting that buy from $173 million to $83 million, or by half.11

Cutting the commercial buy can be less expensive than flying organic assets with lesser payloads. To demonstrate this, we need to compare the costs of the two alternatives. Alternative 1 involves flying organic assets more frequently but with lesser loads to generate additional flying hours for AMC pilots. This alternative amounts to flying organic assets by \( N \) additional hours without canceling any commercial buy to compensate. In terms of marginal cost involved in flying these extra \( N \) hours, it makes little difference whether AMC flies such hours with no cargo/passengers or with cargo/passengers diverted from originally planned organic flights.12 Therefore, for the purpose of discussion, we assume that AMC flies those \( N \) hours empty in Alternative 1.

Alternative 2 is the same as Alternative 1 in that the organic assets are intended to fly the same additional \( N \) hours to reduce the flying-hour shortage by the same amount. The difference is that in Alternative 2, the \( N \) hours will be flown carrying as much cargo and passengers as the organic assets would allow. To further elaborate on this alternative, let this load be \( L \). AMC is also planning to reduce its commercial buy by load \( L \) so that its organic and commercial assets together carry the same total load of cargo and passengers as before. There are two differences in marginal cost for the two alternatives. First, flying organic assets for \( N \) extra hours in Alternative 1 consumes less fuel than does Alternative 2 because an aircraft without a payload is lighter than one with a

\[11\text{If AMC does not want to cut its fixed buy, we suggest that it cut its passenger expansion buy. See the next section for more information.}\]
\[12\text{The latter spreads the cargo and passengers of originally planned trips into more trips, each with a lighter load. This can be an attractive approach if it is being implemented to make deliveries more timely. On the other hand, if the reason it is being implemented is to generate more flying hours for AMC pilots, as is shown here, spreading is not the least-cost alternative.}\]
Suggested Corrective Measures for Identified Problems

By examining two extreme and opposite cases, we will show that reducing the commercial buy is less expensive than flying empty for both cases. In Case 1, we assume that in recent years CRAF participants have gained more business and profits and that their incentives to join CRAF have increased. We further assume that these increased incentives are only partially canceled by the reduction in the annual commercial buy of load $L$. In this case, Alternative 2 is obviously less expensive than Alternative 1 because the former can save the fee that would otherwise have been paid to commercial carriers for delivering load $L$. This savings is far greater than the first cost differential, the fuel cost increment in carrying a load as opposed to no load.

In Case 2, the other extreme holds. A reduction in the annual commercial buy of load $L$ will make incentives for CRAF participation no longer adequate because existing incentives were barely sufficient before the cut. AMC must then compensate the commercial carriers so that their profit is the same whether they deliver load $L$ or not. The original fee that was to be paid to the commercial carriers for carrying load $L$ can be divided into three components: avoidable variable cost, unavoidable variable cost, and profit. To make the commercial carriers indifferent to Alternatives 1 and 2 in terms of profit and incentives, AMC need only pay those carriers the last two components but not the first. For example, the fuel cost in flying load $L$ belongs to the avoidable variable cost. The aging and depreciation of the aircraft caused by the additional flights for the delivery of load $L$ are also part of the avoidable variable cost. Part of the flight-crew cost in flying the aircraft and of the labor and material cost in servicing these aircraft during and after their flights to bring them back to preflight conditions can also be avoidable cost. It is now clear that the avoidable variable cost is a significant fraction of the fee and that the unavoidable variable cost and the profit combined are still considerably smaller than the fee.

---

13 This is a possible case. The annual value of commercial augmentation in constant 1999 dollars during peacetime (excluding 1990–1991 and 1994) has increased 11 percent between 1981 and 1999. Moreover, there are a host of new businesses in which only CRAF members can participate. These businesses include the $1.5 billion City Pairs Program for federal government passengers’ domestic and international air travel; the Express Small Package Program for domestic air delivery; and WWX. There are also tenders, DVD, and Premium Service. (See Chapter Six for details on these businesses.) Although through the years CRAF has been required to provide an increasing airlift capability, we believe it is quite possible that the incentives for CRAF participation would remain sufficient even following the reduction of the commercial buy for load $L$.

14 One can argue that canceling the flights for load $L$ would not allow the commercial carriers to recoup all of the variable labor costs for the flight and ground crew because this crew would already have been hired and scheduled to fly and service those flights. However, placing a lower commercial buy before the start of a fiscal year instead of canceling at the last minute might give enough warning to commercial carriers of lower demand and help them avoid part of the variable labor cost.
In sum, the whole fee is paid to commercial carriers for carrying the additional load $L$ in Alternative 1, but only the unavoidable variable cost and profit need be paid in Alternative 2. Thus, Alternative 2 is less expensive in both extreme cases and is likely to be less costly in all other intermediate cases as well.

AMC should reduce its international cargo expansion and fixed buy from commercial carriers to compensate for the additional organic flying it needs. It should, however, estimate the overall incentives for CRAF participation to ensure that this reduction does not exceed recent incentive increases and does not lead to any CRAF withdrawal. Otherwise, AMC should pay commercial carriers a fraction of the fee that would have been charged for carrying load $L$ to compensate carriers for their loss of business in delivering load $L$. One plausible scheme is for AMC to pay commercial carriers their unavoidable variable costs and typical profits, but not their full fees, on those fixed buys that are canceled during the fiscal year. On the other hand, there will be no compensation to commercial carriers on expansion buys that are anticipated but do not materialize. Expansion buys are last-minute buys, and commercial carriers already know that AMC has no obligation to issue any or all of them.

In sum, whether paying none or a fraction of the fee, AMC will find this alternative less expensive than flying organic assets more frequently and with lesser loads.

**Add an Organic, Dedicated Passenger-Carrying Capability**

As shown in Figure 8.1, the international cargo buy, which has previously served as a flying-hour reservoir, can run low when AMC uses it to retain sufficient organic flying. Worse, circumstances can exacerbate the flying-hour shortage to the point at which even exhausting this reservoir will not suffice. For example, AMC has decided to buy 60 C-17s in addition to the 120 it has already authorized. These additional aircraft will likely necessitate more pilots and hence more flying hours during peacetime to keep those pilots trained. We suggest that AMC create another flying-hour reservoir from the international passenger buy.

The international passenger buy has remained at about $350 million a year in spite of severe cuts in the international cargo buy (see Figure 8.2). Table 8.1

---

15 This study does not suggest that a smaller number of additional C-17s should be acquired. The decision on C-17s is based on many factors. This study merely identifies the implications for flying hours during peacetime so that any negative ramifications can be corrected.

16 Like the international cargo buy, the international passenger buy is in CAT B, which is the buy for the full planeload.
shows that regardless of the mission type, the average number of passengers per trip is sizable, approaching 300. If the number were much smaller, AMC would have to fly frequent trips and incur high expenses in order to provide the same service in house. With so many trips of near-full planeloads, AMC has an opportunity to economically fly some of these trips when it needs more flying for pilot training. Unfortunately, AMC does not yet have an organic capability dedicated to carrying planeloads of passengers. Therefore, before the international passenger buy can be cut, AMC must develop an organic, dedicated pas-
senger-carrying capability so that its organic assets can deliver the passengers who were originally to be carried on commercial flights. Instead of acquiring passenger aircraft, AMC would find it much cheaper to obtain a conversion set that could convert an airlifter or a tanker from carrying cargo to carrying passengers exclusively. This set could be designed so that it could be installed and uninstalled quickly.

AMC has been considering the possibility of purchasing palletized seats for 34 C-17s and storing them for wartime use. Although these seats are currently not intended for peacetime applications, they should be thus designated, as their peacetime use does not preclude their use in war, and it would be most cost-effective to employ them at all times. In peacetime, such seats could generate much needed flying hours. In wartime, there would no longer be a lack of organic flying hours, so the seats could be used not for generating flying hours but rather for their originally intended wartime missions. With the palletized seats that AMC is considering, each C-17 could accommodate 134 passengers. We estimate that a conversion set based on these palletized seats, and with the addition of pallets for baggage storage and lavatories, would cost about $300,000. Moreover, because a 134-passenger capacity is well below 294, the average number of passengers carried per trip by the chartered commercial carriers (see Table 8.1), AMC should be able to replace some of these chartered flights with filled C-17s.

We also estimate that to eliminate the shortage of 8700 flying hours for C-17 CPs, a dozen C-17s would have to fly the same number of flying hours carrying passengers. The capital outlay for a dozen C-17 conversion sets would be only $3.6 million. AMC would then be able to reduce its international passenger buy by $50 million a year and fly those passengers with the organic converted passenger carriers. The income (revenue net of expenses) earned by AMC in just one year would exceed this $3.6 million outlay. Moreover, if AMC decided to buy palletized seats for 34 C-17s for other purposes but agreed to use a dozen of them to carry passengers during peacetime, the $3.6 million would be a sunk cost that should not be double-counted toward peacetime applications. In any case, the conversion would be cost-effective in that it

---

18The shortage was discussed earlier in this chapter.
19We do not suggest that AMC take back the bulk of the $350 million for the international passenger buys as shown in Figure 8.2 because AMC’s route structure is different from that of the commercial air carriers and cannot provide the same frequency of services. However, because Table 8.1 shows that these buys carry close to 300 passengers per trip regardless of the mission type, it would be quite feasible for AMC to retain $50 million or more of business for its organic flying.
would allow the strategic airlifters to generate both flying hours and revenue at the same time, as opposed to flying empty simply to generate flying hours.\textsuperscript{20}

We can improve the cost-effectiveness of these measures even further by advocating the use of KC-10s instead of C-17s as dedicated passenger carriers. Because C-17s are better suited than KC-10s to carrying cargo, it would be more efficient for AMC to retain C-17s for cargo-carrying purposes. Moreover, KC-10s have a larger capacity for carrying passengers than do C-17s. The KC-10 is derived from the DC-10, a passenger carrier. Its wings are at the bottom, and the floor level where seats are installed is closer to the diameter of the fuselage and is thus wider, thereby accommodating more seats abreast. The preliminary design of the KC-10 further indicates that it can seat over 200 passengers\textsuperscript{21}—more than the 134 accommodated by the current C-17 conversion design. However, a KC-10 conversion set could cost twice as much as that associated with the C-17 because an oxygen system might have to be installed in each seat and because there will be a higher cost for more palletized seats. However, even $600,000 is a small quantity compared with the annual revenue and income the KC-10 could generate.

KC-10s currently fly 5000 hours per year for cargo delivery. AMC should switch this cargo flying to C-17s and let KC-10s spend those 5000 hours carrying passengers instead. This switch would generate more revenue than would be the case if KC-10s were used to carry cargo and C-17s to carry passengers.

In an earlier study,\textsuperscript{22} we found that an organic, dedicated passenger-carrying capability is needed during wartime. Potential adversaries such as Iraq and North Korea can now attack airfields with chemical or biological weapons. Even conventional munitions carried by ballistic missiles or special operations forces can prevent CRAF aircraft from landing at airfields in the theater.\textsuperscript{23} After

\textsuperscript{20}For those who are concerned that AMC will not be able to economically retain $50 million worth of international passenger buy, we reiterate that AMC can convert a smaller number of C-17s for the smaller amount of traffic it projects. Because the conversion cost is proportional to the number of C-17s to be converted, the lower gain in anticipated business would not make the conversion uneconomical. It would, however, reduce the total amount of cost savings in the conversion.

\textsuperscript{21}The KC-10’s commercial counterpart, the DC-10, can carry up to 380 passengers. However, a converted KC-10 would carry less because KC-10s do not have cargo compartments in the bottom of the fuselage for passenger luggage and equipment; this space is taken instead by fuel tanks. Thus, some space in the converted KC-10 must be reserved for holding these items.

\textsuperscript{22}RAND October 2001 research.

\textsuperscript{23}For example, Major James Hanley found that “the U.S. currently does not provide adequate measures to defend all the airlift forces against man-portable surface-to-air missiles during humanitarian relief missions.” (See James Hanley, “Force Protection of Strategic Airlift Forces in the Operations Other than War Environment,” Fort Leavenworth, KS: School of Advanced Military Studies, United States Army Command and General Staff College, May 21, 1998, p. iii.) This study was done in 1995. Since then, the threat would only have increased. Moreover, the threat could also be much more severe in major contingencies as opposed to humanitarian missions.
the first Scud missiles were fired during the Gulf War, for example, several major commercial air carriers refused to permit flights into the area at night, when most of the Scud missile attacks occurred. The Scud attacks also caused volunteerism to drop in some companies. In some cases, management flew missions because fewer crew members were willing to fly into threatened airfields. During the Gulf War, 78 percent of all air cargo landed at five APODs. Because a disruption at even one or two APODs would have affected the war effort, APOD attacks are lucrative and are likely to be used in future contingencies.

CRAF, being unequipped and untrained for protection, might not be able or willing to land at airfields that are vulnerable to attacks. We have thus proposed a transload approach in which CRAF aircraft would stop at safe airfields closest to the theater. In the Korean contingency, with both South Korea and Japan under ballistic missile threat, the closest safe airfields suitable for massive strategic air mobility operations may be at Guam. Shuttling passengers between Guam and APODs in South Korea requires converted strategic, as opposed to tactical, airlifters or tankers. The cargo and passengers carried by CRAF would be reloaded at the transload airfields onto organic aircraft, which would continue onto threatened airfields in the theater. To fill this need, AMC would require dedicated, organic passenger-carrying aircraft, which it currently lacks. Moreover, civil aircraft were grounded immediately after September 11 terrorist attacks. If AMC had large, dedicated passenger-carrying aircraft, it could use them for urgent travel, including the delivery of rescue personnel. However, the key peacetime justification for such aircraft remains the need for a second flying-hour reservoir (in addition to the existing one based on carrying cargo). Thus, there are multiple wartime and peacetime justifications for developing a passenger-carrying capability.

Make Nonpaying Passengers Pay

Military service personnel and their dependents currently fly free on military flights and AMC-chartered commercial flights when empty seats are available. While we would not dispute the fact that filling empty seats is a much deserved fringe benefit for service personnel and their dependents, we believe that this

---


Suggested Corrective Measures for Identified Problems

benefit should be borne by the individual services, not solely by AMC. We would thus propose that nonpaying passengers be charged a fare of, say, $100 on average per one-way trip. If the services reimbursed their personnel and dependents, the load factor would be unchanged, and AMC would receive $24 million a year.\textsuperscript{27} Even if nonpaying passengers had to pay the fare themselves, the load factor would not be greatly affected, and the same $24 million could accrue to AMC because most of these flights are overseas trips for which the $100 fare is still a bargain. If the discounted seats were sold to nonmilitary government personnel as well, the load factor and revenue could further increase.

Moreover, a recent study reported that “there is a great deal of organic airlift capacity that is going unused while commanders are spending precious travel dollars to move their people on commercial flights.”\textsuperscript{28} AMC should adjust prices and communicate and negotiate with commanders and government customers for better utilization of the unused capacity.

Decide Whether to Allow AMC Limited Participation in Commercial Air Delivery

Traditionally, AMC has not been involved in commercial business. However, the need to conduct cost-effective air mobility operations for national security justifies AMC’s limited participation in the commercial air delivery of cargo and passengers.

AMC often flies organic assets partially or totally empty, particularly during return flights. It would help AMC financially if the command were allowed to deliver commercial cargo and passengers for a fee whenever its organic or chartered commercial flights were not full. Because of AMC’s route structure and service-quality considerations, we do not anticipate that the commercial airlift industry will lose much business to AMC. To ensure that this is the case, the U.S. government can set an upper limit on the amount of commercial business AMC can undertake. For example, $100 million or $200 million might be a suitable limit. This revenue, in conjunction with other corrective measures, could then be used to eliminate the flying-hour shortage.

AMC should examine its route structure and its competitiveness to determine where and how often it can offer commercial services on its existing flights. On the other hand, letting the military participate in commerce, even if highly re-

\textsuperscript{27}As shown in Figure 6.4, military flights carried 132,000 nonpaying passengers, and AMC-chartered commercial flights carried another 110,000, during FY 1999.

stricted, is a drastic step both politically and philosophically. We do not recommend such a program at this time. Rather, the government should estimate the program’s benefit and decide whether AMC should be allowed to participate in the commercial air delivery business in such a restricted manner.

**Competitively Price Organic Services**

Competitiveness requires that organic airlift services be priced appropriately against comparable commercial services and that organic services be run in a cost-effective manner so that these prices can be sustained without increasing subsidies to AMC. Staying competitive would have two key advantages. First, customers would have fewer incentives to bypass AMC and seek airlift services elsewhere. A stable customer base would help AMC generate enough flying hours for its own pilots. Second, even with competitive pricing, AMC would continue to incur an annual loss for its operations because it has large but legitimate “war readiness” costs that commercial air carriers do not. The change in this annual operating loss over time would become an effective measure of cost containment and quality improvement, with a reduction in annual loss pointing to more efficient operations. AMC needs such an objective measure to improve the cost-effectiveness of its operations.

Some might favor an opposite system, maintaining that the main purpose of owning organic assets and personnel is to allow AMC to provide airlift services to the military during crisis or war. This argument holds that the peacetime activities necessary for training and maintaining readiness prevent AMC from competing with commercial air carriers on the basis of price and quality. Consequently, if the choice of service is decided by free-market forces, AMC’s customers will prefer commercial over organic services, and AMC will lose business. If this argument were valid, we would suggest converting TWCF to a credit system. On the basis of historic usage and future trends, AMC would allocate each military customer credits for passenger and cargo delivery during a given fiscal year. These credits would expire within the fiscal year and would be nontransferable. Customers would then seek to use these credits for organic services before turning to commercial air carriers. AMC would be guaranteed a certain number of flying hours that would not vary from those planned and would use those hours for pilot training and aging purposes. The drawback of the credit system is its nonmarket mechanism. Although AMC would have full control of those flying hours, it would lose its best objective measure, the competitive airlift market, to assess how well it improves the cost-effectiveness of its operations.

---

29 The operating loss should be adjusted for changes beyond AMC’s control, such as higher “war readiness” costs due to higher wartime requirements.
air mobility operations. We therefore do not consider the credit system to be of long-term interest to AMC.

Let us now return to competitive pricing. The objective of AMC, as the executive agent for the air mobility forces, should be to meet peacetime demand and to maintain wartime readiness at the lowest cost to the U.S. government. When AMC uses commercial augmentation, it can often lower the cost of meeting demand but not necessarily the cost of maintaining readiness. For example, when commercial air carriers assume too many missions, AMC ends up creating extra nonreimbursable missions specifically for training purposes. The full cost of these training missions would be more than the partial cost of subsidizing corresponding reimbursable missions, which generate the same number of flying hours for training. A key question, then, is how to price the organic services.

The principle underlying the TWCF is for AMC “to finance the operating costs of the airlift services provided by AMC, which is reimbursed for such costs by authorized customers to whom airlift services are rendered.”\(^{30}\) Under this principle, cost reimbursement plays a central role in the pricing scheme for organic airlift services. TWCF planners were concerned from the start that its prices were too high to be competitive. Instead of simply setting market-competitive prices, however, they eliminated various cost components, such as military pay and of the acquisition and depreciation of property and capital equipment associated with the airlift,\(^{31}\) so that the reimbursable costs or the prices charged to AMC customers could be lower and thus competitive. Unfortunately, since its establishment in 1958, TWCF has had continuing difficulties in deciding which cost components to include for reimbursement as well as in setting prices so that it can break even on an annual basis. This breakeven approach has a problem in addition to the difficulty in hitting the breakeven point every year: When there is a choice between competitiveness and achieving the breakeven point, the latter wins. If AMC is not competitive, however, it can lose customers to commercial air carriers.\(^{32}\) This is one reason the commercial TWCF is increasing.

Fortunately, USTRANSCOM and the Defense Logistics Agency, in coordination with the military services, in February 2000 established the Strategic

---


\(^{32}\)Under the breakeven approach, AMC can still examine the trend, over the years, of whether more or fewer cost components are included and use the inclusion as a measure of its competitiveness. The fewer cost components that are included to break even, the less competitive AMC is.
Distribution Management Initiative (SDMI)—an effort that aims to improve DoD’s end-to-end distribution system by balancing customer service, cost, readiness, and sustainability. Early results have already shown significant reduction in customer wait time. The first SDMI pilot began in Europe in July 2000. The wait time for air delivery of sustainment cargo to Bosnia has been reduced from 15.0 days to 10.7 days, representing a 29 percent reduction. In addition, on April 16, 2001, USTRANSCOM began a test of shifting 17 pallets per week from commercial air service to military air for three locations in Germany: Baumholder, Kitzingen, and Schweinfurt. Early analysis indicated that the resulting wait time is matching and often beating commercial performance. USTRANSCOM has also “adjusted organic rates to mirror commercial practice.”

It is thus clear that USTRANSCOM is using commercial performance and prices as metrics and that the quality of its service can be improved significantly. We recommend, however, that USTRANSCOM and AMC go further along the lines suggested here.

For example, the desire to minimize subsidies and maximize reimbursements to organic services has led to different prices for different categories of customers. The per-hour rates for channel passengers, channel cargo, and special airlift are lowest for DoD users, intermediate for non-DoD other-U.S.-government users, and highest for non-U.S.-government users. The justification for charging different prices for the same service is to “comply with national policy to recover costs incurred when supporting non-DoD and non-U.S.-government activities.” A pricing scheme based on subsidy and cost recovery is not competitive pricing. When an organic service is priced higher than the market price, customers have an incentive to shun AMC and seek a commercial provider. There are already avenues for AMC customers to bypass AMC. When its services are priced lower, AMC receives less revenue to support its air mobility operations. AMC should charge all the customers the same price for the same service, and the price should be competitive.

When determining competitive prices for organic services that AMC wants to keep in house, AMC need not consider the cost of the service or the amount of

---


34Passenger and cargo channel rates can be found in U.S. Government Department of Defense (DoD) Airlift Rates, U.S. Government Non-Department of Defense (Non-DoD) Rate Tariffs, and Non-U.S. Government and FMS Tariffs, Scott Air Force Base, IL: Headquarters Air Mobility Command FMBT, October 17, 2000. Special airlift rates can be found in Charters—Special Assignment Airlift Missions (SAAMs), Joint Chiefs of Staff Exercises (JCSE), Contingencies for the Transportation Working Capital Fund (TWCF), and Non-TWCF Aircraft, Scott Air Force Base, IL: Headquarters Air Mobility Command/FMBT, October 17, 2000, and in the Command Data Book, November 1999, p. 78.

subsidy and should charge the market price for the same service, adjusted for the service quality differential. A competitive market-based pricing scheme\textsuperscript{36} has the advantage of clearly demonstrating the true worth of a particular peacetime organic service.

AMC may not want to compete in certain services and may seek instead to outsource such services to commercial providers when the costs of providing the services exceed the competitive prices it can charge. On the other hand, AMC should price certain airlift services competitively even if its reimbursements do not fully cover its marginal expenses. Offering certain services that afford valuable training experience with only partial reimbursement is better than arranging dedicated training missions without any reimbursement at all.

Competitive pricing also means that AMC can charge customers a much higher price to recoup the full cost (both fixed and variable) for unique and valuable services such as airlifting outsize cargo unsuited to commercial carriers. This is an avenue for increasing airlift revenue to AMC to support its operations.

AMC should charge a single competitive price for the same service, eliminating the price differential among the current three categories of customers: DoD, non-DoD U.S., and non-U.S. Otherwise, if one price is the competitive price, the other two cannot be. Charging more than the competitive price could drive customers away, and charging less results in less money flowing to AMC to support its operations.

To stay competitive, AMC should also lower prices for services that are inferior in terms of on-time delivery or passenger comfort. At the same time, however, lower prices will result in even lower revenue to AMC, and inferior services will drive customers away. Thus, lowering prices alone is not a viable strategy for remaining competitive. Recognizing the implications of poor services, AMC has started programs such as SDMI to improve service, and the results thus far have been promising. Both competitive pricing and competitive service are the goals for which AMC airlift operations should aim.

If AMC switches to a competitive pricing scheme, one should expect a one-time change, or even decline, of the TWCF flowing to AMC. This bookkeeping change will not, however, affect the total cost of AMC operations to the U.S. government. If the transition causes a decline in the TWCF, a compensating increase should be added to the O&M fund. The current trend is a declining TWCF share, but it should improve once the transition to competitive pricing is

\textsuperscript{36}Although AMC is not equipped to adjust its prices in near real time, it can use averaged market prices, adjusted for quality differentials, for airlift services that it wants to keep in house. By this means, customers would have much less incentive to bypass AMC and give airlift business to commercial air carriers.
complete. Such pricing should help keep customers from diverting business from AMC. In addition, the new pricing should give AMC a clearer picture of whether its service quality is improving and its costs are declining.

DEALING WITH PROBLEMS OTHER THAN THE FLYING-HOUR SHORTAGE AND REVENUE LOSS

The measures described above will not only alleviate the flying-hour shortage and revenue loss but also ease other problems, as described below.

Congress Should Allow AMC to Vary the Number of Authorized Pilots

We found that the total number of actual CPs for both airlifters (the C-5s, C-141s, C-17s, and C-130s) and tankers (the KC-135s and KC-10s) has exceeded the authorized number since 1986, exhibiting an upward trend. However, this deviation was greatly reduced in FY 2001. The actual number of CPs during FY 2001 exceeded the authorized number by only 49 out of a total of 948, and the number of ACs exceeded that authorized by 29 out of a total of 949. The salary savings that would result from eliminating these positions would be about $5.1 million per year. This is not a very large savings considering the havoc to morale that would result if these pilots were reassigned or laid off. Congress should thus allow AMC some flexibility in deviating from the number of pilots authorized as long as AMC makes compensatory adjustments in other budgetary items to keep its overall operational expenses within the bounds of congressional authorizations.

Congress Should Formally Allow AMC to Vary the Mix of Authorized Copilots and Aircraft Commanders

In FY 2001, the actual CP/AC ratios of the airlifters (the C-5s, C-141s, C-17s, and C-130s) were above the authorized ratios, while those of the tankers (the KC-135s and KC-10s) were below. Where the actual ratios of airlifters exceeded authorized ratios, reducing the ratios to those authorized would have amounted to replacing 66 CPs with ACs, in which case salary costs would have risen by $1 million. On the other hand, a CP is required to fly many more hours

---

37This amount was calculated on the basis of the following data: For CPs, the average grade is captain and the average duration of service is about six years; for ACs, the average grade is major and the average duration of service is 11 years. (See Command Data Book, November 1999, p. 49.) Further, the annual regular military compensation (basic pay, basic allowance for housing, and basic allowance for subsistence and the federal tax advantage on the tax-free allowance) would be $60,591 for an average CP and $75,227 for an AC. (See 2001 Uniformed Services Almanac, Falls Church, VA: Uniformed Services Almanac, Inc., 2001.)
per month than is an AC. When flying-hour shortages recur, replacing 66 CPs with ACs could significantly reduce the flying hours needed. The marginal flying cost for just one hour per month for 66 CPs would be $2.7 million, which would exceed the $1 million annual salary cost cited above. AMC thus has financial incentives to reduce the actual CP/AC ratios for airlifters to those authorized if flying-hour shortages recur often.

For tankers, whose actual ratios were below those authorized, the salary savings in making actual ratios the same as those authorized is equivalent to $800,000 a year. However, just one extra flying hour per month for all of the 55 additional CPs would amount to $2.1 million, which exceeds the salary savings of $800,000. Therefore, if AMC is allowed to keep the actual ratios for the tankers from equaling those authorized, it should not be tempted to replace ACs with CPs for the small salary savings. The added flying-hour requirement and cost for the switch from ACs to CPs would be much too high whenever a flying-hour shortage occurred.

Instead of generally not enforcing the authorized mix of CPs and ACs, Congress should formally allow AMC to vary the mix as long as the variation does not increase its total authorized operational expenses, including salaries and training. AMC is in a better position than Congress to optimize this mix.

**Flying-Hour Shortage Corrective Measures Would Increase Piloting During Training**

We have found an undesirable trend of less piloting during training. Once the suggested measures ensure that AMC has plentiful flying hours even during periods of low airlift demand, this problem can be resolved by reducing the number of pilots per flight so that each will have more opportunities to pilot as opposed to observing others piloting.

**Reduce and Adapt to Deviations from the Flying Plan**

During the 1990s, the actual flying hours for airlifters deviated increasingly from the flying plan. Making last-minute adjustments in the flight schedule can be difficult and costly for AMC in assembling needed aircraft and personnel in a hurry. Pilots’ quality of life can also be lowered by short-notice flights. This increased deviation was caused by the transition from the Cold War to the post–Cold War era, and thus it is quite possible that the trend will not continue. To

---

38To arrive at $2.7 million, we used the costs per aircraft flying hour for various airlifters appearing in the *Command Data Book*, November 1999, pp. 77–78. See also Chapter Three.
reduce the deviation, however, AMC should improve its projection capability to include a more frequent update of its flying plan. It can also reduce commercial fixed buys and increase commercial expansion buys in its plan for the fiscal year. When AMC is running short on flying hours during the fiscal year, it can reduce its expansion buys, which AMC has not yet issued, and thus fly more for the remainder of the year. Equally important, AMC should accept deviation as a viable means of training, as war can also come with short notice.

**Contract Out and Adapt to More Engagement Missions**

For airlifters, engagement missions, which are typically for short-notice small-scale contingencies, have accounted for an increasing share of organic flying hours. It is quite likely that this trend will level off, albeit at a higher share of engagement missions than that seen during the Cold War era. Again, a two-pronged approach, as suggested in the subsection above, should be used. First, AMC should improve its projection and use more commercial expansion, instead of fixed, buys. Second, AMC should see a larger number of engagement missions as opportunities to train for quick-response operations.

**Recommended Measures Would Increase Reimbursement for Training**

Competitive pricing and better services will help AMC retain customers and halt the decline in the reimbursable share of its operating and training expenses. Competitive pricing adjusted for service quality establishes clear goals for AMC to reduce costs and retain business. Moreover, once AMC makes equitable arrangements with commercial air carriers for reduced commercial buys when flying-hour shortages occur and uses its dedicated, passenger-carrying capability for new business, it can retain more reimbursable cargo and passenger business in house.

**TOWARD COST-EFFECTIVE AIR MOBILITY OPERATIONS**

Peacetime demand continues to exhibit wide fluctuation. Not only can demand be high, but it can also be too low to provide the necessary flying hours for pilot training. Moreover, the wartime requirement for air mobility is on the rise, generating more asymmetry in both wartime and peacetime demand. This asymmetry makes a flying-hour shortage even more likely, as a larger number of pilots needed for wartime will require more flying hours for training during peacetime. Although AMC has been taking action to gain flexibility in meeting fluctuating airlift demand during peacetime, we have proposed additional corrective measures for generating new business and more flying for AMC when shortages recur as well as for gaining flexibility in using and not using commer-
cial air carriers to smooth the demand for organic assets. These measures also include some that would make AMC services more competitive with the commercial services, thereby stemming the loss of business from AMC. These corrective measures should help AMC meet peacetime demand and maintain wartime readiness in a cost-effective manner.