



CIVIL RESERVE AIR FLEET – 60/40 RULE:
THE CASE FOR A REINSTATEMENT USING
BLOCK HOURS

GRADUATE RESEARCH PAPER

Todd E. McNeal, Major, USAF

AFIT/IMO/ENS/11-10

**DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY**

Wright-Patterson Air Force Base, Ohio

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GRADUATE RESEARCH PROJECT**

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Degree of Master of Science in Logistics

Todd E. McNeal, BA, MBA

Major, USAF

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Todd E. McNeal, BA, MBA

Major, USAF

Approved:

//SIGNED// _____

Pamela S. Donovan, Ph.D. (Advisor)

DATE

Abstract

The Civil Reserve Air Fleet (CRAF) provides critical airlift capability to the Department of Defense (DOD) during both peace and wartime. One limitation placed upon CRAF carriers is the 60/40 Rule, which states that commercial air carriers working for DOD can earn no more than 40% of their total revenue from DOD sources. This rule is sporadically applied and cumbersome. As airlift demands are projected to subside from present day to 2015, certain air carriers, notably charter carriers, will need to find other sources of business to maintain economic viability. To encourage this adjustment, the DOD should return to enforcing the 60/40 Rule based on Block Hours, which are the baseline of civil air operations, easily measurable, and maintain a common definition among air carriers, simplifying enforcement.

A Block Hour 60/40 Rule assumes that if a carrier is earning 60% or more of their block hours from non-DOD sources, economic balance can be implied. This is beneficial to the carriers as well because those severely in non-compliance with the Revenue 60/40 Rule, while possibly in non-compliance with a Block Hour 60/40 Rule, are less so, thereby allowing them more flexibility to rebalance their DOD to non-DOD economic balance.

Additionally, an evaluation of Block Hours can highlight possible CRAF surge limitations and can be used to simulate the effect upon remaining CRAF carriers should one (or more) cease operations, leading to potentially catastrophic consequences.

Dedication

To my family – what a crazy year! Thanks for your love & support & for putting off your book so I could write this one; kids thanks for being flexible! I love you all! I'm proud to be your husband and daddy!

Acknowledgments

First, I'd like to express my appreciation to Dr. Pam Donovan for her inputs, recommendations, feedback and direction. Her desire to see CRAF improvements is contagious. Good luck at UNT!

Second, I really appreciate Mr. Merle Lyman, HQ AMC/A3B, for his sponsorship of this research. He is an outstanding leader and mentor who lives the Air Force Core Values. I hope this research helps! Also, thanks to the entire A3BC team (LtCol Gourdine, Mr. Caslen, Mr. Asher, and Mr. Lyon) for providing insight, information, and explaining concepts to this simple researcher. Their daily interaction with our CRAF partners requires professionalism and understanding of both the DOD's and carrier's needs... which is a challenging balancing act, but they do it unmatched tenacity. Thanks also to the USTC/AQ team that answered multiple "I have one more question" emails from me.

Third, thanks to Mr. Don Anderson, HQ AMC/AA9 for doing the leg work on the GDSS2 data.

Finally, thanks to the air carriers who provided insight, answered questions, and support the DOD mission through their CRAF participation. We couldn't do it without you.

Todd E. McNeal

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CIVIL RESERVE AIR FLEET – 60/40 RULE:

THE CASE FOR A REINSTATEMENT USING BLOCK HOURS

I. Introduction

“The United States national airlift capability is provided from military and commercial air carrier resources. The national defense airlift objective is to ensure that military and civil airlift resources will be able to meet defense mobilization and deployment requirements in support of US defense and foreign policies. Military and commercial resources are equally important and interdependent in the fulfillment of this national objective.” (National Airlift Policy, 24 June 1987)(Reagan, 1987)

Background, Motivation, & Problem Statement

Air transportation is a critical piece in the United States transportation system. A healthy competitive airline system, consisting of scheduled passenger, scheduled cargo, chartered passenger, and chartered cargo, is the backbone of this system. Within this complex system are rules, requirements, limitations, and authorizations placed upon the carriers that directly and indirectly impact the profitability of carriers in the air transportation industry.

Under the free market principles of the United States economic system, air carriers are allowed to boom and bust. Following the deregulation era in the late 1970s, previously existing limits placed upon the air carriers were removed, chiefly route and air fare restrictions. It was believed that competitive market forces would encourage efficient and well-mannered carriers to earn adequate profits and attract capital (Wensveen, 2007:58).

A critical relationship in the air transportation system is the relationship between commercial and military resources. This relationship is defined by the Civil Reserve Air Fleet, or CRAF. The CRAF is a voluntary, contractual agreement between civil air carriers and the Department of Defense (DOD) where, under the necessary auspices, the civil carriers provide a certain level of air transportation capability during varied levels of national emergency. In return, CRAF carriers are given privileged opportunities to fly DOD peacetime business, while saving the DOD the costs of procuring this capability in the organic fleet and manpower. It is estimated that the savings for DOD are \$1 to \$3B, annually, over the last 30 years due in large part to the CRAF program (Gebman, et al., 1994).

This relationship between a carrier flying DOD missions and other non-DOD missions is limited in scope by the “60/40 rule”. This rule states that a CRAF carrier can earn no more than 40% of its total revenue in the conduct of DOD business. One objective of this rule is to promote a healthy civilian air transportation industry whereby carriers are not overly reliant upon DOD business.

During the strong economy of the 1990s, the global aviation industry enjoyed profitability and growth through late 2001, when an economic slowing began. The terrorist events of September 11th, 2001 further amplified this downturn on a global scale, as shown in figure 1.

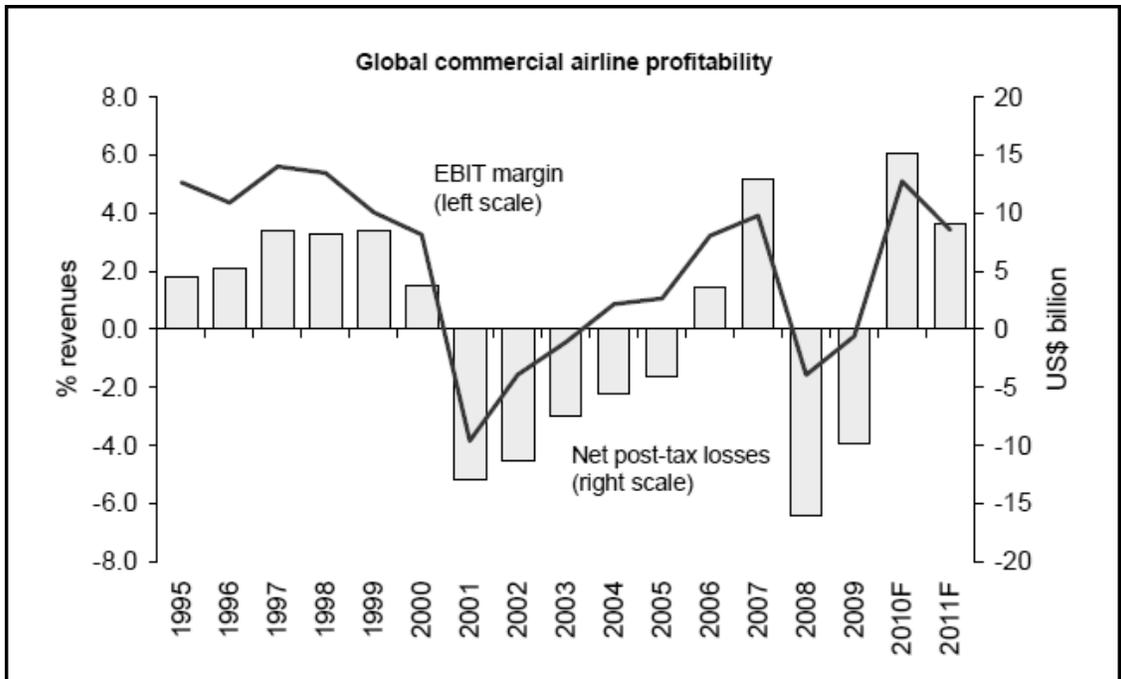


Figure 1. Global Commercial Airline Profitability (IATA, 2011)

Focusing solely on the United States air carrier market, as shown in figure 2, one sees a similar pattern of steady growth up to deregulation (1977-78), followed by a brief downturn tied with the economic slowdown in the early 1980s followed by a recovering economy and increased growth. This pattern repeated itself in the 1990s, during which time Operations Desert Shield and Storm also contributed to the losses during this time. The strong economic market of the mid-1990s is clearly shown, followed by a general slowing and the drastic impact of the terrorist events of September 11th, 2001.

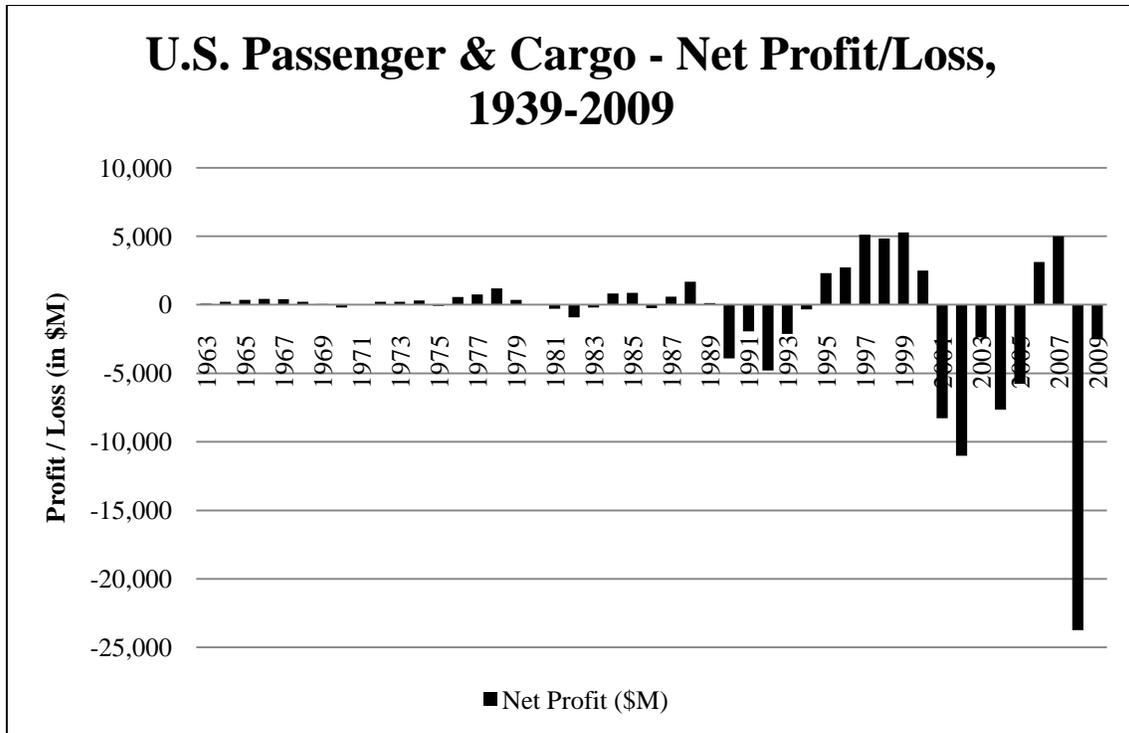


Figure 2. U.S. Air Carriers Profit/Loss, 1938-2009. (ATA, 2010)

However, post 9-11 DOD activities, notably the beginning of Operations Enduring Freedom in 2001 and Operation Iraqi Freedom in 2003, created an increased demand for military airlift capability, as shown in figure 3. This dramatic increase in DOD expenditures helped minimize some of the net loss experienced by the air carriers.

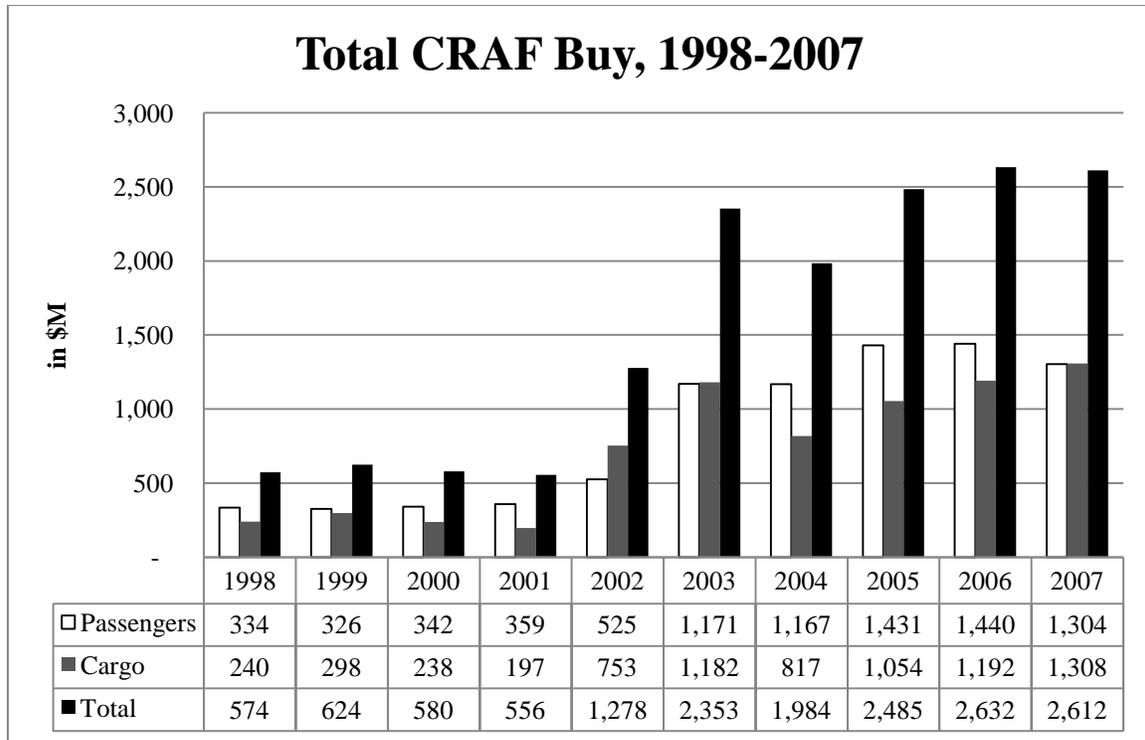


Figure 3. Total CRAF Buy (Graham et al, 2008)

This increase in airlift capability resulted in the temporary suspension of the 60/40 rule. The slowing of the commercial market (Figs 1 – 2) plus a surge in military demand (Fig 3) made this suspension necessary as well as common sense. This increase without a parallel suspension of the rule would be counterproductive for the DOD as they would simultaneously ask for increased support, while potentially issuing penalties for exceeding allowable levels of support.

In 2009, operations in Iraq reduced significantly leading President Obama to declare on 31 Aug 2010 that combat operations had ceased (Obama, 2010) and all troops would be out of Iraq by the end of 2011 (Obama, 2009). Afghanistan operations continue but the President has made it his stated goal of beginning troop removal in 2011 (Obama, 2009). Moreover, with the current economic slowdown, everyone is tightening their

purse strings, including the DOD. Secretary Gates has asked for each service branch to identify areas for savings with the goal of reducing the DOD budget by \$100B over the next five year (Miles, 2010). Reduced military airlift demands due to reduced requirements (Fig 4) added to a slow economy will affect airlift requirements and CRAF participants.

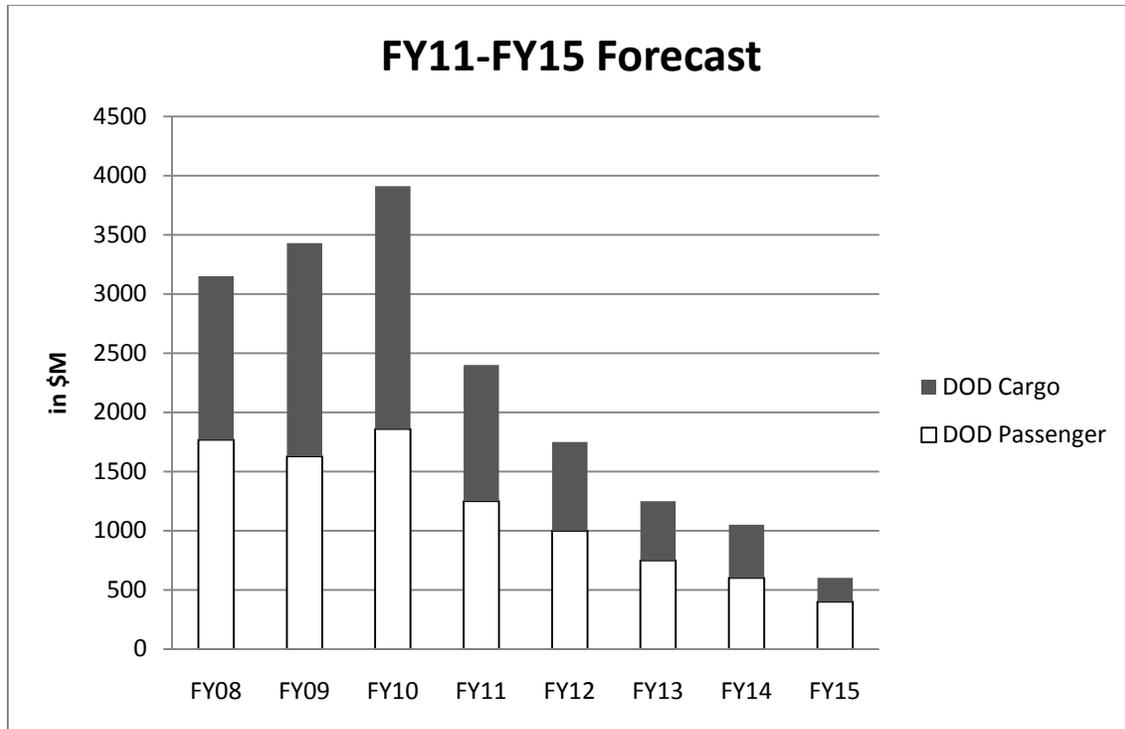


Figure 4. FY11 - FY15 Forecast of DOD Expenditures on Civil Air (AMC, 2011)

As military requirements ebb, there is still a need to maintain economically healthy air carriers for potential future CRAF operations. One method to promote the carrier's shift in focus from military to civil operations would be the reinstatement of the 60/40 rule. However the relevance of the 60/40 rule has been raised within government and air carrier channels (Costello, et al. 2009).

In light of the question of relevance of the 60/40 rule is an implied question of its measurement. The current 60/40 rule is based upon total revenue. However each air

carrier may calculate revenue in different ways, thus when comparing carriers who offend the Revenue 60/40 Rule, depending how the financials are kept may determine the offense and at what level. Therefore, the Revenue 60/40 Rule may be at worst a flawed measurement, or minimally biased against highly competitive air carriers in commercial markets. Therefore, to adequately compare like numbers, a common metric, with a common definition, needs to be identified and utilized for the 60/40 rule. A simple, easily calculated number for this potential new 60/40 rule is block hours. Block hours will be further discussed later in this paper.

This study examined the impact of reinstating the existing 60/40 rule, herein called the Revenue 60/40 Rule, which identified the Revenue Rule offenders if the 60/40 rule suspension is lifted. Second, it identified an alternate method for evaluating the 60/40 rule, herein referred to as the Block Hour 60/40 Rule. Finally, this study developed multiple scenarios using historical data, to evaluate the potential impact on the air carrier industry if no reinstatement of any 60/40 rule is achieved, highlighting potential problems and outcomes. It is projected that a lack of a 60/40 rule plus decreased DOD funding will result in at best reduced carrier capacity or at worst the complete loss of one or more carriers in their respective segments.

II. Literature Review

“In this part - ‘air carrier’ means a citizen of the United States undertaking by any means, directly or indirectly, to provide air transportation.” (DOT, n.d.)

CRAF Basics

The CRAF is a voluntary, contract based agreement between the DOD and each individual air carrier whenever additional military airlift, beyond what DOD assets can provide, is required (AMCI 10-402, 2004:16). There are multiple requirements an air carrier must maintain to participate in the CRAF. These requirements include, but are not limited to, approval by the Commercial Airlift Review Board (CARB), made up of numerous General and Flag officers, following a successful initial completion of an on-sight survey by DOD personnel who review the carrier’s safety, operations, maintenance, and financial capabilities and performance, a biannual review of their performance, a biennial follow-up on-sight survey, and agree to open information exchange between themselves and the DOD to include timely reporting of major safety mishaps and incidents (10 USC 2640). Additionally carriers must: contractually agree to provide at least 30% of their fleet for the CRAF for passenger carriers and 15% for cargo carriers; agree to provide U.S. citizen crew members at a 4:1 crew to aircraft ratio, excluding Air Guard and Air Force Reserve members and obtain Secret clearances for said members; agree to provide specific U. S. registered aircraft, including N-number (tail number) for

activation; and agree to report to the place of the DOD's choosing within 24 hours for Stage I and II or 48 hours for Stage III. (AMCI 10-402, 2004:18).

CRAF is divided into three progressive stages, which can be activated in part or in whole, by the US Transportation Command Commander (USTC/CC) with approval of the Secretary of Defense (SECDEF). Stage I is a committed expansion; Stage II is a Defense Airlift Emergency; Stage III is a National Emergency. (AMC Factsheet; AMCI 10-402, 2004:12-18). To date, CRAF activation has occurred twice: Stage I and part of Stage II were activated in support of Operations Desert Shield and Storm from 11 Aug 1990 to 24 May 1991 (Chenoweth, 1993: 10-15) and CRAF Stage I was activated in support of Operation Iraqi Freedom in from 8 Feb to 18 June 2003 (Bolkcom, 2006:3). Outside of these activations, civil air carriers regularly volunteer for missions in advance of or to prevent additional activations of CRAF to absorb the ebb and flow of increased or decreased DOD mission requirements, according to AMC/A3B, Commercial Airlift Division.

CRAF is additionally broken into multiple segments. A carrier's participation in a certain segment is based upon the air carriers desire to participate and FAA operations specifications approval to operate in that segment. The segments are the international long-range section, for those carriers with aircraft operating a minimum range of 3,500 nautical miles (nm); the international short-range section, for carriers operating a minimum range of 1,500 nm; the Aeromedical segment which is limited to Boeing 767 aircraft only; the domestic section for those with limited or no FAA international operating authority; and the Alaska section. (AMCI 10-402, 2004:15).

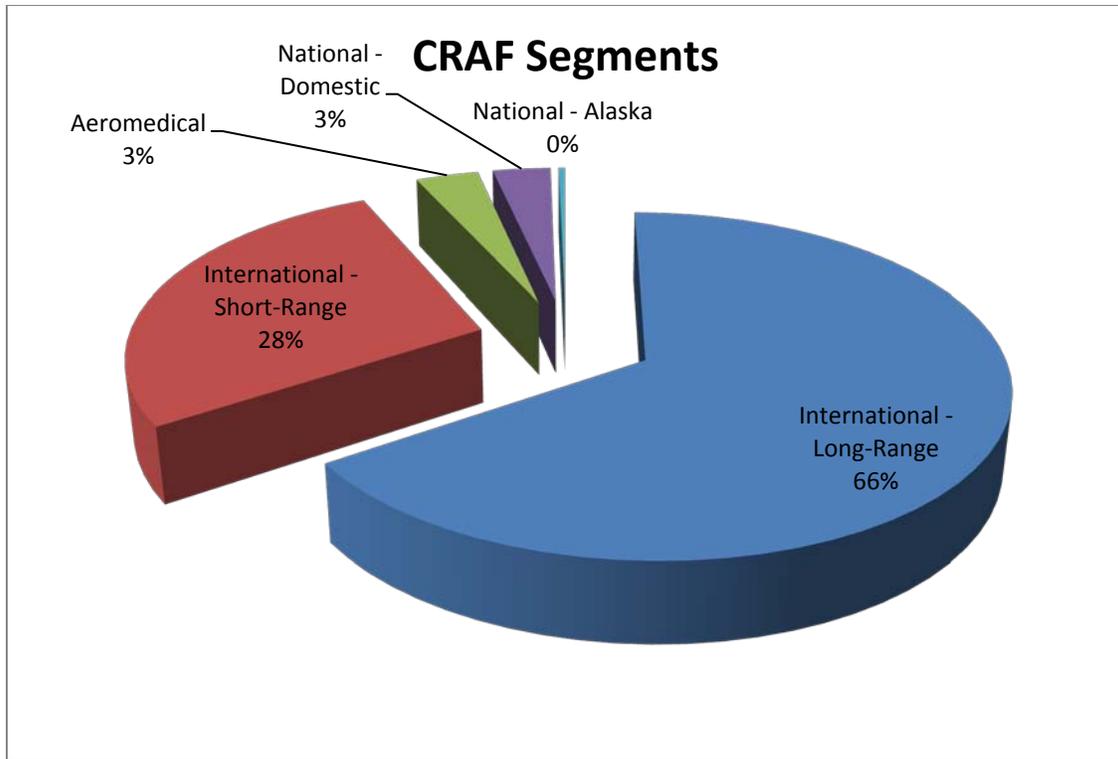


Figure 5. CRAF Segments. (AMC, 2010)

While the previous discussion focused on the DOD to carrier role, there is also a carrier to carrier role of interest which is referred to as teaming (Graham et al, 2008:ES-2, 2). CRAF carriers can choose, at their discretion, to participate, or not participate, in teams whereby they join with other CRAF carriers to pool their earned percentage of DOD business and disperse it amongst themselves (GAO, 2009:18). These teaming arrangements are worked out between the individual carriers and the one carrier who has assumed the role of team lead. Currently the three teams are identified as the Alliance, FedEx, and UPS teams (Donovan, 2011:11). This arrangement is beneficial to the carriers because the network passenger carriers and integrated carriers who bring the preponderance of potential aircraft opportunity to the CRAF can minimally participate in day to day DOD flight operations, but still earn financial and participatory benefits.

From the DOD's perspective, this keeps the larger network passenger carriers and integrated cargo carriers participating in CRAF without requiring them to fly day to day DOD missions. Additionally, if a team member carrier is unable to fulfill their DOD contracted mission, it typically falls on the other team members to cover that shortfall (Graham et al, 8).

Economics

During the 1990s, profitability of the air carriers consisted of roughly 0.95% of Gross Domestic Product (GDP) (Graham et al., 2003:C-6). In 1998, U.S. air carriers earned a net profit of \$4.9B, followed by 1999 net profit of \$5.3B, followed by a slowing in 2000 with net profits of \$2.6B (Fig 6). As shown, air carrier net profitability slowed entering 2001 and was further exacerbated with the terrorist events of September 11th, 2001. Immediately following, the air transportation industry suffered one of its largest periods of loss which partly contributed to a number of air carriers landing in Chapter 11, Reorganization under the Bankruptcy Code, or Chapter 7, Liquidation under the Bankruptcy Code, (Wensveen, 2007:66-67; U.S. Courts, n.d.) eventually reducing the air carrier industry to approximately 0.85% of GDP by 2004 (Graham et al., 2003:C-8). Through adjustments primarily in operations, increased fuel efficiency measures and retirement of older aircraft, in 2006, carriers posted profits after five years of losses (ATA, 2007:5). In 2007, of the \$14.1 trillion in economic activity, as measured by GDP, in the U.S. economy, air carriers accounted for \$68.7 billion, or 0.5% of GDP (FAA, 2009:12, 25) which resulted in net profits of \$7.7B (Fig 6). Unfortunately, rising fuel costs in 2008 and the economic recession in 2009 (ATA, 2010b:9-11) returned air carriers to their financial losing ways.

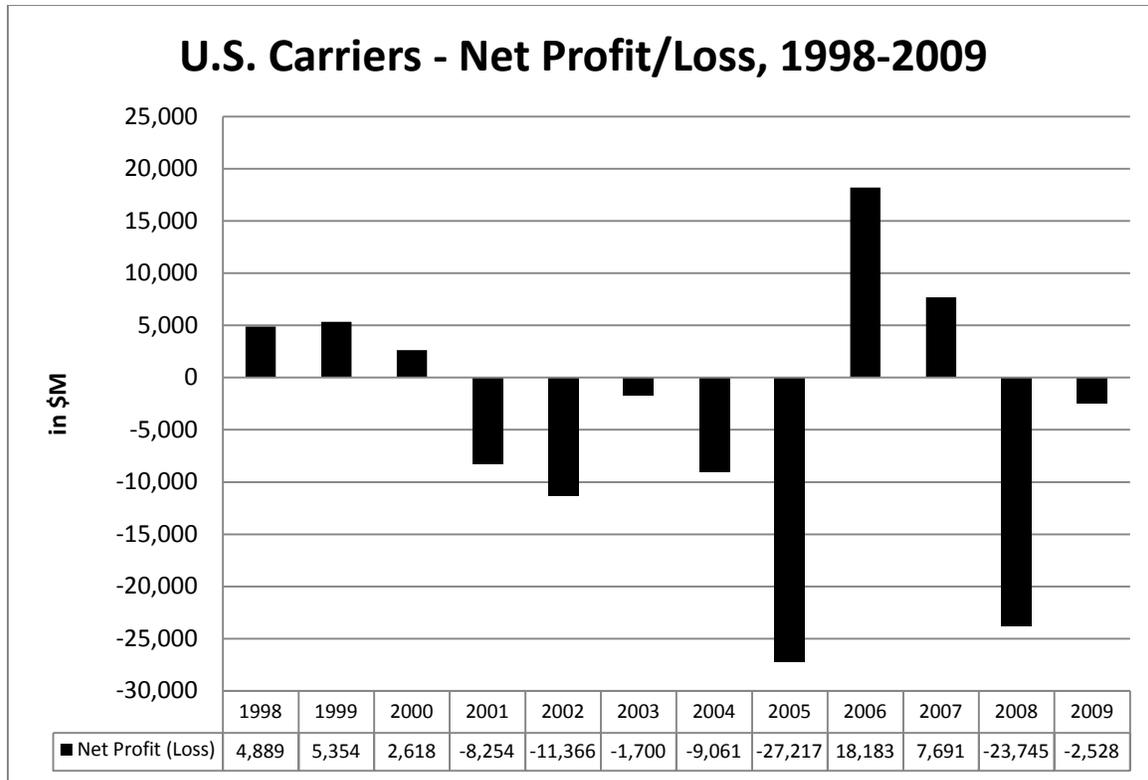


Figure 6. US Air Carrier Net Profit/Loss, 1998-2009 (DOT)

Due in part to these economic impacts, many carriers since the attacks of 2001 have entered Chapter 11 bankruptcy proceedings, to reorganize through a court approved process, or Chapter 7, where the company liquidates their assets and ceases operations (ATA, 2011). Notable to this study, 13 of the 22 studied CRAF carriers have spent time in bankruptcy proceedings since 2002 and three CRAF carriers have ceased operations (ATA, 2011).

Additionally, due to economic challenges, U.S. airlines have initiated significant changes. For example, scheduled passenger carriers have accelerated fleet restructuring and downsizing with expectations that this new business trend will continue (ATA, 2010b:4). Once these aircraft have been removed from service, carriers hesitate to add additional capacity (ATA, 2010a:9) because commercial carriers are focused on meeting

demands more efficiently. Therefore the network passenger carriers have little to no excess capability (GAO, 2009:12). Carrying this point to CRAF involvement displays why network passenger carriers are currently participating at lower levels than charter passenger carriers because shifting one aircraft off of their scheduled plan can cause major disruptions (GAO, 2009:12).

Charter passenger carriers, one of the primary capability providers for the DOD, have seen a substantial decline over the past five years. Due mainly to the decline in demand for charter passenger service, these carriers have seen a 60% decline in capability since 2003, (GAO, 2009:10), with a projection to remain flat into 2012 (Graham et al, 2008:ES-3). This decline included the bankruptcy and closure of ATA Airlines. ATA's sudden closure highlighted possible problems with DOD's dependence upon these charter carriers. When ATA ceased operations on April 3, 2008, responsibility for accomplishing those missions fell upon ATA's team lead, FedEx. Eventually resolved, the end results were service delays of 2-6 days (Doyle, 2009; Graham et al, 2008:8) including a week delay in the Maine National Guard's return home from Iraq (GAO, 2009:3). While this was a temporary service failure, the absence of adequate commercial revenue streams for ATA invigorated the debate on carrier health and the Revenue 60/40 Rule.

Cargo carriers tend to endure economic fluctuations better than passenger carriers. The economic downturn and terrorist attacks contributed to cargo carrier economic losses in 2001 (ATA, 2002:10-11) but rebound in 2002 (ATA, 2003:5) and continued to grow, resulting in \$30B in revenue in 2008 (ATA, 2009:10). Integrated cargo carriers, FedEx and UPS, dominated the cargo market to the point where they were one of the few air

carriers to maintain strong credit ratings, per Standard & Poor's ratings, in table 1 (Graham, 2008:12-13; ATA, 2010a:32-33).

Economic Regulation

The United States is “a government of laws, not of men” (Adams, n.d.). While the Kelly Act in 1925 created the first airmail contracts that eventually led to the creation of a private U.S. air carrier industry (Graham et al., 2003:A-6; Wensveen, 2007:48), eventually in 1978 with the Airline Deregulation Act, it was deemed that competition, not governmental control, should be the basis of air carrier operations (Wensveen, 2007:58). Since that time, any economic regulations should promote economic growth in the air transportation industry. As oversight for the air carrier industry, the Department of Transportation (DOT) has the statutory mission for:

“(6) placing maximum reliance on competitive market forces and on actual and potential competition – (A) to provide the needed air transportation system; and (B) to encourage efficient and well-managed air carriers to earn adequate profits and attract capital,... (14) promoting, encouraging, and developing civil aeronautics and a viable, privately-owned United States air transport industry. (15) strengthening the competitive position of air carriers to at least ensure equality with foreign air carriers,” (US Code, Title 49, Sec. 40101. Policy, Subsection A. ATA, 2010a:7)

In relationship to the air carriers, the DOD should not establish rules which may be perceived as violating DOT's statutory requirements, notably rule six. The DOT has stated, and the DOD should support, that air carriers should rely primarily on competitive market forces. Those carriers who rely heavily on any governmental source for a majority of their business may be alleged as essentially being subsidized by the government and consequently not actually relying upon competitive market forces.

Therefore, during peacetime operations, CRAF carriers with a preponderance of DOD business may be perceived as violating DOT’s statutory requirements.

Table 1. Standard & Poor's Corporate Ratings.

S&P Corporate Credit Ratings (July 12, 2010) for North American Transportation Companies, “Strongest to Weakest”			
AA- to A-	BBB+ to BBB-	BB to B	B- to CCC-
2. UPS	14. FedEx	34. Alaska Air Group	45. UAL Corp.
	17. Aviation Capital Group ¹	35. Global Aviation Holdings ²	47. JetBlue Airways
	19. Southwest Airlines	38. Delta Air Lines	48. AirTran Holdings
		43. Continental Airlines	53. AMR Corp. ³
			54. US Airways Group
			55. Air Canada

¹ Commercial aircraft leasing and asset management company.

² World Airways, North American Airlines.

³ American Airlines, American Eagle.

(ATA, 2010a:33; S&P, 2011)

Economic Ratings

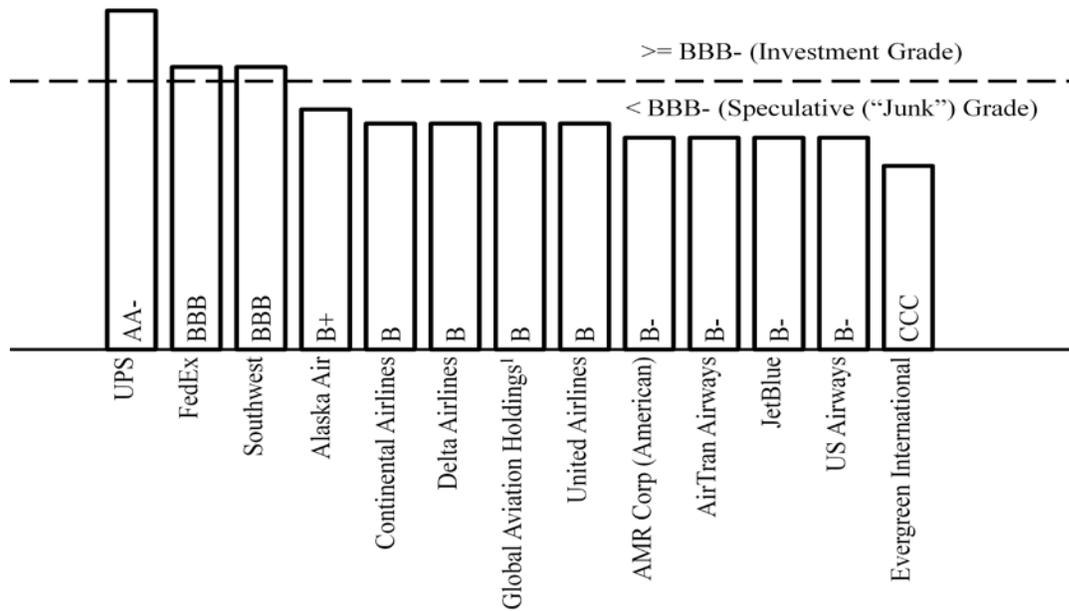
Standard and Poor (S&P) trace their ratings service back to 1860 when Henry Poor first published the *History of Railroads and Canals of the United States* because he was concerned about the lack of quality information available for potential investors. Since 1916, S&P have provided investors with published credit ratings and typically express their ratings as letter grades ranging from ‘AAA’ to ‘D’ (S&P, 2010b). The rating is intended to help identify the creditworthiness of a company, encompassing the likelihood of default plus secondary credit factors such as payment priority, projected recovery and their credit stability (S&P, 2009:5). Those who receive any ‘A’ rating are

said to have strong capacity to meet their financial commitments. Those with a 'BBB' rating have adequate capacity, but adverse economic conditions may likely lead to a weakened capacity. From 'BB' down to 'CC', those are regarded as having significant speculative characteristics and a 'D' rating is assigned when S&P believes the organization will have a general default and will fail to pay most, if not all, of their obligations (S&P, 2010b:11, 13). In general, those organizations that receive an S&P grade of 'BBB' or better are considered investment grade while those 'BB' and lower are considered speculative grade (S&P, 2010a:10) or junk bonds (Investopedia, n.d.).

These credit ratings are important because they influence corporations, in this instance, air carriers, ability to procure credit and investment. Higher credit ratings allow an air carrier to receive more favorable terms on capital for new aircraft purchases and other necessary items. Additionally, as stated above, these ratings may identify those air carriers who may be more likely to default.

From the CRAF perspective, the economic rating of all carriers should be noteworthy because of the unique requirements of these participants. Due to their ability to provide additional airlift, DOD should be able to assume CRAF participants can execute needed missions but if carriers find themselves in economic hardship, which may be partly identified by their S&P rating, this may raise concerns within DOD of the specific carrier's ability to meet requirements. DOD should not actively attempt to change or influence a CRAF carrier's S&P rating however any rules and regulations laid upon the CRAF carriers must be done to ensure adverse impacts upon a carrier's profitability and competitiveness.

S&P Ratings of U.S. Air Carriers



¹ North American & World Airways

Figure 7. S&P Credit Ratings (S&P, Apr 2010)

Economic Forecast

In a dynamically challenging environment, forecasting is challenging, yet the overall economic outlook is positive with the recession's end in 2009 and real GDP growth positive since the 3rd quarter of 2009 (Federal Reserve Bank, 2011:3). Air carriers are expected to gradually see improvements as well, noting that in 2010 carriers fared better than 2008-09 (ATA, 2010b:4) with some forecasting air carrier profits upwards of \$8.6B (IATA, 2011:1). Looking farther out, the FAA estimates that sustained economic growth will average 3% from 2011-2015 (FAA, 2010c:30). With expectations of a growing U.S. economy, expectations are that network passenger carriers will increase capacity on average of 2.5% per year with an expectation of increased passenger loads of 2.6% through 2030 (FAA, 2010c:33).

Cargo carrier activity historically tracks with GDP, therefore forecasts are based upon models that link cargo and GDP. Therefore expected growth in 2010 was 3.4%, followed by 4.9% in 2011, then averaging 5.0% growth through 2030. Additionally, the all-cargo carriers are projected to increase their share, notably in the U.S. domestic markets, as the integrated carriers have shifted to a focus on express services (FAA, 2010c:40-41).

Future economic growth is not guaranteed but forecast measures indicate an upward trend. This is a positive sign for air carriers, especially those who expect to see their DOD support dwindling. CRAF carriers will need to continue with smart business maneuvers, but heavy dependence upon the DOD for a majority of their revenue should not be necessary during the upcoming years.

60/40 Rule

Proper incentives to promote CRAF participation are an ever present challenge and balancing act. When called upon to support CRAF activation, the civil air carriers move nearly 90% of DOD personnel and 40% of DOD cargo (GAO, 2009:1). Currently the primary incentive for participation is the contractual agreement whereby the carriers that participate in CRAF are given opportunity to compete for peacetime government business (Graham et al., 2008:1; GAO, 1992:6). Per figure 4 above, one can see that pre-9-11, this revenue potential was roughly \$550M then soared to over \$2.5B and remained there. While providing access to this vast sum of potential earnings, DOD limits the portion an individual carrier can earn from DOD revenue, more commonly called the 60/40 rule.

Following the tragic crash of Arrow Air flight 1285 on 12 December 1985, which killed 248 U.S. Army personnel, primarily from the 101st Airborne Division, and eight crew members (Gough, 1986), as a part of the National Defense Authorization Act of FY1987, (U.S. Congress, 1987), 10 USC 2640 mandated DOD oversight of CRAF carriers. Part of this oversight included the 60/40 rule. The 60/40 rule was implemented in a letter from then Assistant SECDEF James P Wade, Jr. on 9 June 1986 which identified that Military Traffic Management Command (MTMC, now Surface Distribution and Deployment Command, or SDDC) and Military Airlift Command (MAC, now Air Mobility Command, or AMC) would “Develop guidelines and an implementation schedule to require all U.S. air carriers serving the DOD... to derive no more than 40% of annual gross revenue from the DOD.” While the original intent of the 60/40 rule was to add an additional level of safety upon carriers flying for the DOD (Costello et al, 2009; Konicki, 1996), it also encouraged air carriers to compete commercially (Costello et al, 2009) and not depend upon the ever changing DOD requirement to “ensure that CRAF carriers maintained a strong business base, efficient operations, and modern fleets, all of which would prevent carriers from going out of business when DOD demands were low” (GAO, 2009:16).

Block Hours

Block hours are the industry standard measurement of aircraft utilization. This is the “time from the moment the aircraft door closes at departure of a revenue flight until the moment the aircraft door opens at the arrival gate following its landing” (MIT, n.d.). As the standard measure, it would seem logical to utilize it from a CRAF standpoint as well.

As previously mentioned, a variety of numbers can make up one's financial revenue sheet. Therefore trying to compare DOD to non-DOD revenue likely depends upon a carrier's accounting methods and commercial contract terms. Block hours are the same across the air carrier spectrum, regardless of which air carrier one is talking about. Therefore it is easily traceable and comparable.

Block hours are also an acceptable measurement tool because a carrier must fly 100% of their block hours during the year. Therefore, if a DOD measurement of air carrier health can be summarized as the amount of work a carrier is doing, if a reasonable percentage of their block hours are non-DOD, then it is reasonable to assume these non-DOD block hours are being flown for another commercial enterprise and therefore maintaining relative healthy levels of overall operational activity.

III. Methodology

Data

To examine the magnitude and scope of reinstating the 60/40 rule and develop scenarios on the likely impact on the carriers and CRAF, financial and block hour data was collated from the Bureau of Transportation Statistics (BTS) website from DOT, AMC, and the Global Decision Support System 2 (GDSS2) computer system. The financial data set contains information for the years 2007-2010 and block hour data was scoped to 2007-2010.

There are multiple contracts an air carrier can pursue for peacetime DOD business. From the CRAF perspective, the primary contracts for which the 60/40 rule applies includes the Annual International Airlift Services Contract, commonly referred to as the “fixed buy” and the “expansion buy”. The “fixed buy are the known requirements that are issued with the solicitation and make up the minimum guarantee of the contract” (Carlson, 2011). The expansion buy is considered as “requirements that are unknown/not firm at the time the solicitation is issued and are awarded as needing during the contract period” (Carlson, 2011). Additional DOD contracts, such as Government Service Agency (GSA) city pairs program or World-Wide Express (WWX) numbers are included in the overall 60/40 computation. The computation for the financial 60/40 rule is a simply the proportion of a carrier’s DOD earned revenue to the carrier’s total revenue.

These percentages were calculated for all CRAF carriers that participate in the International Segment, Long-Range section, as shown in Table 2, from FY2007-FY2010.

Table 2. CRAF: International, Long-Range Segment

Carrier's primary operation	Identification	# of carrier's in this study.
Network (Passenger) carriers	NC#	6 ¹
Charter passenger	CP#	4
Integrated Cargo carriers	IC#	2
Charter cargo	CC#	8 ²

¹Delta and Northwest Airlines merger completed in FY10; their numbers were combined.

²There were 11 CCs from FY08-FY10. Two are excluded due to lack of peacetime missions and <.01% CRAF participation; one was excluded because they also flew CP and data separation was not possible.

(AMC Form 312, 2010)

To examine an alternative measurement, block hour data was collected from GDSS2 and BTS. GDSS2 is the command and control system for all AMC operational missions, including those commercially flown. This system is utilized and operated by AMC's command and control center, the 618th Air Operations Center (AOC). Commercial missions flown for the DOD are typically built by the individual air carrier's dispatch team using their own FAA approved software. Once complete, this information is forwarded to AMC and input into GDSS2. Operational control of these missions is tracked and data based through GDSS2. The raw data included a myriad of information such as mission number, beginning and ending location, and departure time and arrival time. The key piece from this data is the block-to-block time column. This data was then filtered to solely analyze CRAF participants, as shown in Table 2. Once the data was pared down, and additional conversion column was added to convert the block time format (H+MM) into standard military time format (H.M), per Table 3.

Table 3. DOD Minute Conversion

CONVERSION				
Minutes		Duration		
1	~	2	=	.0
3	~	8	=	.1
9	~	14	=	.2
15	~	20	=	.3
21	~	26	=	.4
27	~	33	=	.5
34	~	39	=	.6
40	~	45	=	.7
46	~	51	=	.8
52	~	57	=	.9
58	~	60	=	Next

(AFTO 781)

This was completed through MSExcel’s “lookup” function using a stand-alone table. All times were converted to military times, based upon AFTO 781 for standardization and ease of use. By limiting the acceptable range of values in the lookup table, this provided an additional quality check for the GDSS2 data. For example, the lookup table was initially limited to 15+30 hours. (United Airlines operates a Boeing 747-400 from Chicago-O’Hare to Hong Kong with a listed travel time of 15+20.) This was gradually expanded to 16+24 (16.4) as the maximum time. This additional hour was deemed acceptable by the researcher because it could be explained by excessive winds crossing the ocean, additional hold time at an arrival airport, or more likely extended taxi time on either the front or back portion of the mission. It has been this researcher’s experience that it is not uncommon, especially within the CENTCOM Area of Responsibility, to land and then have an excessive taxi time while waiting for other aircraft to move or vacate your scheduled parking location. All block hour values in excess of 15.0 are in Appendix 2. These 24 missions were accepted because their overall affect on the 110,000+ lines of

mission data analyzed were deemed minimal and reasonable explanation for the length of mission could likely be attributed to mission type (i.e. into/out of Afghanistan; into/out of high-use U.S. field (KJFK, KORD)) or seasonal weather (note many of the long times have a like high-time date). Additionally, all of the aircraft types are capable of achieving the stated block time. Those times outside of this range are discussed in the below Limitations/Assumptions section. These DOD block hours were measured in proportion to the carrier's total block hours to create a Block Hour 60/40 percentage.

Data Utilization

The data allowed for easy projections to be made. The researcher developed three scenarios (S1, S2, and S3) and assessed the impact on passenger carriers and cargo carriers separately. Scenario 1 (S1) assumed that the passenger or cargo carrier earning the largest percentage of revenue from the DOD was removed due to a simulated business shutdown or some other event that prevented them from DOD participation. S1 was selected based on an assumption that a carrier who heavily relies on a high percentage of DOD business to remain solvent is less financially stable, and therefore more apt to go out of business. Scenario 2 (S2) assumed that the passenger or cargo carrier earning the highest amount of DOD business (in dollars) was removed due to a simulated business shutdown or other event. S2 was selected to see the impact of the largest amount of DOD dollars being redistributed. Scenario 3 (S3) assumed a worst-case scenario whereby both carriers previously assessed in S1 and S2, simultaneously experiencing a business shutdown. This was accomplished to identify potential impact severity on the remaining CRAF carriers.

The effect (a, b, or c) of the aforementioned scenarios was then applied to the remaining carriers in three different manners. The first effect (a) is a simple equal distribution of the scenario's revenue and block hours among the remaining carriers. This effect was selected to see a generalized impact. The second effect (b) distributed the scenario's revenue among the remaining carriers based upon the CRAF carriers' percentage of contribution to CRAF Stage III which was selected simply to match contributions with capability. The final effect (c) is a spread of the scenario's revenue and block hours divided 70% amongst the remaining charter carriers and 30% for the network passenger or integrated cargo carriers, which was selected because charter carriers provide more rapid flexibility than network carriers or integrated cargo carriers. A 70/30 split was chosen because traditionally charter carriers average 90% of the peacetime long-range international business, per table 4. This researcher assumed this 90/10 split would be unsustainable and network carriers and integrated carriers would have to cover a larger percentage of the peacetime business, short of an actual CRAF activation. This should become more evident during the upcoming discussion of the results of the various scenarios and their effects. By using this historical review, one can forecast potential impact.

Table 4. Percentage of Block Hours Flown

	FY10	FY09	FY08	FY07
PASSENGER				
Passenger Total Block Hours	92,201.1	87,600.3	71,266.8	102,079.0
NC Total	4,653.0	8,330.3	4,604.3	13,963.4
% of NC Hrs	5.05%	9.51%	6.46%	13.68%
CP Total	87,548.1	79,270.0	66,662.5	88,115.6
% of CP Hrs	94.95%	90.49%	93.54%	86.32%
CARGO				
Cargo Total Block Hours	48,587.4	45,439.3	44,753.6	37,696.5
IC Total	3,632.0	3,275.3	2,289.1	625.1
% of IC Hrs	7.48%	7.21%	5.11%	1.66%
CC Total	44,955.4	42,164.0	42,464.5	37,071.4
% of CC Hrs.	92.52%	92.79%	94.89%	98.34%

Based on GDSS2 Data

This data utilization was established with the expectation that without some incentive on the part of DOD to encourage the carriers to balance their business models by preparing to reduce their DOD business and trade it for more non-DOD business, those carriers that continue to rely upon DOD revenue will find themselves caught in the downward spiral of reduced DOD budgets. The intent of this data utilization is to demonstrate what may happen to the remaining carriers and DOD if these carriers cannot find business elsewhere. Under the status quo, it is expected reduced DOD revenue will result in the loss of at least one air carrier, dramatically impacting the remaining carriers.

Limitations / Assumptions

GDSS2 is a manually updated system. During the execution phase of a commercially operated DOD mission, the air carrier crew relays their times to their home dispatch team who relays that information to the 618th AOC for input to GDSS2. For

those missions departing or arriving from a military location, the local command post will input the times into GDSS2. In this instance, the 618th AOC is able to relay commercially operated mission information to the individual air carrier's dispatch, if needed. Due to the continuous requirement for up to the minute tracking of DOD missions, it is assumed that GDSS2 data is accurate. Likewise, as block hours are a required report from the air carriers to DOT, it is assumed that BTS data is also accurate.

GDSS2 block hour values beyond the accepted range (0.0 – 16.4), or incomplete data, were flagged during the lookup process and manually adjusted for based upon either average time of like flights during the similar time frame or common sense. For example, if a flight took on average 10+00 hours but was listed as 34+00 hours, the researcher assumed there was a 24+00 data entry error, likely caused by an incorrect date entry into GDSS2. These corrections are highlighted within the database. On other rare occasions, a block hour time beyond 16.4 was changed based upon the average flight time of other flights between the same locations, by the same carrier, during the same evaluation time frame, utilizing the same airframe. Additionally, GDSS2 data would have a land time, but no final block time. In these instances to keep the data as part of the block hour total time, the land time was utilized for the block time.

Once the data for said carrier was calculated, it was then tabulated into a fiscal year calculation. This fiscal year data was again divided by the carrier's total block hours to learn the carrier's Block Hour 60/40 comparison. A comparison of the Revenue 60/40 Rule to the Block Hour 60/40 Rule shows a correlation of .87.

A final limitation is the lack of ability to truly forecast demand, especially in the conflict environment. The projections and simulated forecasts and their impact utilized

in this study are based upon historically high usage from 2007-2010. Therefore implications made by the researcher are based upon these high utilization numbers.

Hypothesis / Expectations

One, there will be a number of air carriers, likely more passenger than cargo, who have exceeded the Revenue 60/40 Rule. These carriers will likely be charter carriers, not network passenger or integrated cargo, as these types of carriers participate more heavily in day-to-day DOD operations.

Two, a shift from the Revenue 60/40 Rule to a Block Hour 60/40 Rule will be beneficial. First, a block hour comparison is more equitable across the air carrier spectrum. Second, it will show more balance of an air carrier's overall usage for DOD versus other flight opportunities.

IV. Results and Analysis

The purpose of this study was to identify those CRAF-participating air carriers whose amount of revenue from the DOD exceeds 40% of their total revenue and identify potential issues with enforcement of the Revenue 60/40 Rule. Secondly, this study sought a different method of measuring an air carrier's dependence upon the DOD for business, such as a Block Hour 60/40 Rule. Finally, this study, using historical information, projected the potential impact of the loss of a CRAF carrier and that potential impact upon the remaining CRAF carriers.

Revenue 60/40 vs. Block Hour 60/40

First, the data, in tables 5 and 6, confirms that there are a number of carriers that exceed the currently suspended Revenue 60/40 Rule. Second, a majority of these carriers are charter carriers. Of note, all four passenger charter air carriers exceeded the Revenue 60/40 Rule for FY08-FY10 and three of the four in FY07. The violations are less dramatic for the charter cargo carriers with only four of the eight in exceeding in FY10 and two for FY07-09.

Table 5. Comparison of Revenue 60/40 Rule to Block Hour 60/40 Rule - Charter Passenger

ID	FY2010		FY2009		FY2008		FY2007	
	Revenue	Block Hr	Revenue	Block Hr	Revenue	Block Hr	Revenue	Block Hr
CP1	95.28%	76.30%	97.62%	80.41%	80.08%	61.79%	68.81%	39.73%
CP2	91.75%	73.53%	89.32%	70.49%	73.60%	51.71%	78.80%	45.53%
CP3	88.01%	108.56% ¹	82.82%	85.77%	44.93%	30.33%	34.71%	6.47%
CP4	81.36%	58.22%	78.12%	41.76%	71.44%	41.90%	72.49%	29.38%

¹ Data error. A readily identifiable error in BTS or GDSS2 was not available. Further research to both the carrier and DOT are pending.

Table 6. Comparison of Revenue 60/40 Rule to Block 60/40 Rule - Charter Cargo

ID	FY2010		FY2009		FY2008		FY2007	
	Revenue	Block Hr	Revenue	Block Hr	Revenue	Block Hr	Revenue	Block Hr
CC1	0.36%	0.21%	0.12%	0.15%	0.00%	0.00%	0.05%	0.06%
CC2	55.66%	29.26%	39.11%	33.99%	29.47%	30.82%	31.82%	22.17%
CC3	80.41%	4.60%	19.56%	2.09%	13.62%	0.94%	4.78%	1.48%
CC4	60.14%	16.57%	80.13%	18.85%	79.72%	16.54%	56.29%	12.89%
CC5	95.98%	57.05%	84.13%	72.49%	66.38%	63.74%	73.56%	49.64%
CC6	11.96%	14.28%	9.67%	7.74%	6.67%	6.64%	8.08%	4.14%
CC7¹	--	--	--	--	--	--	--	--
CC8	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	N/D ²	0.10%
CC9¹	--	--	--	--	--	--	--	--
CC10	29.27%	7.59%	24.73%	L/D ³	20.78%	L/D ³	3.03%	L/D ³

¹ Excluded due to lack of peacetime missions and <.01% CRAF participation.

² No reported revenue data available.

³ Lack of Block Hour data in BTS for this carrier.

Some interesting observations can be made regarding these charter cargo carriers. One, of the two new FY10 offenders, one displayed a rapid change in DOD revenue when compared to prior years. This could be due to an intentional change in their corporate business plan, an interest in participating more in DOD operations, or a loss of

non-DOD business. The other new FY10 offender historically had remained a few percentage points below the Revenue 60/40 Rule, indicating they understood the rule and intentionally build their business plan to maximize their DOD business within the structure of the Revenue 60/40 Rule. The reason for the spike would need the passing of time to see if they return to pre-FY10 levels or further, company specific research.

Of the two consistent cargo offenders, both have dramatically exceeded the Revenue 60/40 Rule every year. This would indicate an internal company decision to focus heavily on DOD peacetime missions as a key component of their business plan.

Third, the data show that many of those in violation of the Revenue 60/40 Rule are likely in violation of a Block Hour 60/40 Rule as well, but to a less severe degree. On average, this revenue to block hour difference is roughly a 10-20% difference. Therefore, using the Table 5 numbers, carrier CP1 earned 95.28% of their revenue from DOD in FY10 but flew only 76.3% of their block hours for DOD. Assuming DOD decided to enforce the Revenue 60/40 Rule for FY11, CP1 suddenly needs to replace 55% of their DOD revenue with 55% from other commercial sources. Should DOD change the rule to a Block Hour 60/40 Rule, then CP1 would need to replace 36% of their DOD block hours with like non-DOD block hours. Utilizing this simple comparison, it is evident that a requirement move by DOD away from the Revenue 60/40 Rule to the Block Hour 60/40 Rule will likely result in a less dramatic impact upon carrier CP1. Similar impact statements can be made regarding the charter cargo carriers (see Table 6) as well.

There is an advantage of a Block Hour 60/40 Rule. In FY10, CC2 violated the Revenue 60/40 Rule by 15%, but remained well under a Block Hour 60/40 Rule. Likewise in FY09 and 08, CP4 broke the Revenue 60/40 Rule at 78% and 71%

respectively, but only exceeded a Block Hour 60/40 Rule by 1-2%. This difference highlights a few items of interest to the DOD. One, each carrier calculates their revenue somewhat different thereby affecting their revenue 60/40 in various ways. Conversely, block hours are simple to measure, easy to obtain, and easy to compare against carrier reported data. Secondly, a transition to a Block Hour 60/40 Rule should benefit the air carriers, especially during this time of transition off of a heavy DOD-influenced budget, while still addressing the intent of the Rule. With only minor exceptions, all carriers operate a smaller percentage of block hours on behalf of DOD than they earn in revenue. Therefore, a transition to a block hour 60/40 rule would immediately allow the carriers more flexibility to create additional demand without penalty and an immediate dramatic effect of severely reducing their revenue stream. This also benefits the DOD by making a less dramatic change to air carrier requirements, which likely will increase an air carrier's ability to replace the lost DOD revenue more gradually.

No 60/40 means No Surge Capability

A key component of the CRAF is its ability to provide a flexible, surge capability above and beyond what the DOD is able to accomplish internally. DOD demand ebbs and flows and a benefit of CRAF, especially charters, is their ability to provide surge capability during high movement times that stave off, or at least delay, possible CRAF activation. One focus of this study was to examine the impact of complete removal of the 60/40 rule with respect to surge capability in the CRAF. Figure 8 shows the carrier's FY2010 block hours with respect to their CRAF commitment by stage (AMC Form 312, 2010). These charter carriers have limited assets, with CP1, CP3, and CP4 owning nine aircraft each and CP2 owning 14 (respective carrier websites; airlinepilotcentral.com).

Based upon these small numerical fleet sizes, these carriers currently have minimal expansion capability leading to a virtual inability to fly any additional missions. Figure 8 below is a simple visual representation comparing what the charter passenger air carrier is currently performing for DOD (% of Block Hours block) compared to the percentage of their respective Stage commitment. The areas where the percentage of Block Hours exceeds any percentage of CRAF Stage commitment (identified by the hatched section) are areas of lost surge capability.

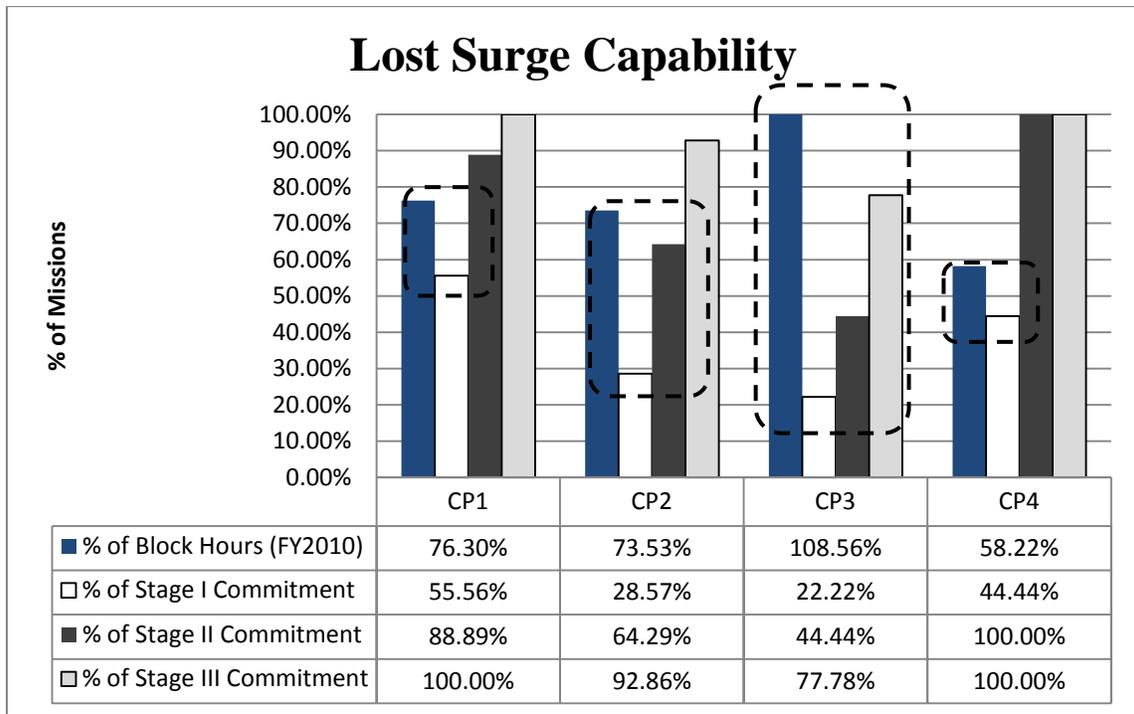


Figure 8. Lost Surge Capability

Through the use of this block hour percentage measurement, easy assessments of overall carrier utilization can be made. If a carrier is flying X% of their total block hours for DOD, it is reasonable that X% closely correlates to their usage of aircraft as well. Therefore, it is reasonable to assume that CP1’s current block hour rate of 76.3% means CP1 is operating roughly 76.3% of their fleet on behalf of DOD. However, CP1 has

contractually agreed to provide 55.56% of their fleet to the DOD for a Stage I activation. It is clear, that CP1 is effectively operating above their current Stage I commitment. Charter passenger carriers, CP2, CP3, and CP4 are similarly flying more block hours (as a percent of total block hours) for the DOD than their CRAF Stage I commitments. Therefore, if the DOD activated Stage I, the charter passenger segment would most likely not have sufficient capacity to support DOD airlift requirements.

There is the possibility that some may argue based on the above premise, that even if a Block Hour 60/40 Rule were enacted this may still be the case. However, when viewing the above, if a Block Hour 60/40 Rule was enforced, theoretically, CP1, the carrier with the largest percentage of Stage I commitment, could honor their Stage I commitment (55.5%) and continue flying their sub-40% other DOD Block Hour commitments, utilizing 95% of their fleet.

While this example is simplistic and hypothetical, it, along with the data, should give DOD leadership pause when considering the effects of eliminating the 60/40 rule completely. In this isolated incident, DOD has lost a reasonable percentage of the airlift passenger movement capability. DOD leadership would now be faced with a significant decision in this example. One, they could continue Stage I activation, which would work, however begin placing a larger strain on the already stressed network carriers, who as previously mentioned are maximizing their schedule utilizing every available aircraft for scheduled revenue flights, or two, pursue activation of Stage II. However a revisit to Figure 8 shows that CP2 and CP3 already exceed their Stage II commitment as well. Based upon this data, without a 60/40 rule of some type in place, DOD will lose their pre-

CRAF activation surge capability, likely drastically increasing the potential for more frequent or higher levels of stage activations.

Simulated Carrier Loss and its Impact

DOD expenditures on commercial airlift have reached unprecedented levels through most of the past decade. With the drawdown in Iraq and Afghanistan, this rate of expenditure is forecasted to significantly reduce by 2015. One can easily see in figure 4 above, that it is estimated in the next five year, expenditures will return to their pre-9-11 numbers. This should also cause DOD leaders to evaluate how to prepare air carriers for this upcoming change and encourage a change in behavior now to minimize the future impact upon the air carriers.

As previously discussed, the data allowed for the removal of one (or more) carrier(s) and then take the “lost” block hours from that/those carrier(s) and add that time onto the remaining carriers. The point of this scenario was solely to show the potential impact upon the other carriers using FY10 block hour numbers. The scenario removal process (S1, S2, S3) and its potential effect (a, b, c) are demonstrated in table 7 below. In each scenario, it is not surprising that the loss of a carrier impacts the remaining carriers. The challenge is to attempt to demonstrate how the remaining carriers would respond to such an event. As a baseline, the effect upon the remaining carriers will be looked at through the lens of one mission equal to 8+00 block hour. This is based upon an East Coast CONUS departure to a Germany arrival (or vice versa) averaging 8+00, per the GDSS2 data. History has shown the carriers can adjust to dramatic changes, such as the loss of an air carrier (reference the previous discussion when ATA ceased operations) but not without challenges.

Table 7. Scenario Matrix

Effect upon other carriers:	(a) Equal Allocation (“Peanut Butter Spread”)	(b) CRAF (Stage III) Participation-based Allocation	(c) 70/30 Allocation (70% distributed to CP or CC; 30% distributed by NC or IC.)
Scenario 1 (S1): Assume CP (or CC) with highest 60/40 offense gone.	S1a	S1b	S1c
Scenario 2 (S2): Assume CP (or CC) with highest DOD usage, in pure \$\$, gone.	S2a	S2b	S2c
Scenario 3 (S3): Assume Scenario 1 & 2 CPs (or CCs) are gone.	S3a	S3b	S3c

Scenario 1 (S1):

As discussed previously and shown in Table 6 in S1, CP1 was identified as earning the highest percentage of their revenue from the DOD. Thus, S1 assumed that CP1 did not fly their missions.

Scenario 1a (S1a) - Passenger:

Thus, for effect (a), CP1’s block hours from FY07, FY08, FY09, and FY10 was evenly divided by the remaining nine carriers and added to that respective carrier’s DOD and total block hours. Effect (a) was chosen to evaluate the overall impact of the loss of one carrier upon the remaining carriers. This new block hour commitment, using FY10 numbers, is demonstrated in figure 9.

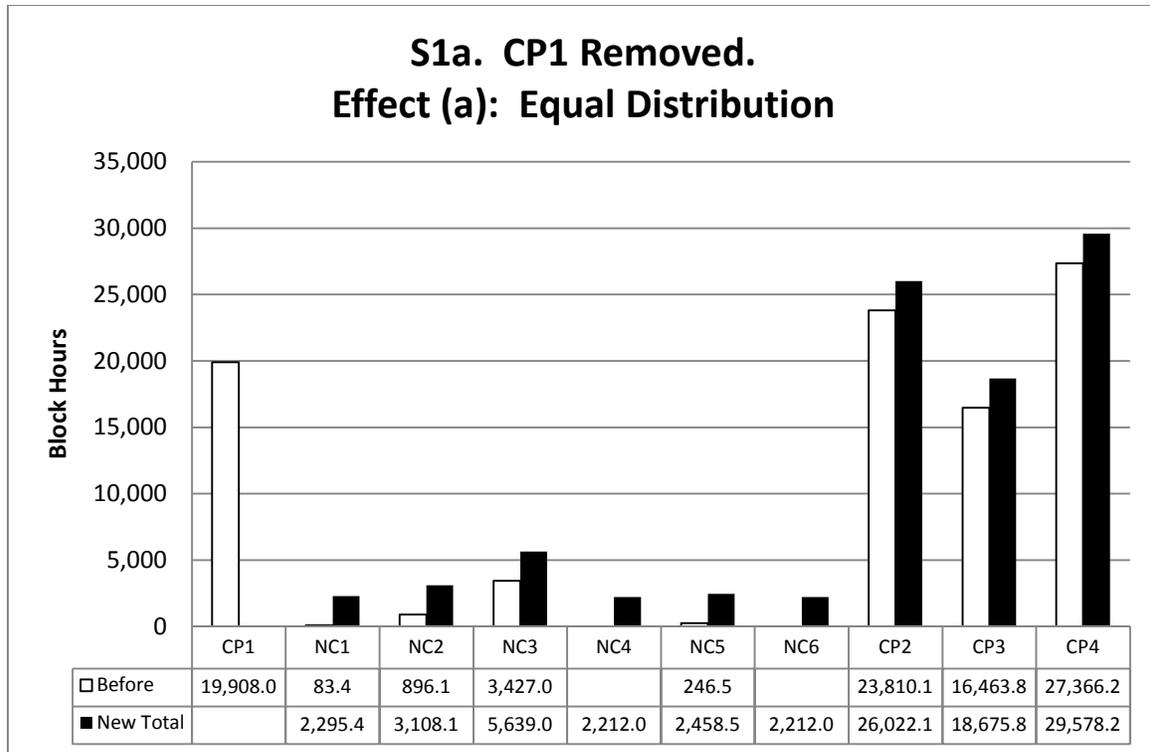


Figure 9. S1a. CP1 Removed. Effect (a): Equal Distribution

A simple analysis shows that each carrier would need to absorb an additional 2,212.0 block hours should CP1 cease operations. Using the above discussed 8+00 block hour equals one mission, on average this additional 2,212.0 block hours would require each remaining carrier to generate an additional 277 missions (2,212 hours divided by 8 hour mission equals 276.5 missions). For the network carriers with their limited additional resources, the likely result is a reduction in their scheduled service of 277 missions to accomplish these DOD missions. Additionally, when compared to their prior DOD block hours flown, this is a dramatic increase. NC1's DOD block hours increased 2,652% over original; NC3's increase was the least at 64.5%.

For the charter carriers, referencing back to the discussion of block hours and surge capability, these additional 277 missions likely would only slightly impact their

operation. For example, CP2, originally flying 14 aircraft 23,810 block hours essentially was utilizing 73.53% (reference figure 8) of their total block hours for DOD. Thus, 73.53% of their 14 aircraft equaled (73.53% of 14 equals 10.29 aircraft) 11 aircraft operating on behalf of DOD. If the additional 2,212 hours are added to CP2's original total, CP2 increases their overall DOD flown block hour total to 75.22%, which does not increase their total percentage of aircraft flown for DOD (75.22% of 14 equals 10.53, rounded up to 11 aircraft), identifying a likely, but minor, impact. Likewise, CP4's DOD block hour percentage equates to six aircraft (58.22% of nine equals 5.24 aircraft; 60.1% of nine equals 5.41 aircraft) before and after absorbing CP1's block hours. And these changes increased CP2 and CP4's percentage of DOD block hours by only 9.2 and 8.1% respectively. Due to the data limitation for CP3, this carrier was excluded from these equations.

Scenario 1b (S1b) – Passenger:

S1b maintained CP1 went out of business but this time their block hour time was allocated based upon CRAF participation (Table 7). Therefore NC1, which has roughly 25% of the overall CRAF Stage III commitment, received 25% of CP1's block hours; NC2, which has roughly 13% of the overall Stage III commitment, received 13% of CP1's block hours; CP2 has roughly 3% of Stage III commitment so they received 3% of CP1's block hours, and so on amongst all remaining "solvent" passenger air carriers.

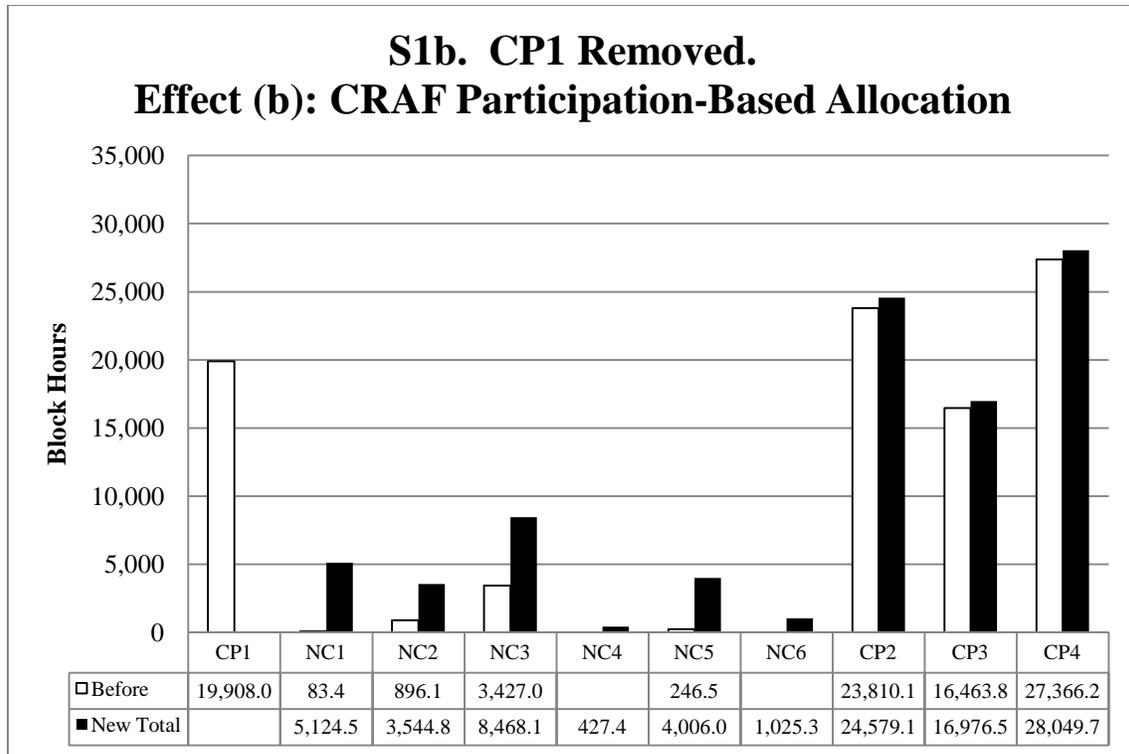


Figure 10. S1b. CP1 Removed. Effect (b): CRAF Participation-Based Allocation

Similarly to S1a above, this effect is felt by all the air carriers; however the CRAF participation-based allocation places a much larger impact upon the Network carriers due to their larger CRAF participation levels. Under effect (b), both NC1 and NC3 both need to generate an additional 5,041.1 block hours for the DOD to absorb the loss of CP1. Maintaining the simplified one mission equals 8+00 block hour means NC1 and NC3 must create 631 missions, likely resulting in the loss of 631 of their commercially scheduled missions; NC2 needs 2,648.7 additional block hours, or 332 missions, likely resulting in the loss of 332 commercially scheduled missions; and NC4 needs 427.4 more DOD block hours, likely resulting in the loss of 54 commercially scheduled missions.

For charter carriers, the minor impact as discussed with S1a above is lessened under effect (b), due to their limited CRAF participation. For example, CP2 would still

only fly 11 of their 14 aircraft for DOD missions, based on the percentage of block hours. CP2 at 23,810 flies 73.53% of their block for DOD equaling 11 aircraft; at 24,579, CP2 flies 74.15% for DOD, maintaining a 11 aircraft usage rate.

This scenario and effect help demonstrate why charter carriers typically accept a larger percentage of DOD missions, as is demonstrated in effect (c) below. Additionally, this scenario and effect should raise awareness that the loss of a carrier will likely more heavily impact NC operators who are typically slower to volunteer, thereby increasing the likelihood for CRAF activation.

Scenario 1c (S1c) – Passenger:

Finally, S1c simulated CP1 remained out of business but this time 70% of the lost carrier’s block hours was spread evenly among the remaining three passenger charter carriers and 30% was spread evenly among the nine network carriers (Table 7).

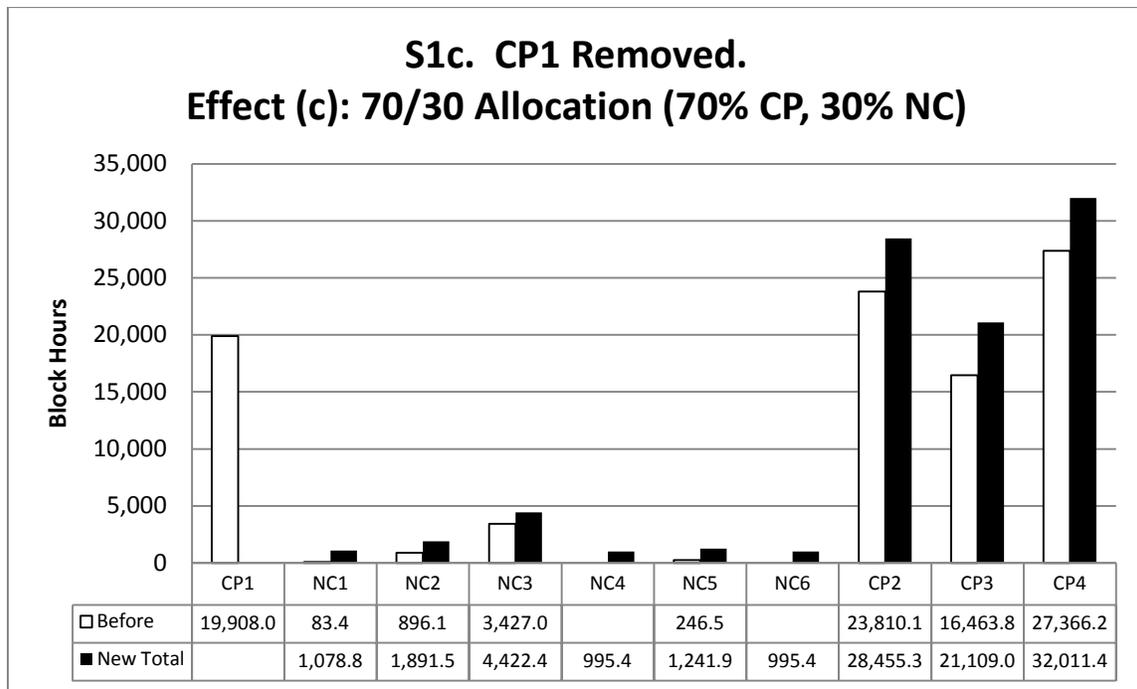


Figure 11. S1c. CP1 Removed. Effect (c): 70/30 Allocation

As with the previous scenarios, the loss of CP1 dramatically affects the remaining carriers yet demonstrates why the charter carriers accepting a larger percentage of DOD missions is acceptable, and perhaps preferable, to network carriers. In S1c, all network carriers must handle an additional 995.4 block hour, equaling 125 missions, likely resulting in the loss of 125 commercially scheduled missions. However, looking back, under S1a, NC1 needed 277 additional missions and under S1b, they needed 631 additional missions. Therefore, from the network carrier perspective, S1c would likely be their preferred option as it generates the smallest impact upon their scheduled service.

In S1c, charter carriers assume a larger increase in block hours of the three scenarios. However, this large increase, when translated into percentage of aircraft flying for DOD as previously discussed under surge capability, maintains aircraft levels. In each of the above scenarios, CP2 has essentially flown 11 of their 14 aircraft for the DOD. S1c's additional block hours upon CP2 increases their overall block hour percentage from the initial 73.53% to 76.85%, yet does not increase the number of aircraft (76.85% times nine aircraft equals 10.76).

As these scenarios have shown, the loss of any carrier would impact the remaining CRAF carriers. However, as shown, the loss does not have to be catastrophic, and a balanced response, such as effect (c), should allow for continued DOD peacetime operations short of CRAF activation.

Scenario 2 (S2):

As discussed previously and shown in Table 6 in S2, CP4 was identified as earning most of their revenue from the DOD, in terms of dollars. Thus, S2 assumed that

only CP4 did not fly their missions (therefore CP1, which was removed in S1, is back in business).

Scenario 2a (S2a) - Passenger:

To demonstrate the generalized impact of the loss of CP4, effect (a), an even allocation of CP4’s former block hours, was applied to the remaining carriers.

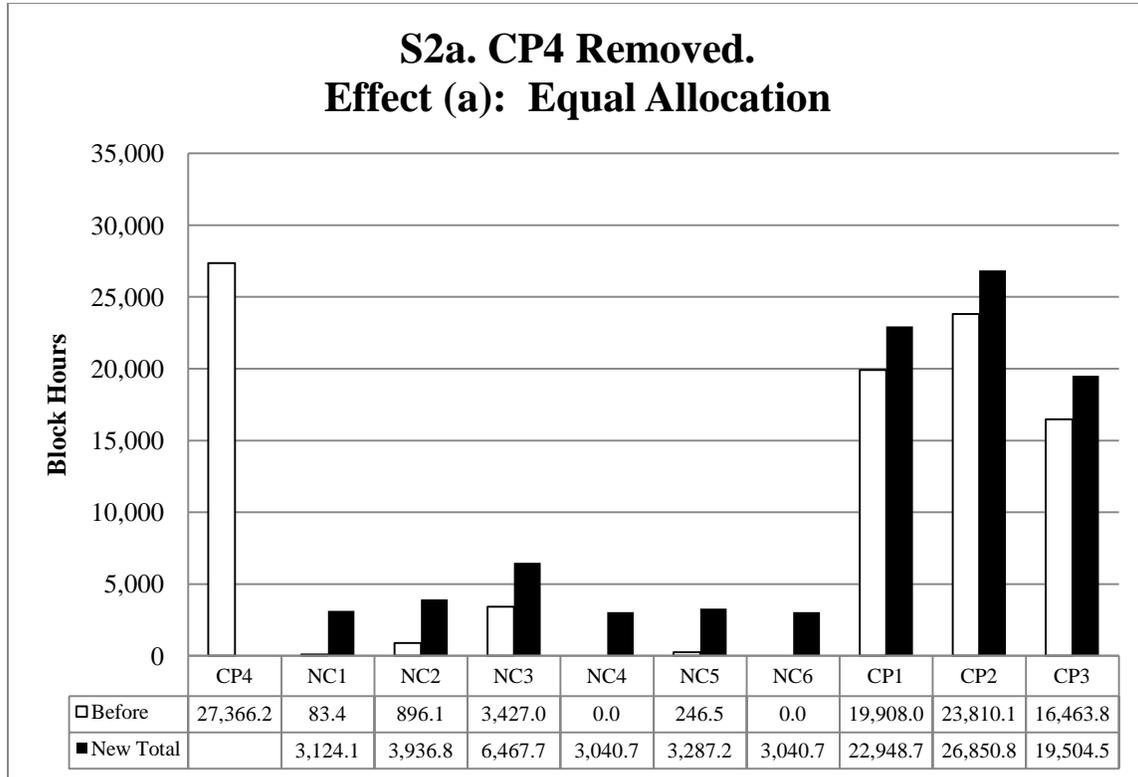


Figure 12. S2a. CP4 Removed. Effect (a): Equal Allocation

As seen previously, similar to S1a above, each carrier now must manage an additional 3,040.7 block hours, equal to an approximately 381 missions. As stated, for the network carriers, the likely result would be a loss of 381 commercially scheduled network missions.

A unique difference in this scenario comes into play due to the carrier removed. CP4 was removed due to their high amount of DOD revenue. The secondary effect of

that removal is the largest number of block hours was also removed. Therefore, the minimal impact upon the charter passenger carriers in regards to the percentage of their fleet flown for DOD is now a factor. CP1 operates nine aircraft. When they initially flew 19,908 block hours, or 76.3% of their block hour for DOD missions, this equaled seven aircraft essentially working for DOD. With the additional 3,040.7 block hour requirement, they would then fly 78.77% of their block hours for DOD. 78.77% of their nine aircraft pushes them to fly the eighth aircraft for DOD (78.77% of nine equals 7.09 aircraft). However, CP2 remained unaffected maintaining 11 of their 14 aircraft flew DOD missions (73.53% vs. 75.8% times 14 aircraft equals 10.29 and 10.61 aircraft, respectively).

Scenario 2b (S2b) - Passenger:

As discussed above in S1b, CP4's block hour time was divided based upon CRAF participation (Table 7).

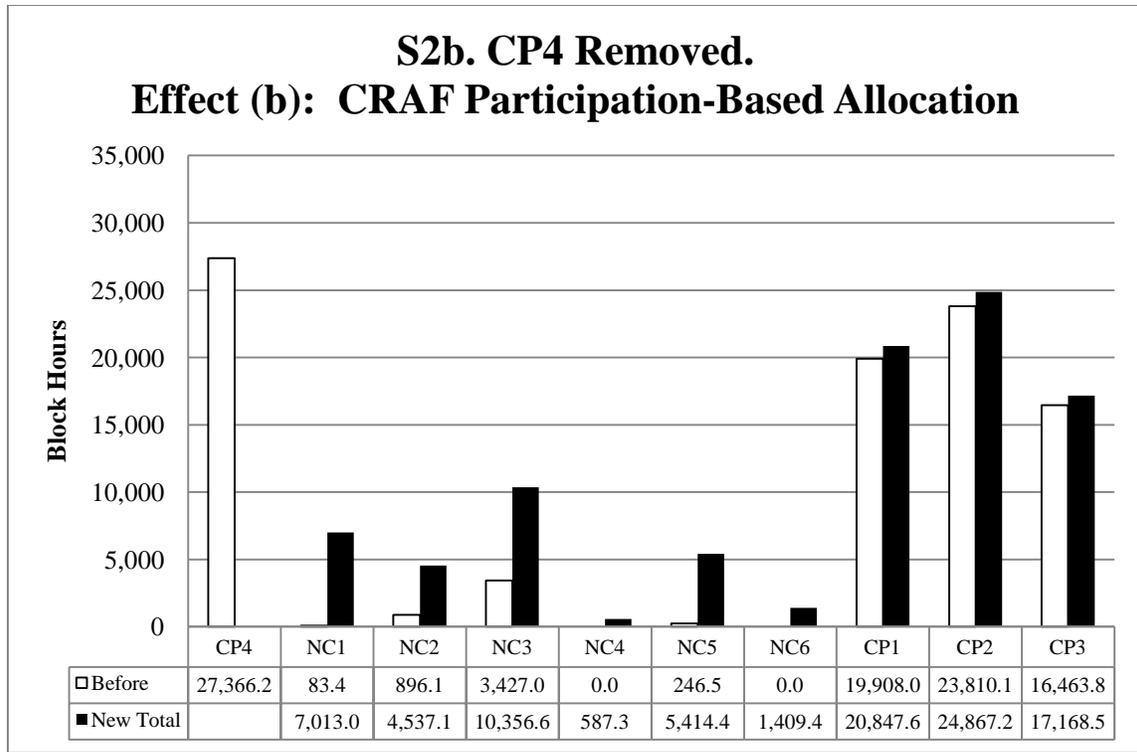


Figure 13. S2b. CP4 Removed. Effect (b): CRAF Participation-Based Allocation

As occurred in S1b above, in this scenario, the network carriers absorb the brunt of the impact. NC1 and NC3 again must deal with 6,929.6 more block hours, or 867 additional missions; NC2 wins 3,641 block hours for 456 more missions; NC4 gets 587.3 hours for 74 missions.

Similarly to above discussion, when taking the charter carrier's percentage of DOD block hours and translating it into actual aircraft usage for the DOD, CP1 remains at seven aircraft (76.3% of nine aircraft equals 6.87 aircraft; 77.12% of nine equals 6.94 aircraft) and CP2 remains at 11 aircraft (73.53% of 14 equals 10.29 aircraft; 74.37% equals 10.41 aircraft).

Under this scenario, the loss of 867 commercially scheduled network missions due to an increase in DOD missions would likely be met with strong resistance from

network carriers. Therefore, as seen in S2c, more volunteerism from the charter carriers would be required, or a possible activation.

Scenario 2c (S2c) - Passenger:

Again, S2c simulated CP4 remained out of business and 70% of their block hours was spread evenly among the remaining three passenger charter carriers and 30% was spread evenly among the nine legacy carriers (Table 7).

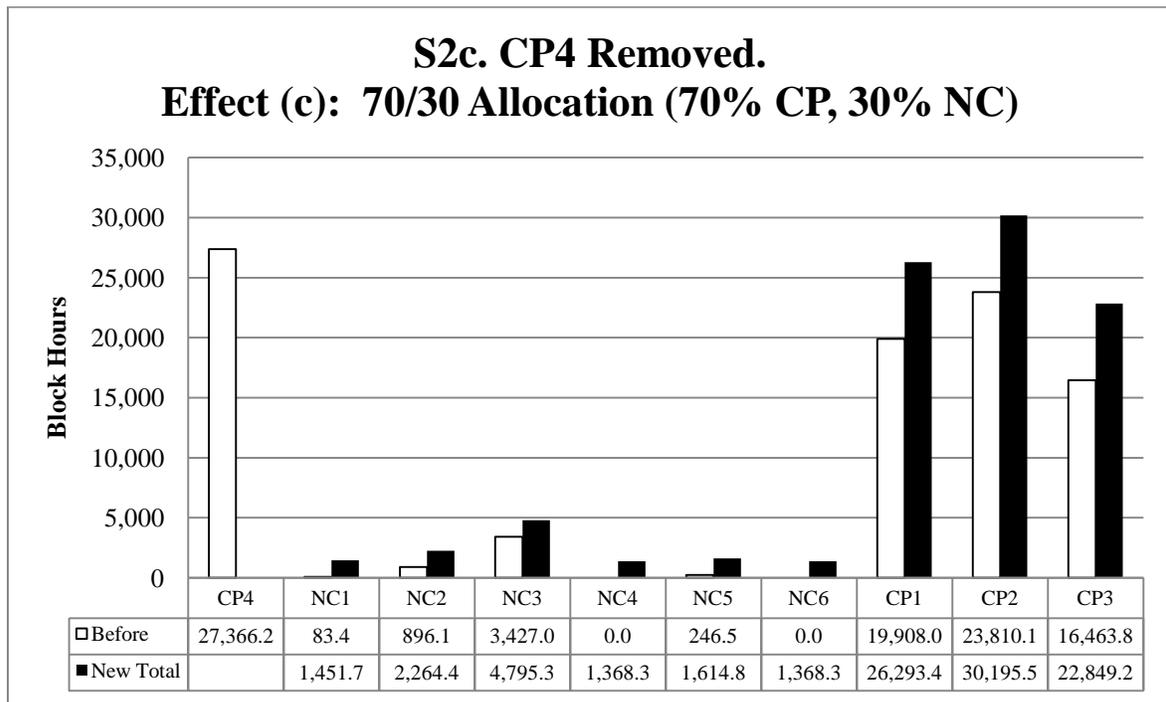


Figure 14. S2c. CP4 Removed. Effect (c): 70/30 Allocation

In this scenario, the network carriers absorbed 1,368.3 hours, likely losing 172 missions. However, as seen under scenario 1, from the network carrier perspective, this is still the best of the three options.

For charter carriers, CP1 increases their aircraft flying DOD block hours from seven to eight (76.3% of nine aircraft equals 6.87 aircraft; 80.96% of nine aircraft equals

7.29 aircraft), while CP2 is able to maintain aircraft usage of 11 (73.53% of 14 equals 10.29 aircraft; 77.89% equals 10.9 aircraft).

In all of scenario 2, the primary take away is that any carrier flying a large portion of DOD block hours that ceases places a larger impact upon the remaining carriers, which is an intuitive finding. Again, as with S1c above, effect (c) would likely be preferable to network carriers with minimal impact upon the charter carriers.

Scenario 3:

This scenario attempted to evaluate the worst case scenario of the loss of two charter passenger carriers and its implied affect upon the remaining carriers.

Scenario 3a (S3a) - Passenger:

Effect (a) was chosen to identify the generalized affect of both CP1 and CP4 ceasing operations.

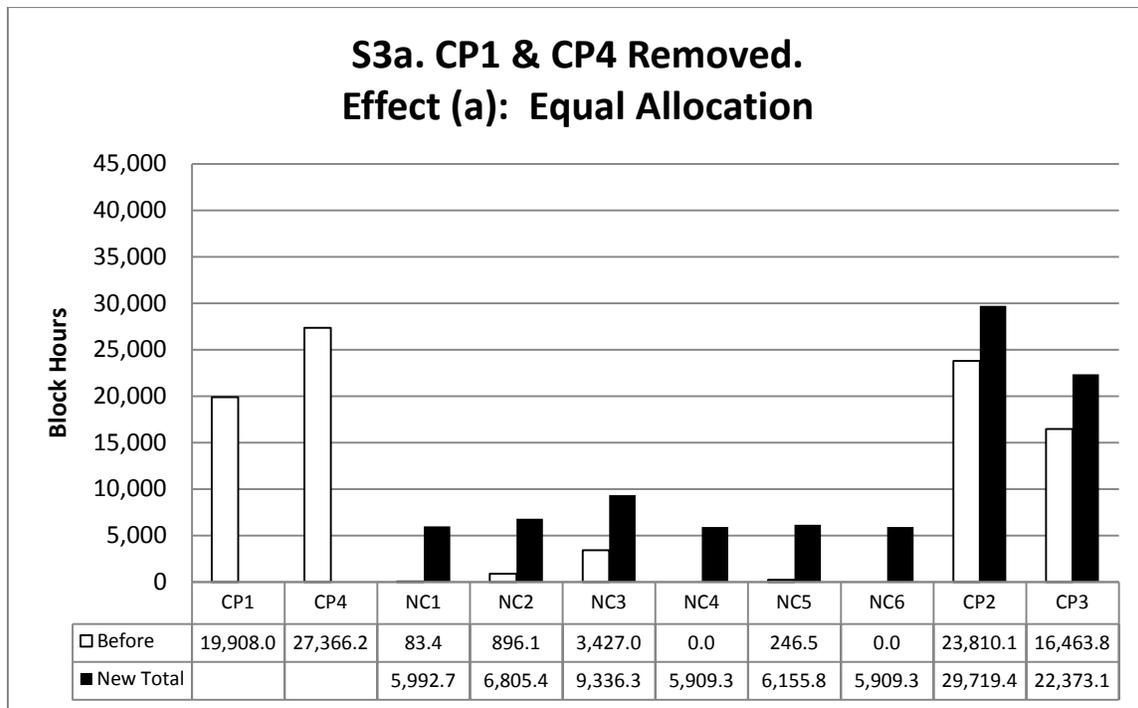


Figure 15. S3a. CP1 & CP4 Removed. Effect (a): Equal Allocation

As with all S#a scenarios, all carriers find themselves responsible for 5,909.3 additional hours, a likely 739 missions. For the CP2, this increase in hours will result in a jump from 73.53% of their block hours flown for DOD to 77.62%, yet still maintains 11 of 14 aircraft flying DOD block hours (10.87 aircraft).

Scenario 3b (S3b) - Passenger:

In this scenario, CP1 and CP4 cease operations and their block hours are redistributed according to the remaining carrier’s percentage of CRAF participation.

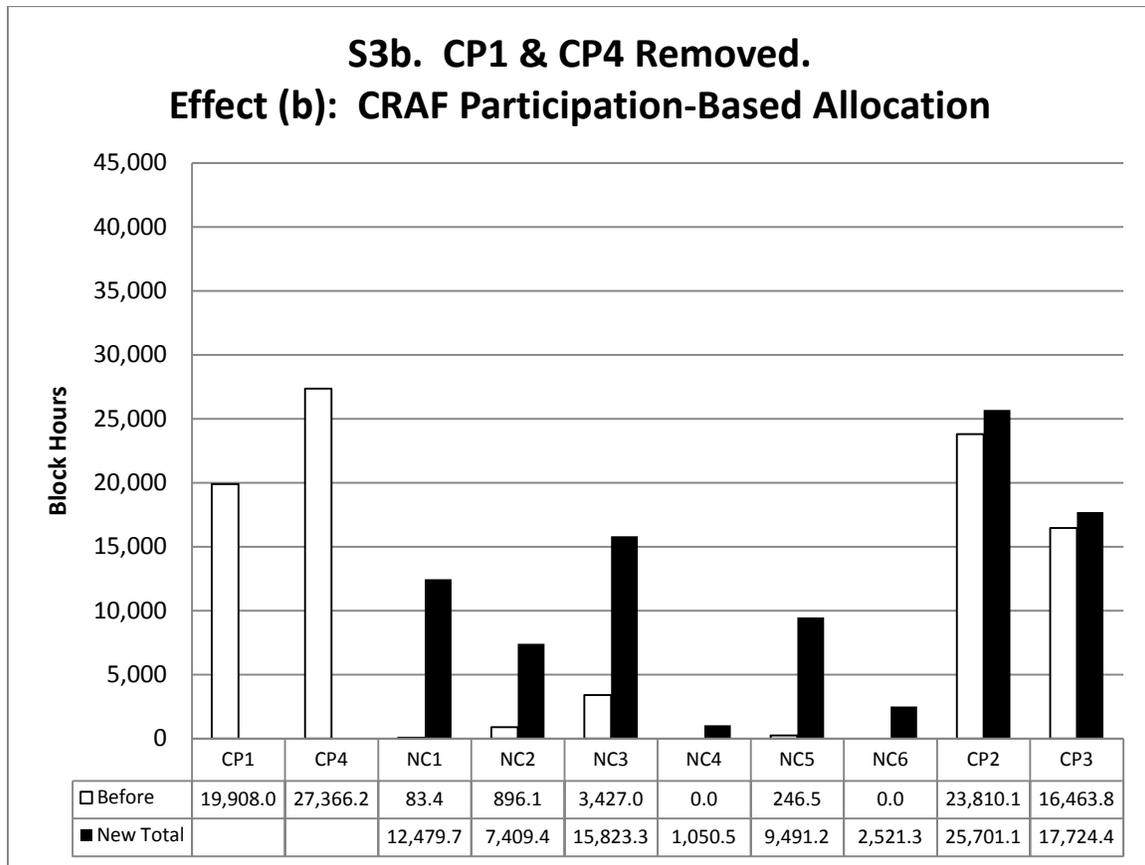


Figure 16. S3b: CP1 & CP4 Removed. Effect (b): CRAF Participation-Based Allocation

As under all S#b scenarios, the network carriers take in a majority of the new block hours. NC1 and NC3 have 12,396.3 additional block hours, a likely 1,550 missions; NC2 takes on an additional 6,513.3 block hours, or 815 missions; NC4 won

1,050.5 block hours for 132 missions; NC5 gets 9,244.7 new block hours, or 1,156 missions; NC6 earns 2,521.3 block hours, or 316 missions.

For the remaining charter carriers regarding the percentage of block hours translated to aircraft usage, CP2 can still handle their increased block hour percentage (73.53% vs. 74.99%) with 11 aircraft.

Scenario 3c (S3c) - Passenger:

CP1 and CP4 cease operation and their block hours are distributed 70% to the charter passenger carriers and 30% to the network carriers.

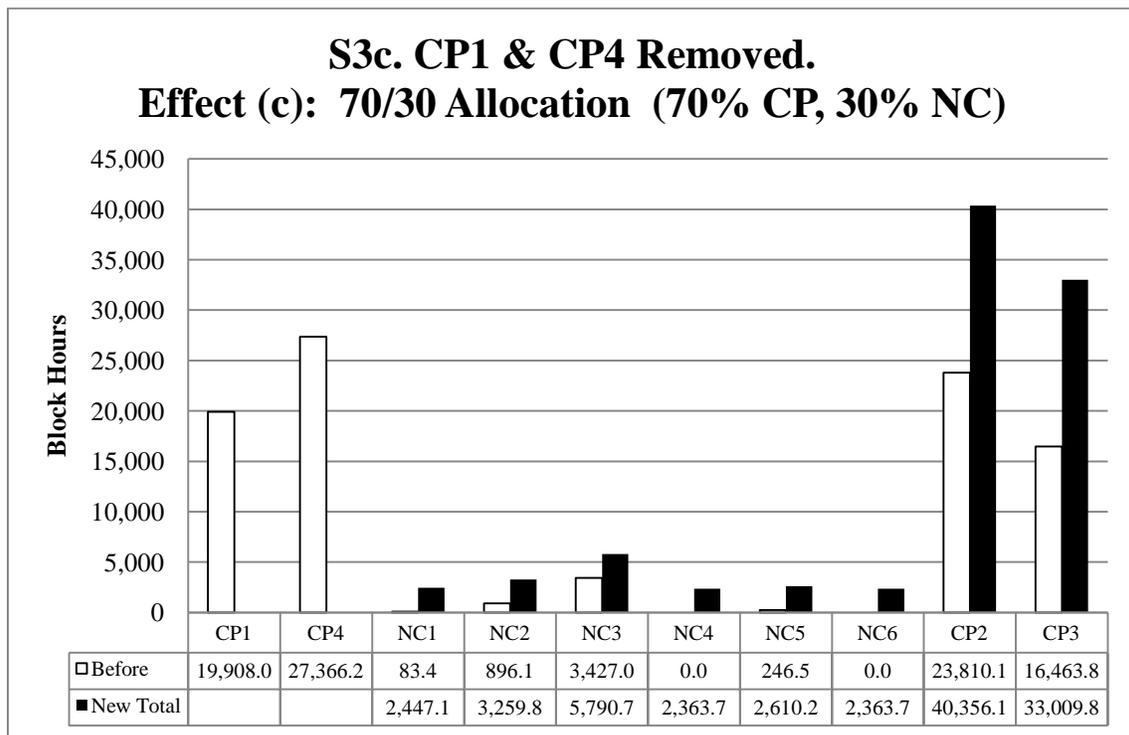


Figure 17. S3c. CP1 & CP4 Removed. Effect (c): 70/30 Allocation

Network carriers add 2,363.7 block hours for 296 additional missions. Charter carriers add 16,546.0 block hours. CP2's percentage of DOD aircraft will increase from 11 to 12 of their 14 (73.53% to 82.48%).

While difficult to project, under this scenario, CRAF activation is highly likely. This scenario still would likely be preferred by the network carriers, but a virtual doubling of block hours for the remaining charter carriers is likely unsustainable.

Scenario 1 (S1):

As conducted above, all nine scenarios were run for the cargo carriers as well. As previously discussed, due to a minuscule level of CRAF contribution, CC7 and CC9 were excluded in these scenarios and CC11 was excluded as it participated in charter passenger as well and separation of the data in GDSS2 was not possible. The various effects (a, b, c) were still translated as one mission equals 8+00 block hours, as discussed under the passenger scenarios above. For S1, CC5 was assumed to cease operations as they were the largest Revenue 60/40 Rule offender.

Scenario 1a (S1a) - Cargo:

CC5's block hours were redistributed equally among the remaining solvent integrated and charter cargo carriers.

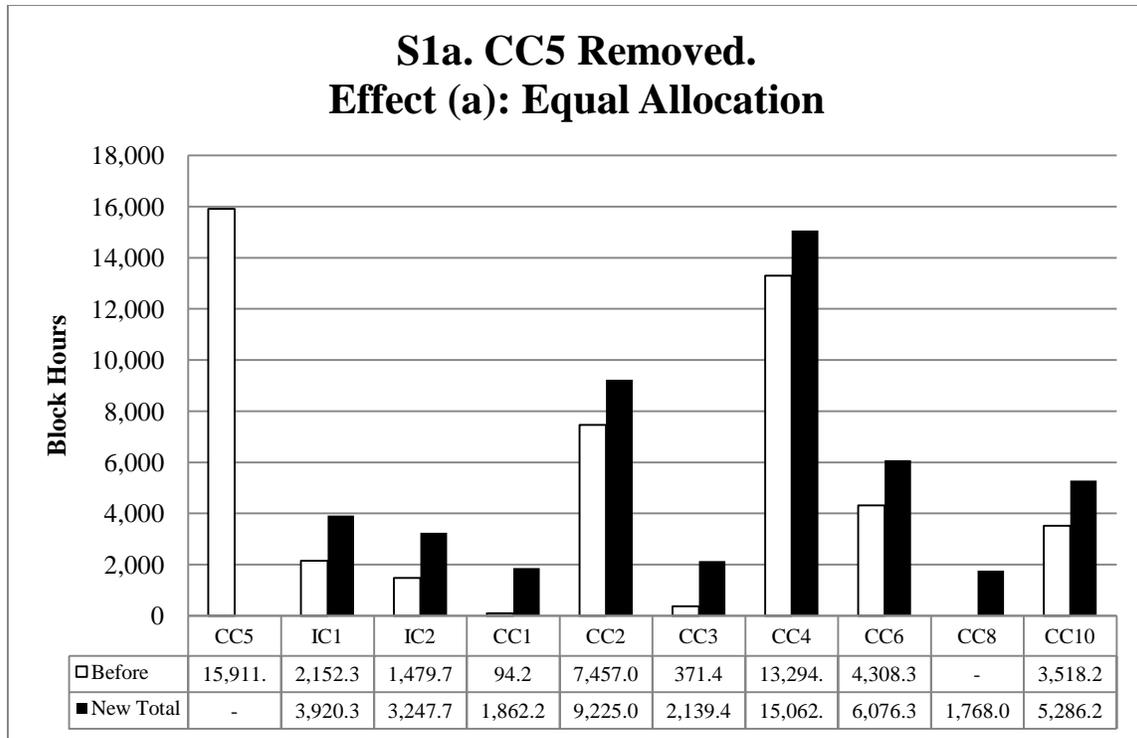


Figure 18. S1a. CC5 Removed. Effect (a): Equal Allocation

Every cargo carrier now has an additional 1,768.0 block hours on behalf of closed carrier, CC5, equaling 221 additional missions. As there is traditionally more flexibility within cargo air carriers, this addition may be absorbable.

Scenario 1b (S1b) - Cargo:

CC5's block hours are distributed among the remaining cargo carriers based upon their CRAF commitment levels.

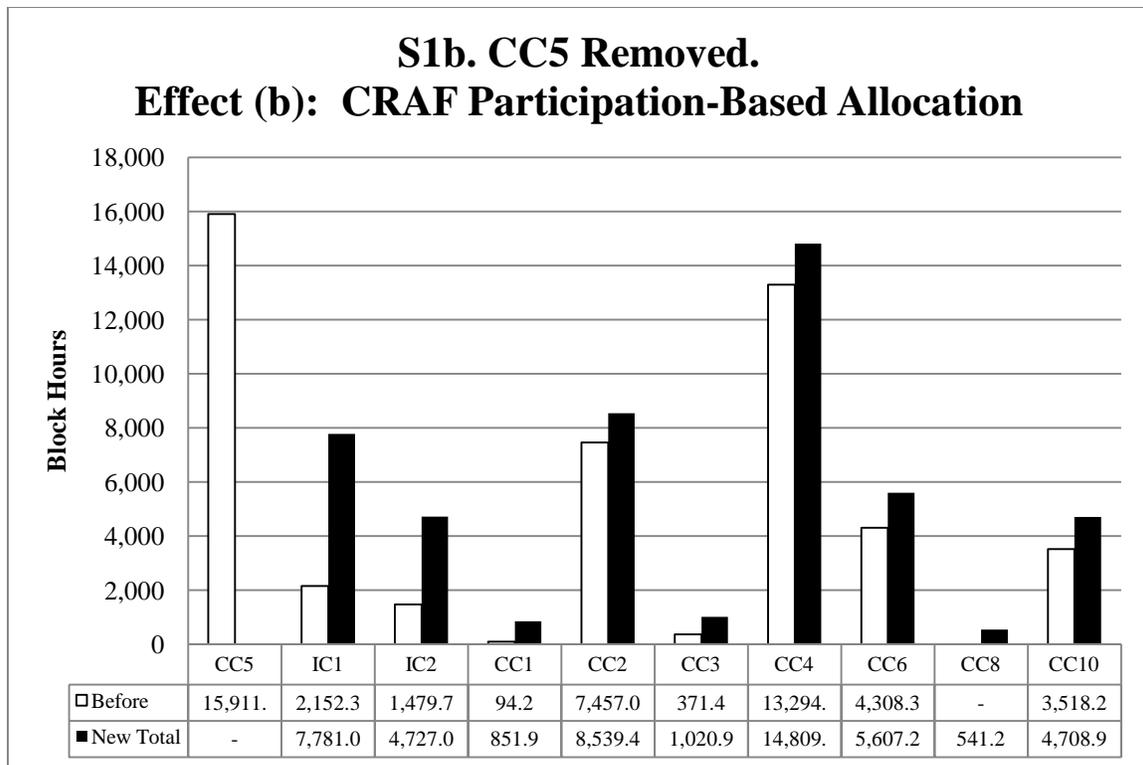


Figure 19. S1b. CC5 Removed. CRAF Participation-Based Allocation

Based upon their CRAF commitment, IC1 received the majority of CC5’s lost block hours, or 5,628.7 block hours, equaling 704 additional missions. IC2 was a close second with 3,247.3 block hours, or 406 new missions. For IC1 this represents an over 260% increase in their current DOD block hours and IC2 receives a 219% increase by block hours.

For the charter cargo carriers, CC4 received the largest increase of 1,515.4 block hours, generating 190 new missions, a 12% increase, and CC8 received the lowest increase of 541.2 block hours, or 68 new missions. Of note however is CC1’s 804% increase in block hour requirement.

In this scenario, for the charter carriers, it may be possible for them to absorb this additional influx of DOD block hours, but highly unlikely for the integrated carriers.

Scenario 1c (S1c) - Cargo:

Similar to S1c – Passenger, the integrated cargo carriers, much like the network passenger carriers, have limited flexibility and therefore the charter carriers would be more likely to absorb any lost block hours due to the demise of a competitor, in this scenario, CC5.

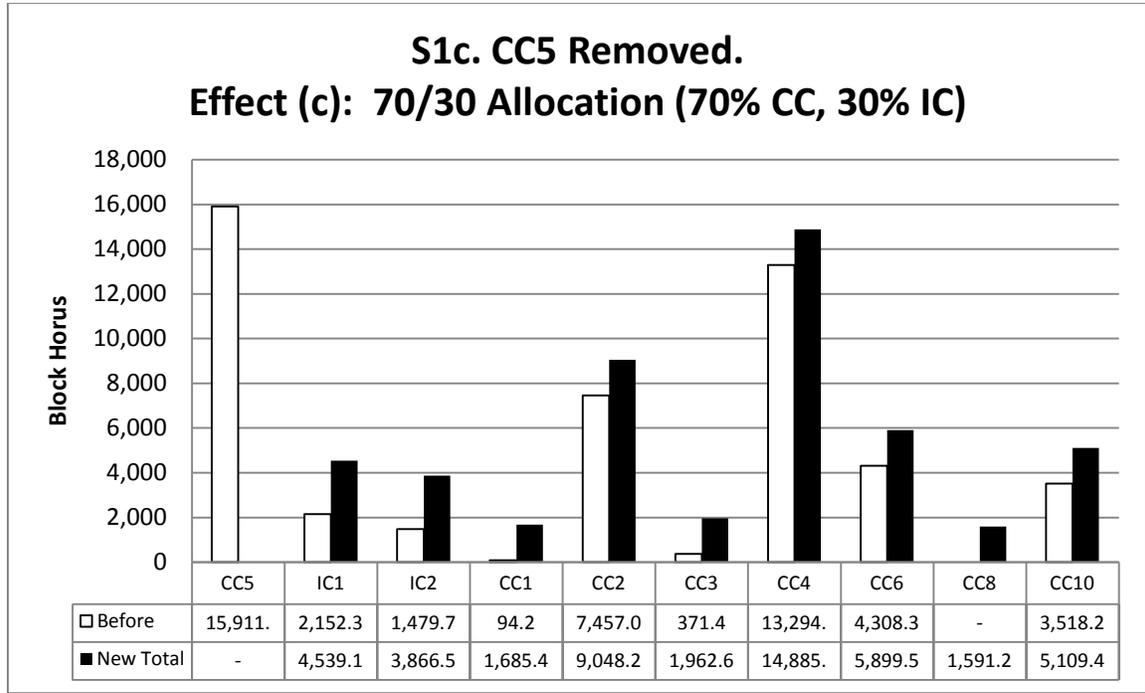


Figure 20. S1c. CC5 Removed. Effect (c): 70/30 Allocation

The integrated carriers received the majority of the lost block hours, 2,386.8 block hours each, likely adding 299 new missions, increasing IC1’s DOD block hours by 110% and IC2 by 161%. The charter carriers each received 1,591.2 new block hours, or roughly 199 new missions. While the charter carriers again hold less of the demand, the 1,689% increase between what CC1 was performing and may have to perform is astronomical and likely unachievable.

In spite of prior discussions of the flexibility of the cargo segment, this scenario demonstrates that losing one major cargo carrier potentially places unachievable requirements upon the remaining cargo carriers. If this were to occur, the DOD would likely be left with no option but CRAF activation.

Scenario 2 (S2):

In these scenarios, CC4 was selected to cease operations as it received the largest amount of revenue from DOD, in dollars.

Scenario 2a (S2a) - Cargo:

Similarly to S1a, CC4's block hours are distributed evenly among the remaining carriers.

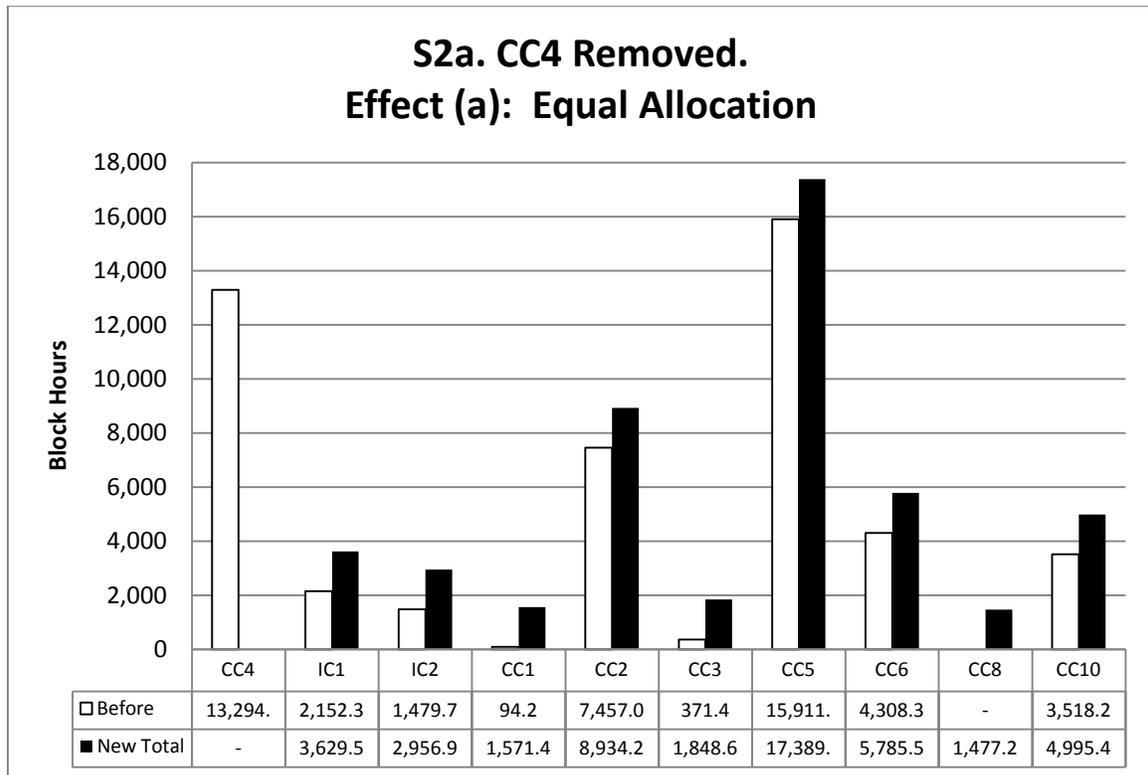


Figure 21. S2a. CC4 Removed. Effect (a): Equal Allocation

All cargo carriers receive additional 1,477.2 block hours, roughly 184.6 new missions. Notably in this scenario, IC1 and IC2 increase their DOD block hours 68.6 and 99.8%, respectively and the charter carriers increase their current DOD block hours anywhere between a high of 1,568% (CC1) to a low of 9.3% (CC%).

Scenario 2b (S2b) - Cargo:

CC4's block hours are distributed among the remaining carriers based upon the percentage of their CRAF commitment to Stage III.

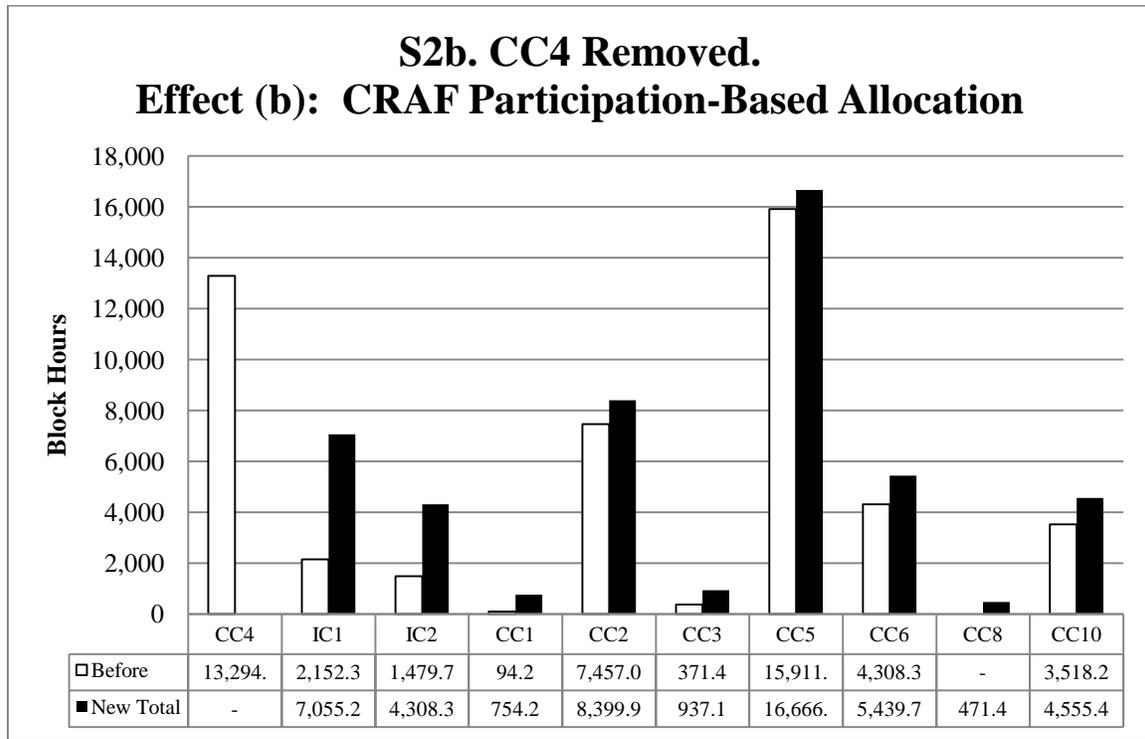


Figure 22. S2b. CC4 Removed. Effect (b): CRAF Participation-Based Allocation

As the largest cargo participant in CRAF, IC1 would receive an additional 4,902.9 block hours, or 613 missions, a 227% increase in their DOD block hour work. As the second largest, IC2 would add 2,828.6 block hours, or 354 missions, a 191% increase.

As with the other scenarios, the charter carriers vary widely. CC6 received the biggest increase in pure block hours, 1,131.4 hours, roughly 142 missions, which only

equated to a 26.2% increase in DOD block hour work. CC1 once again received the highest increase in block hour work at 700%, adding 660.0 hours, or 83 missions. The smallest percentage of block hours change was CC5 at 4.7%.

Scenario 2c (S2c) - Cargo:

S2c splits CC4’s block hours 70% for the cargo carriers and 30% for integrated carriers.

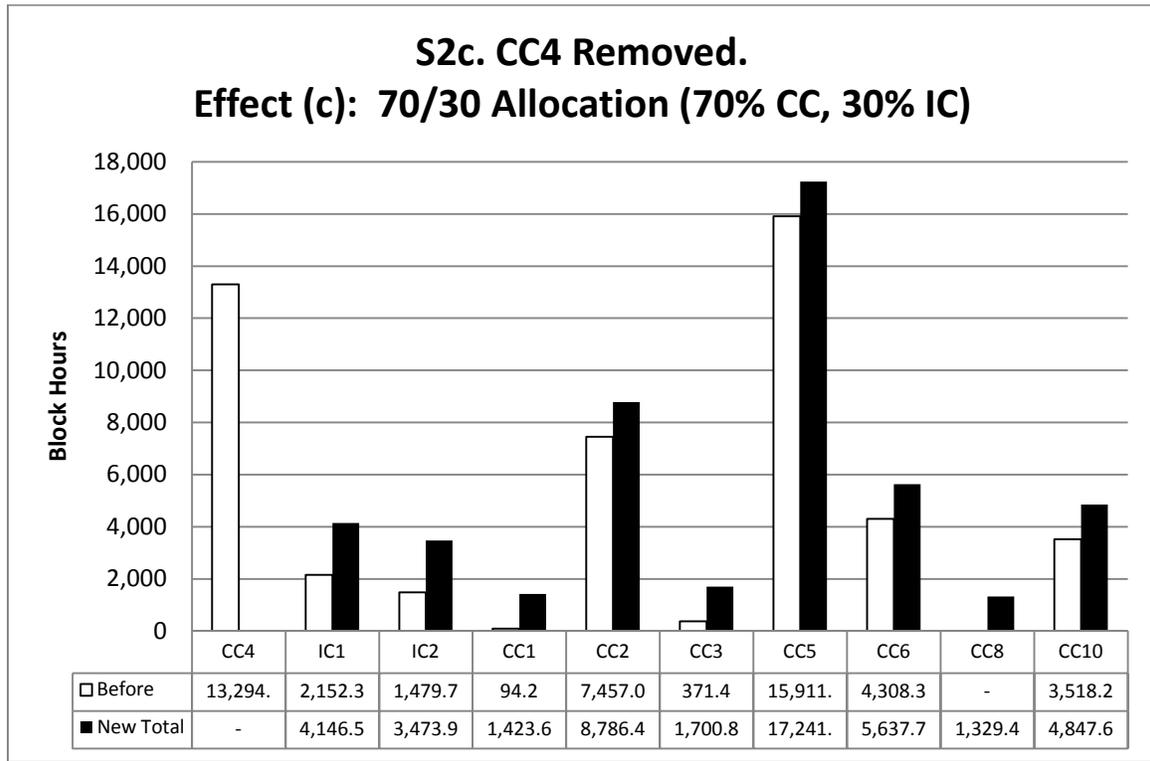


Figure 23. S2c. CC4 Removed. Effect (c): 70/30 Allocation

In this scenario, the integrated carriers block hours increased 1,994.2, generating 250 additional missions. For IC1, this was a 92.6% increase above their prior DOD block hour time and a 134.7% increase for IC2.

Once again, the impacts upon the charter carriers are diverse from a 1,411% increase in DOD block hour work for CC1 to an 8.4% increase for CC5.

As with all S1 scenarios, the S2 scenarios show the loss of one major cargo carrier will likely drastically, and differently, impact the remaining carriers. Regardless of which effect utilized (a, b, or c), during this type of heavy DOD usage, the loss of a major carrier is likely unrecoverable via volunteerism, which increases the likelihood of CRAF activation.

Scenario 3 (S3):

As shown above, S1 and S2 demonstrate possible dramatic issues upon the remaining CRAF carriers. Not to be outdone, S3 was the summation of the bad of S1 and the bad of S2.

Scenario 3a (S3a) - Cargo:

CC4 and CC5 cease operations and their block hours are distributed among the remaining solvent cargo carriers.

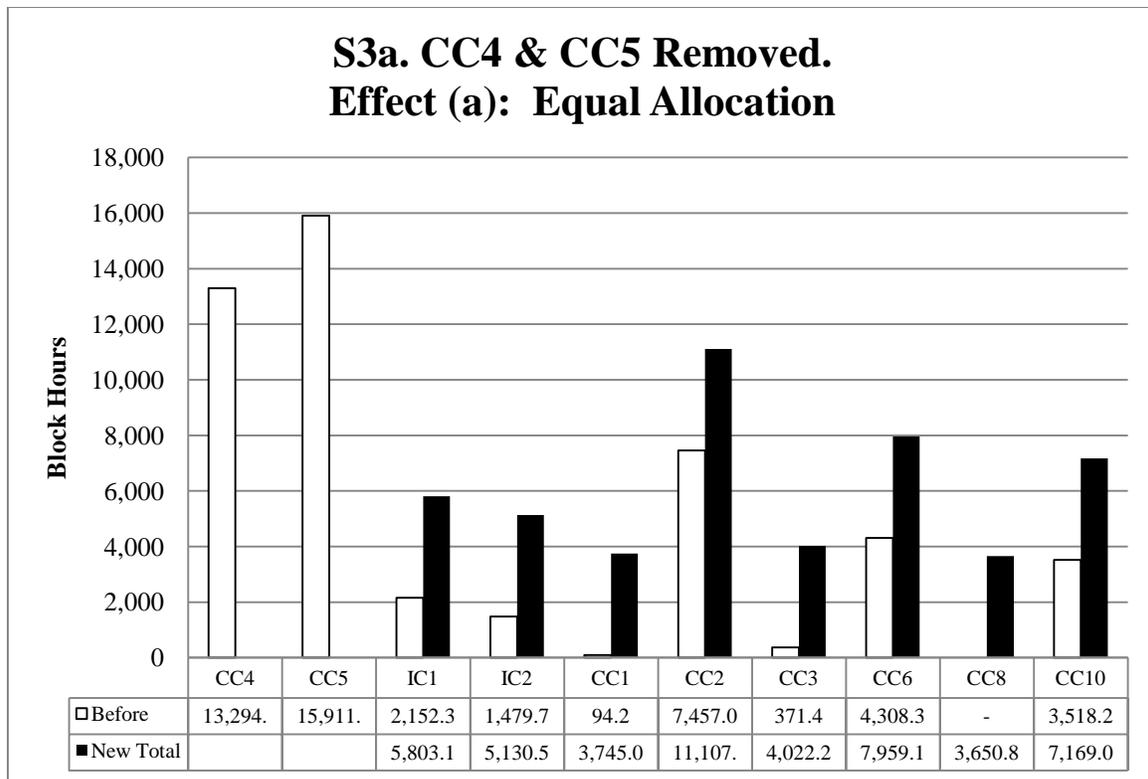


Figure 24. S3a. CC4 & CC5 Removed. Effect (a): Equal Allocation

With CC4's and CC5's cessation of operation, each carrier's block hours increased 3,650.8, generating 457 new missions. For IC1, this was a 169% increase in DOD block hours; IC2 earned a 246% increase; CC1 received an astronomical 3,876%. The most apt to handle this drastic change would have been CC2 with a "minor" increase of 49% in DOD block hours.

Scenario 3b (S3b) - Cargo:

This scenario distributes the lost block hours by CRAF Stage III participation percentage.

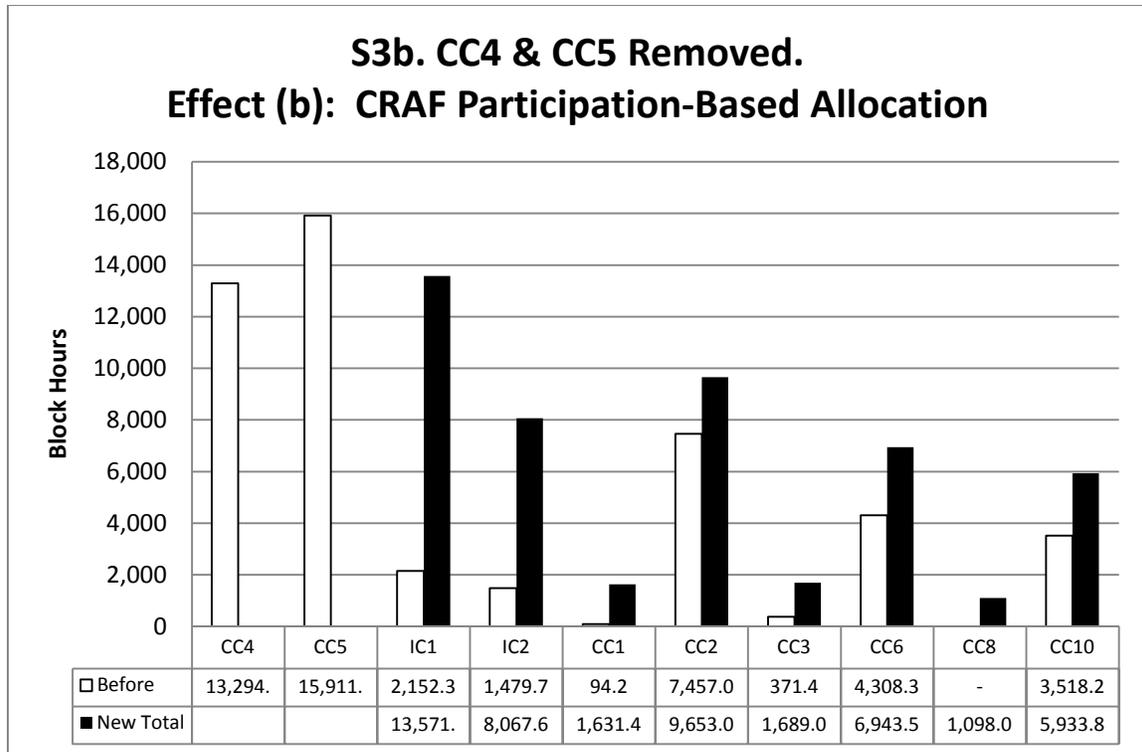


Figure 25. S3b. CC4 & CC5 Removed. Effect (b): CRAF Participation-Based Allocation

The resulting increase in block hours is significant for all carriers in this scenario.

IC1 received a 530% increase in DOD block hours and IC2 earned 445% increase.

Without carrying this scenario much further, it is reasonable to state that neither integrated carrier has the capability to cover these losses under effect (b).

The charter cargo carriers do not fair much better. Again, CC2 is the best case with a perhaps manageable 29.4% increase, adding 2,196.0 block hours for 275 missions.

Scenario 3c (S3c) - Cargo:

This scenario shares CC4 and CC5's lost block hours 70% with the charter carriers and 30% with the integrated carriers.

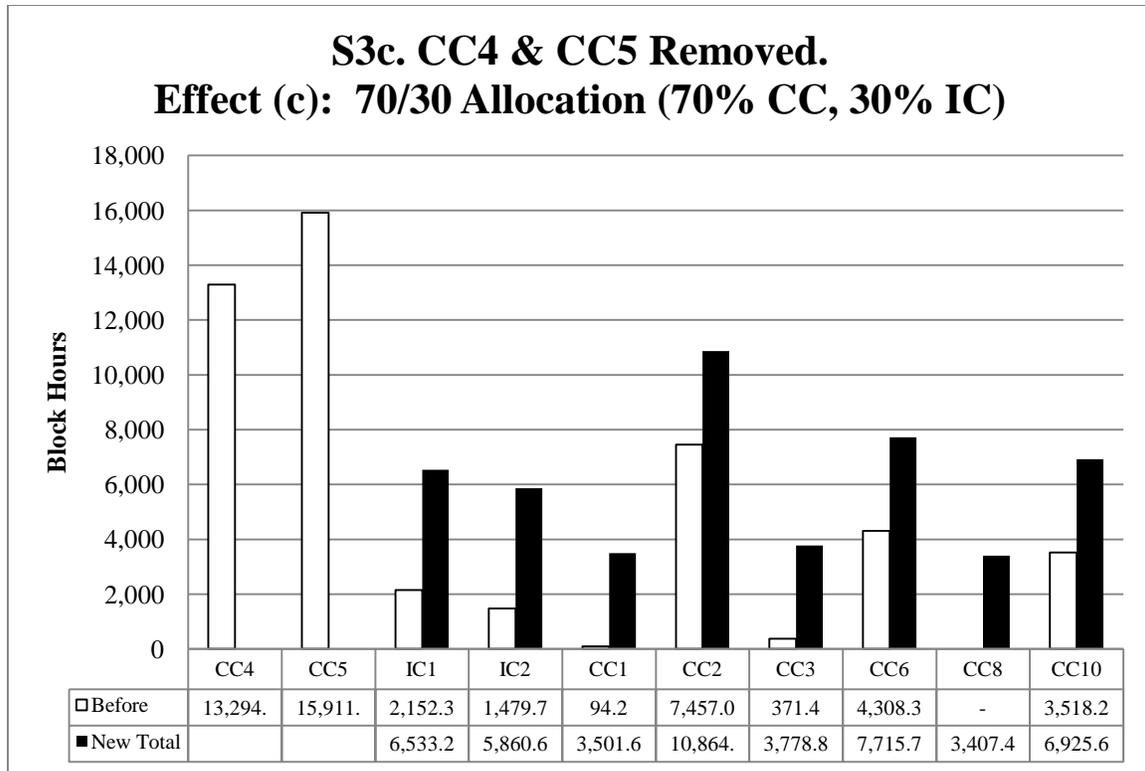


Figure 26. S3c. CC4 & CC5 Removed. Effect (c): 70/30 Allocation

The integrated carriers both add 4,380.9 block hours, or 548 missions, a 203% increase for IC1 and a 296% increase for IC2.

The charter carriers again do not perform well, all increasing 3,407.4 block hours, or 426 missions. CC1's 3,617% increase is likely impossible for them to achieve and even CC2's 45.7% increase in DOD block hours may not be achievable without CRAF activation.

Scenario Summary

Together, these scenarios highlight the precarious balance of CRAF participation and the potential pitfalls of a lost carrier. Regardless of the scenario, passenger or cargo, these collectively show the loss of one carrier limits the possibility for volunteerism thereby bringing activation closer to reality. Additionally, from a DOD perspective,

attempts to dictate “how” the carriers should respond needs to be handled delicately. These scenarios show that even dispersal based upon CRAF Stage III participation, while perhaps the most “fair”, it is likely the most damaging to those carriers that represent a majority of CRAF assets. Finally, these scenarios show that overreliance upon one carrier is potentially damaging to DOD airlift as a whole. While all DOD carriers are regularly evaluated, DOD cannot prevent a carrier from cessation of operations, punishment by the CARB, or a carrier’s self-removal from DOD operations. As shown, the loss of a single carrier, especially the “wrong” carrier, has potentially catastrophic consequences.

V. Recommendations and Conclusion

The DOD and air carrier relationship within the CRAF is key to the overall success of DOD mission. This relationship needs consistent attention and a balanced approach. An overreliance upon DOD dollars is not in the carriers or DOD's best interest, as discussed throughout this paper. DOD needs to maintain a healthy airlift and surge capability that CRAF provides; CRAF air carriers need to stay competitive in both high and low-DOD expenditure periods. A key method to maintain this healthy balance is through the implementation of a Block Hour 60/40 Rule.

As shown, a Block Hours 60/40 Rule will have less dramatic impact upon the charter carrier's financial picture as many will still be allowed to earn over 50% of their revenue from DOD sources, yet retain a commercial customer base. Also, enforcement of the Block Hour 60/40 Rule will encourage those overly dependent carriers to seek non-DOD business now, preparing them for the upcoming reduced DOD expenditures, yet leave them viable for future CRAF needs. During the forecasted drawdown years (FY11-FY15), this will allow for a gradual transition for the air carriers.

This Block Hour 60/40 Rule should be phased in from FY11-FY15 so that, by the expected end of the drawdown in FY15, all air carriers have time to adhere to the rule. Tables 8 and 9 display the current Block Hour 60/40 Rule offenders and their percentage of DOD Block Hours (Annual 60/40 Column). Additionally, a 2-year smoothing factor is included for consideration in the event DOD leaders are interested in a more aggressive

timeline than is recommended below, but interested in still promoting a gradual shift to the new rule.

Based upon these numbers, a recommended Block Hour (adjusted) Rule would be: FY11-12: Block Hour 25/75 Rule; FY13-14: Block Hour 50/50 Rule; FY15: Block Hour 60/40 Rule. According to these tables, the passenger charter carriers will need minimal adjustments over FY11-12 to meet the Block Hour 25/75 Rule and cargo charter carriers are already there. This gradual transition serves two primary purposes: One, it provides adequate time for carriers to gradually transition themselves away from their heavy DOD dependence and two, it gives the carriers a steady-state, longer term forecast.

Table 8. Passenger Charter Block 60/40 Percentages

Carrier	DOD Block Hr:	Total Block Hr	Annual 60/40	DOD Block Hr:	Total Block Hr	Annual 60/40
	FY10			FY09		
CP1	19,908.0	26,092.0	76.3%	22,348.4	27,794.0	80.41%
CP2	23,810.1	32,381.0	73.5%	22,234.3	31,542.0	70.49%
CP3	16,463.8	15,166.0	108.6% ¹	10,349.3	12,066.0	85.77%
CP4	27,366.2	47,001.0	58.2%	24,338.0	58,278.0	41.76%
Totals:	87,548.1	120,640.0	72.57%	79,270.0	129,680.0	61.13%
2-yr smoothing:		FY10-09:	66.64%		FY09-08:	54.30%
	FY08			FY07		
CP1	20,451.7	33,099.0	61.79%	13,326.2	33,538.0	39.73%
CP2	18,045.4	34,900.0	51.71%	13,222.1	29,040.0	45.53%
CP3	4,240.9	13,984.0	30.33%	1,328.5	20,532.0	6.47%
CP4	23,924.5	57,102.0	41.90%	16,463.0	56,044.0	29.38%
Totals:	66,662.5	139,085.0	47.93%	44,339.8	139,154.0	31.86%
2-yr smoothing:		FY08-07:	39.89%			--

Note: This table does NOT account for the less than 1% of block hours flown by network carriers. The researcher is assuming network carriers will maintain this low participation level.

¹ Data Error

Table 9. Cargo Charter Block 60/40 Percentages

Carrier	DOD Block Hr:	Total Block Hr	Annual 60/40	DOD Block Hr:	Total Block Hr	Annual 60/40
	FY10			FY09		
CC1	94.2	45,164.0	0.21%	83.7	54,658.0	0.15%
CC2	7,457.0	25,482.0	29.26%	7,898.0	23,239.0	33.99%
CC3	371.4	8,069.0	4.60%	401.9	19,204.0	2.09%
CC4	13,294.4	80,250.0	16.57%	13,918.9	73,823.0	18.85%
CC5	15,911.9	27,893.0	57.05%	15,393.8	21,237.0	72.49%
CC6	4,308.3	30,168.0	14.28%	1,985.2	25,637.0	7.74%
CC7 ¹	--	--	--	--	--	--
CC8	0.0	30,318.0	0.00%	0.0	31,450.0	0.00%
CC9 ¹	--	--	--	--	--	--
CC10	3,518.2	46,375.0	7.59%	2,842.5	L/D ²	--
Totals: 2-yr smoothing:	44,955.4	293,719.0	15.31%	39,681.5	249,248.0	15.92%
		FY10-09:	15.59%		FY09-08:	13.10%
	FY08			FY07		
CC1	0.0	104,582.0	0.00%	56.1	101,217.0	0.06%
CC2	6,554.8	21,269.0	30.82%	5,643.9	25,455.0	22.17%
CC3	373.3	39,583.0	0.94%	633.9	42,694.0	1.48%
CC4	16,261.1	98,302.0	16.54%	13,978.5	108,428.0	12.89%
CC5	14,816.8	23,244.0	63.74%	14,042.7	28,290.0	49.64%
CC6	2,239.4	33,704.0	6.64%	2,473.7	59,754.0	4.14%
CC7 ¹	--	--	--	--	--	--
CC8	27.1	40,178.0	0.07%	36.9	38,352.0	0.10%
CC9 ¹	--	--	--	--	--	--
CC10	2,192.0	L/D ²	--	205.7	L/D ²	--
Totals: 2-yr smoothing:	40,272.5	360,862.0	11.16%	36,865.7	404,190.0	9.12%
		FY08-07:	10.08%			--

Note: This table does NOT account for the less than 1% of block hours flown by integrated cargo carriers. The researcher is assuming these carriers will maintain this low participation level.

¹ Excluded due to lack of peacetime missions and <.01% CRAF participation.

² Lack of Block Hour data in BTS for this carrier.

Additionally, the Block Hour 60/40 Rule, or any rule, needs to be clearly communicated to the air carriers. One regular complaint about the Revenue 60/40 Rule is carriers are unaware of when it is and is not being enforced (Costello et al, 2009; GAO, 2009:5, 16-17). DOD can help ease their own pain by clearly stating the rules and clearly stating when the rules are or are not enforced (such as during a CRAF activation or peak demand period).

Additional studies

This study briefly touched on one small piece of CRAF. CRAF is a constantly changing enterprise, notably as carriers try to balance an active DOD role with non-DOD commercial interests. A follow up study to this regarding how the Block Hour 60/40 Rule is actually working would be recommended.

Another area of interest for DOD and AMC leaders that was only touched on in this study is the design of CRAF teams and their arrangements. As with everything, there are plusses and minuses and DOD should have a clear understanding of what the purpose and goals of CRAF are. Within that framework, before making any major changes, DOD should attempt to clearly understand 1) what teams are, 2) what teams currently provide, 3) advantages and disadvantages of teams and 4) what the second and third order effects are likely to be if teams are changed.

Finally, a study on who should maintain the surge capability would be of possible interest. The question could be asked, should DOD rely more heavily on day to day commercial airlift operations? If some of the charter carriers had their way, they would receive a larger fixed buy which would help them provide for better long-range planning and forecasting (Costello et al, 2009). For this to occur, a DOD shift in mindset may

need to occur, one where commercial carriers perform a larger percentage of day to day missions and organic assets will handle the surged missions. In other words, during times of peace, the commercial carriers will fly their regular, contracted mission sets and organic assets will either sit on the ramp or conduct local training. Then during war time, commercial assets will continue their regular, contracted mission and organic assets will handle the surges.

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Appendices

Appendix 1: NC Revenue and Block Hour Data Sheet.

FY	Revenue			BLOCK HOURS												DOD TTL HRS	TTL HRS (BTS)	BLOCK 60/40			
	DOD	TTL Comm	60/40	O	N	D	J	F	M	A	M	J	J	A	S						
NC1 2010	1,361,119.87	21,626,547,000	0.01%	63.8			5.1	4.2		3.3					7			83.4	2,156,851	0.00%	
NC1 2009	515,115,892.00	20,307,986,000	2.54%	19.7		1.2	2.7	10.5		36.4				11.3		16.6		98.4	2,171,632	0.00%	
NC1 2008	389,650,697.00	23,885,756,000	1.63%	5			2.9			6.4				7.7		7.5		29.5	2,373,072	0.00%	
NC1 2007	448,574,350.00	22,554,473,000	1.99%					20.5		6.3			36.4		15.3			78.5	2,411,182	0.00%	
NC2 2010	9,156,233.26	13,713,766,000	0.07%	257.7		36	151.8		150.6		43		140.7		116.3			896.1	1,264,274	0.07%	
NC2 2009	1,742,101.58	12,640,560,000	0.01%	73.6		19.2	49.2		68.7		63.9		180.7		161.4			616.7	1,318,041	0.05%	
NC2 2008	13,847,750.22	15,108,176,000	0.09%	104		9.5	44.4		31.9		378.8		209.9		118.2			896.7	1,490,367	0.06%	
NC2 2007	6,834,662.95	13,747,098,000	0.05%				15.2					5.9				163		184.1	1,485,316	0.01%	
NC3 2010	55,817,017.27	28,530,245,000	0.20%	246.6		45	139.2		714.3		648.2		756.2		375.7			2,925.2	2,442,306	0.12%	
NC3 2009	8,157,422.12	18,436,317,000	0.04%	24.4		5.8	16.6		96.1		97.8		167.8		214.5			623.0	1,698,474	0.04%	
NC3 2008	10,335,344.11	20,847,959,000	0.05%	162.4		98.6		128.7		136.3		98.5			33.7			658.2	1,763,001	0.04%	
NC3 2007	4,960,735.62	18,709,584,000	0.03%				2		3.7			4.2				2.8		12.7	1,743,676	0.00%	
NC3 2010	8,941,720.10	2,673,571,000	0.33%	391.9		5.1	104.8											501.8	232,850	0.22%	
NC3 2009	118,693,499.08	11,391,199,000	1.04%	472.2		378.1	500.6		1248		1206.2		891.4		1348.6			6,045.1	1,046,719	0.58%	
NC3 2008	61,622,796.97	14,083,549,000	0.44%	164.5		165.9	190.9		472.8		532.8		381.9		389.3			2,298.1	1,220,511	0.19%	
NC3 2007	8,099,560.71	12,537,149,000	0.06%				107.1		46.6			130.8		21		56.4		361.9	1,291,719	0.03%	
NC5 2010	7,237,095.57	19,012,234,000	0.04%	128.4		31.3	86.8											246.5	1,444,753	0.02%	
NC5 2009	27,267,154.61	16,697,466,000	0.16%	464.5		85.8	240.5		67.2									89.1	947.1	1,539,911	0.06%
NC5 2008	19,859,784.34	20,662,331,000	0.10%							177.4		248.8			295.6			721.8	1,808,256	0.04%	
NC5 2007	10,996,250.20	19,662,610,000	0.06%															-	1,859,901	0.00%	

Appendix 2: CP Revenue and Block Hour Data Sheet.

FY	Revenue			BLOCK HOURS												DOD TTL HRS	TTL HRS (BTS)	BLOCK 60/40		
	DOD	TTL Comm	60/40	O	N	D	J	F	M	A	M	J	J	A	S					
CP-1 2007	249,448,617.99	506,480,833	49.25%					3055.8		3031		3099.5		2379.1		1709.8		13,275.2	101,485	13.08%
SR1 ² 2010	29,648,204.39	154,113,683	19.24%			503.1	241.2	203.4		317.6		615.7		387.7		290.8		2,559.5	15,176	16.87%
SR1 ² 2009	42,489,800.95	162,612,530	26.13%			413.2	183.3	403.2		430.6		544.3		691.3		501.3		3,167.2	14,999	21.12%
SR1 ² 2008	27,417,874.10	169,853,162	16.14%	249.5		277.7		385.2		496.1		256.5		172.1		417.5		2,254.6	16,552	13.62%
SR1 ² 2007	45,148,685.94	151,797,598	29.74%					708.5		658.9		884.5		522.8		338.4		3,113.1	16,937	18.38%
CP1 2010	331,491,320.81	347,926,843	95.28%			3708.8	1748.7	1894.1		3349.8		3375.4		2959.9		2871.3		19,908.0	26,092	76.30%
CP1 2009	380,474,840.35	389,742,877	97.62%			3378.1	1458.8	1883.6		3894.5		4087.2		3998		3648.2		22,348.4	27,794	80.41%
CP1 2008	372,128,912.74	464,962,587	80.03%	1558.4		2426.5	1595.3	2820.7		3995.6		3950.5		4104.7		20,451.7		33,099	61,799%	61.79%
CP1 2007	235,996,565.64	342,968,349	68.81%					2875.1		2957.6		2920.2		2928.4		1644.9		13,326.2	33,538	39.73%
CP2 2010	479,474,830.03	522,574,435	91.75%			3658.9	1727.4	2078.9		4027.9		4155.7		4360.6		3800.7		23,810.1	32,381	73.53%
CP2 2009	424,455,616.16	475,208,074	89.32%			3731.7	1728.4	1926.8		3244.5		3907.6		3419.5		4275.8		22,234.3	31,542	70.49%
CP2 2008	376,170,635.86	511,104,326	73.60%	1504.4		2477.9	1483.3	2696.4		3371.8		3305.3		3206.3		18,045.4		34,900	51,71%	51.71%
CP2 2007	312,386,684.43	396,434,456	78.80%					3456.9		2469		2425.2		2794.7		2076.3		13,222.1	29,040	45.53%
CP3 2010	267,845,823.74	304,341,605	88.01%			2452.6	1148.2	1367		2747.2		2910.4		2993.7		2853.3		16,472.4	15,166	108.61%
CP3 2009	167,862,203.89	202,694,647	82.82%			1341.3	677	806.5		1521.4		1658.3		1865		2479.8		10,349.3	12,066	85.77%
CP3 2008	76,240,467.94	169,686,220	44.93%	175.7		113.6	123.7	530		973.4		1025.6		1298.9		4,240.9		13,984	30,33%	30.33%
CP3 2007	24,027,811.10	69,232,644	34.71%					295.6		76		313.3		227.3		416.3		1,328.5	20,532	6.47%
SR2 ² 2010	760,173.00	225,178,103	0.34%			235	15.5	99.2		127.6		401.9		232.6		272		1,383.8	35,399	3.91%
SR2 ² 2009	459,305.50	206,610,439	0.22%			171.6	75.5	54.5		141.2		226		193.5		230.9		1,093.2	36,461	3.00%
CP4 2010	658,672,640.78	809,577,000	81.36%			4085.8	2337.5	2502.2		4919.8		4602.1		4656.9		4261.9		27,366.2	47,001	58.22%
CP4 2009	524,575,976.57	671,467,000	78.12%			4222.9	2104.2	2536.2		4205		4035.4		3598.6		3635.7		24,338.0	58,278	41.76%
CP4 2008	557,356,891.60	780,221,000	71.44%	2379.7		4188.3	2025.6	3271.4		4543.7		3326.8		4189		23,924.5		57,102	41,90%	41.90%
CP4 2007	416,266,452.35	574,270,000	72.49%					3296.4		3502.1		3541.7		3765.4		2357.4		16,463.0	56,044	29.38%

¹ Incomplete data. Ceased operations.
² Short Range Segment Carrier

20/21 Apr 10	17.8	17+49	17+27	B747	CC4
20/21 Apr 10	15.2 ¹	15+12	14+46	B747	CC4
18/19 Apr 10	15.1 ¹	15+08	14+43	B747	CC4
5/6 Apr 10	16.7 ²	16+40	16+20	B747	CC4
6/7 Mar 10	16.3 ²	16+15	15+49	B747	CC4
25/26 Feb 10	16.2 ²	16+11	15+59	B747	CC4
23 Jan 10	15.2	15+10	14+49	B757	CP1
18/19 Jan 10	15.3	15+17	14+20	B747	CC4
14/15 Apr 09	15.1	15+03	14+35	B747	CC5
25 Mar 09	15.1	15+03	14+52	B747	NC3
15/16 Dec 08	15.3	15+16	15+02	B767	CP1
24/25 Nov 08	15.1	15+05	14+47	B767	CP1
6 Sep 08	16.1	16+05	15+40	B767	CP1
5 Sep 08	16.1	16+06	15+55	B747	NC5
3 Jun 08	15.3	15+15	14+52	B777	NC5
31 Jan/1 Feb 08	15.4 ³	15+21	15+10	B767	CP1
18/19 Jan 08	15.2 ³	15+09	14+58	B767	CP1
14 Jan 08	16.7	16+40	16+21	B747	CC4
17 Aug 07	15.5 ³	15+27	15+01	B767	CP1
20/21 Mar 07	16.7	16+40	16+19	B747	CC5
9/10 Feb 07	15.3 ³	15+19	14+49	B767	CP1

¹ These flights originated at KCHS and landed at the same OEF location.

² These flight originated at the same OEF location and landed at KCHS.

³ These flight originated at the same OIF location and landed at KJFK.

Quad Chart

CRAF & 60/40 Rule: Reinstatement using Block Hours

Major Todd E. McNeal
 Advisor: Dr. Pamela S. Donovan
 Department of Operational Sciences (ENS)
 Air Force Institute of Technology



General Framework

Civil Reserve Air Fleet

ID	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
101	15,200	15,200	15,200	15,200	15,200	15,200
102	15,200	15,200	15,200	15,200	15,200	15,200
103	15,200	15,200	15,200	15,200	15,200	15,200
104	15,200	15,200	15,200	15,200	15,200	15,200
105	15,200	15,200	15,200	15,200	15,200	15,200
106	15,200	15,200	15,200	15,200	15,200	15,200
107	15,200	15,200	15,200	15,200	15,200	15,200
108	15,200	15,200	15,200	15,200	15,200	15,200
109	15,200	15,200	15,200	15,200	15,200	15,200
110	15,200	15,200	15,200	15,200	15,200	15,200
111	15,200	15,200	15,200	15,200	15,200	15,200
112	15,200	15,200	15,200	15,200	15,200	15,200
113	15,200	15,200	15,200	15,200	15,200	15,200
114	15,200	15,200	15,200	15,200	15,200	15,200
115	15,200	15,200	15,200	15,200	15,200	15,200
116	15,200	15,200	15,200	15,200	15,200	15,200
117	15,200	15,200	15,200	15,200	15,200	15,200
118	15,200	15,200	15,200	15,200	15,200	15,200
119	15,200	15,200	15,200	15,200	15,200	15,200
120	15,200	15,200	15,200	15,200	15,200	15,200

Application

- DOD Block Hour 60/40 Rule = DOD Block Hrs (from GDSS2) / Total Block Hrs (from BTS)
- Identify surge capability and flexibility
- Charter carriers performing consistently and excessively above the CRAF commitment, in terms of Block Hours, reduce volunteerism, increasing likelihood of activation
- Identify potential impact due to a loss of one (or more) carriers in a segment

Motivation

- DOD's airlift mission depends upon healthy CRAF carriers
- Slow economic conditions plus high DOD use rate have made certain air carriers overly dependant upon DOD business
- Projections for FY11-15 show a dramatic reduction in DOD expenditures
- CRAF Air Carriers must begin balancing their economic position now in preparation

Recommendations

- DOD should implement a Block Hour 60/40 Rule, which should gradually be phased in from FY11-15.

Collaboration

HQ AMC Commercial Airlift Division
 HQ AMCA49
 US DOT & CRAF Carriers

Introduction

The Civil Reserve Air Fleet (CRAF) provides critical airlift capability to the Department of Defense (DOD) during both peace and wartime. One limitation placed upon CRAF carriers is the 60/40 Rule. This Rule states that commercial air carriers working on behalf of DOD can earn no more than 40% of their total revenue from DOD sources. Increased DOD airlift requirements from 2001 – 2010 led to suspension of the 60/40 Rule as DOD air transportation needs grew. As airlift demands are projected to subside from present day to 2015, certain air carriers, notably charter carriers, will need to find other sources of business to maintain economic viability. To encourage this adjustment, the DOD should return to enforcing the 60/40 Rule.

The 60/40 Rule is sporadically applied and cumbersome in part due to its reliance upon Revenue. Block Hours are the baseline of civil air operations, easily measurable, and maintain a common definition among air carriers. Therefore, an enforcement of a Block Hour 60/40 Rule is more balanced.

A Block Hour 60/40 Rule assumes that if a carrier is earning 60% or more of their block hours from non-DOD sources, economic balance can be implied. This is beneficial to the carriers as well because those severely in non-compliance with the Revenue 60/40 Rule, while possibly in non-compliance with a Block Hour 60/40 Rule, are less so, thereby allowing them more flexibility to rebalance their DOD to non-DOD economic balance.

Research Goals

- Identify if the 60/40 Rule is necessary
- If necessary, should the 60/40 Rule remain based on Revenue or change to a different measurement, such as Block Hours.
- Highlight possible advantages of using Block Hours to identify lost Surge CRAF Capability and the possible impact of a Lost CRAF Carrier upon the remaining carriers

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14. ABSTRACT The Civil Reserve Air Fleet (CRAF) provides critical airlift capability to the Department of Defense (DOD) during both peace and wartime. One limitation placed upon CRAF carriers is the 60/40 Rule. This Rule states that commercial air carriers working on behalf of DOD can earn no more than 40% of their total revenue from DOD sources. Increased DOD airlift requirements from 2001 – 2010 led to suspension of the 60/40 Rule as DOD air transportation needs grew. As airlift demands are projected to subside from present day to 2015, certain air carriers, notably charter carriers, will need to find other sources of business to maintain economic viability. To encourage this adjustment, the DOD should return to enforcing the 60/40 Rule. The 60/40 Rule is sporadically applied and cumbersome in part due to its reliance upon Revenue. Block Hours are the baseline of civil air operations, easily measureable, and maintain a common definition among air carriers. Therefore, an enforcement of a Block Hour 60/40 Rule is more balanced. A Block Hour 60/40 Rule assumes that if a carrier is earning 60% or more of their block hours from non-DOD sources, economic balance can be implied. This is beneficial to the carriers as well because those severely in non-compliance with the Revenue 60/40 Rule, while possibly in non-compliance with a Block Hour 60/40					
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