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SENATE ARMED SERVICES COMMITTEE

STATEMENT OF
CHRISTOPHER BOLKCOM
SPECIALIST IN NATIONAL DEFENSE
CONGRESSIONAL RESEARCH SERVICE

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SENATE ARMED SERVICES COMMITTEE
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HEARING ON
CURRENT AND FUTURE ROLES, MISSIONS AND CAPABILITIES OF U.S.
MILITARY AIR POWER

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Mr. Chairman, distinguished members of the subcommittee, thank you for inviting me to speak with you today about military aviation. As requested, I will address DoD's current and projected aviation capabilities and whether they will ensure that U.S. needs are met.

Introduction

As a rule, aviation forces are procured and operated as part of a strategy. Military aircraft are just some of the means, or resources which DoD employs to achieve its goals. When policy makers ask questions such as:

- “Should we buy more bombers?”
- “Is there a fighter gap?”
- “Is DoD aggressive enough in fielding UAVs?”
- “Do we have sufficient long-range cargo and aerial refueling capability?”

the answers should depend entirely on what specific needs military aviation is projected to meet.

Today, these needs are expressed in the 2006 Quadrennial Defense Review (QDR). Until the 2009 QDR is completed sometime this summer, the 2006 document (and associated strategy guidance) is the only framework for judging how well DoD's airpower capabilities meet national requirements. Yet it appears foolish to use the 2006 QDR as a rigid template, because the 2009 QDR could include new or different national objectives which would strongly influence military aviation. For example, one potential change in the 2009 QDR that could strongly affect judgments on airpower capabilities is the elimination of the long-standing requirement to successfully fight two simultaneous or nearly simultaneous major theater wars.¹ This requirement predates the QDR process, has been included in every QDR, and has a profound impact on military aviation force structure.²

It is difficult, and perhaps not particularly useful to try to predict all of the 2009 QDR's potential findings. One over-arching trend, however appears to run through a number of high-level DoD studies and planning documents, and appears highly useful to informing

¹ Thom Shanker. “Pentagon Rethinking Old Doctrine on 2 Wars.” *New York Times*. March 15, 2009.

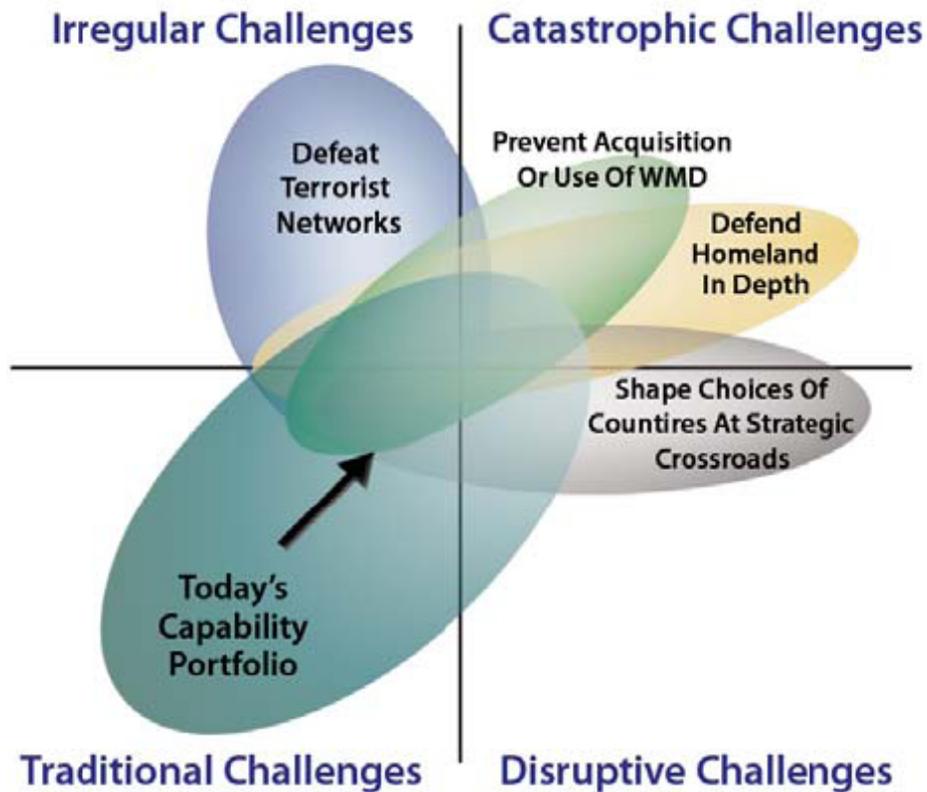
² In 1993, in the aftermath of the fall of the Soviet Union, Secretary of Defense Les Aspin conducted his “Bottom Up Review” of defense capabilities and found that although the threat from the Soviet Union had largely abated, the United States still faced noteworthy military challenges. Among other requirements, the Bottom Up Review concluded that DoD must be prepared to defend its Persian Gulf allies without diminishing its ability to also defend South Korea from a North Korean attack. When first recommended, the need to prepare for two simultaneous major theater wars was criticized by many as overly ambitious and unrealistic. (Andrew Krepinevich. “Assessing the Bottom-Up Review.” *Joint Forces Quarterly*. Winter 93-94.) Others believed the two-MTW objective was a rear-guard action to preserve military force structure at a time when much of the country wished to reduce military spending to achieve a “peace dividend.” (“Financial Realities Drive Aerospace Consolidation.” *Aviation Week & Space Technology*. May 1, 1995.)

assessments of DoD's airpower portfolio; namely, the need to rebalance military acquisition plans to field forces that are as capable against non-state actors, as they are against conventional foes.

In the spring of 2004, DOD's Strategic Planning Guidance found that the United States is well positioned to deal with a conventional military adversary. Increasingly, however, the United States may find itself facing non-conventional foes, for which it is not well prepared.³

The 2006 QDR picked up on this theme. As depicted in Figure 1, below, the 2006 QDR noted that "the Department is shifting its portfolio of capabilities to address irregular, catastrophic and disruptive challenges while sustaining capabilities to address traditional challenges."⁴

Fig. 1: DOD Capabilities



Source: 2006 QDR

³ "Building Top-Level Capabilities: A Framework for Strategic Thinking." Briefing to Senior Level Review Group. August 19, 2004.

⁴ 2006 QDR, p. 19.

In a press conference detailing DoD's key recommendations to the White House on the proposed FY10 defense budget, both Secretary of Defense Robert Gates and Vice Chairman of the Joint Chiefs of Staff Gen. James Cartwright emphasized the concept of "hybrid" warfare, a mixture of both high-end state-on-state conflict, and irregular warfare.⁵ DoD's leaders made it clear that they didn't think in terms of fighting either conventional *or* irregular warfare but in terms of addressing a spectrum of simultaneous conflict. Secretary Gates estimated (admittedly crudely) that up to 40% of DoD's budget would be spent on military forces that are equally pertinent to irregular and conventional warfare – "dual purpose" capabilities in his words. Secretary Gates' and Gen. Cartwright's comments appear to be completely consistent with the 2006 QDR's findings that DoD must be positioned to address an increasingly broad array of military challenges, many of them outside the realm of classic state-on-state conflict. It is within this context – the balancing of military aviation to effectively address "hybrid warfare" – that DoD airpower can be most effectively assessed.

The Challenges of Irregular, Non-State Actors⁶

Combating non-state actors presents a broad array of challenges to U.S. military forces. Planners tend to readily grasp the obvious operational challenges, but shouldn't overlook the need to re-vamp both tactics and doctrine, and while also being aware of the costs involved.

Operational Challenges. Military planners have a number of tools at their disposal to attempt to find, identify, track, capture, or kill terrorists, insurgents and other non-state actors. A survey of counterinsurgency and anti-terrorism efforts indicates that in general, military aviation plays a prominent role in performing these tasks. Airpower has proven very valuable in contemporary (e.g., Iraq, Afghanistan, Philippines) and historical (e.g., El Salvador) counterinsurgencies. The most critical missions appear to be persistent surveillance and reconnaissance, aerial insertion of troops, close air support, combat search and rescue, medical evacuation, and tactical airlift and resupply.⁷

Achieving air superiority and attacking military targets on the ground – missions at which today's aviation forces excel -- are also important to counterinsurgency and other non-state actor operations. These missions don't however, typically require the high performance characteristics of the combat aircraft that DoD is currently procuring and developing. Non-state actors do not have the resources to effectively challenge even modest air forces. Thus, aircraft best suited to addressing irregular warfare may emphasize long endurance, slower speeds, and may often, if not typically, be unmanned.

⁵ "DoD News Briefing With Secretary Gates From The Pentagon." *News Transcript*. Office of the Assistant Secretary of Defense (Public Affairs). April 6, 2009.

⁶ "Non-state actors" is an umbrella term that refers to a number of armed groups such as political terrorists, narco-traffickers, paramilitary insurgents, and even international organized criminal organizations. These terms are not mutually exclusive. Paramilitary groups can, for example, engage in narco-trafficking, terrorism, and crime. For example: "International terrorism is known to be linked closely with the drug trade and criminal organizations..." (Lt. Gen. Gennadiy M. Yevstafyev. "Unmanned Aerial Vehicles in Classic and Terrorist Wars." *Moscow Yadernyy Kontrol*. July 5, 2004. pp. 77-82.)

⁷ A more complete treatment of this topic can be found in CRS Report RL32737.

Compared to the armed forces of a nation state, non-state actors are relatively easy to defeat in direct combat. Non-state actors typically lack the equipment, training and discipline that define a state-based military force. Actually engaging in direct combat with non-state actors is, however, the core operational challenge. Non-state actors typically don't wear uniforms. Indeed, they generally strive to integrate themselves into the local civilian population. Thus, target identification is very challenging. Non-state actors rarely mass into easily recognizable formations. They typically lack large infrastructure or obvious logistics processes. Therefore, non-state actors present few "high value" targets for U.S. forces. This challenge has not been lost on DoD leadership. For example a former Commander of Air Force Special Operations notes:

For many years, though, there's been a concern that intelligence collection capability basically rested in the ability to find a tank or an artillery piece hiding in a grove of trees. The problem now becomes how to find individuals hiding in groups of people...This presents a huge problem for us.⁸

The leadership and structure of many non-state organizations are opaque. Such organizations might be diffuse and operate over long distances. Al Qaeda, for example, often operates through partner organizations which might be small and have fluid leadership. One DoD leader has said "When we kill or capture one of these leaders, another one steps in and quickly takes their place."⁹

Once identified, non-state actors are often difficult to engage due to concerns over collateral damage. Even conventional state-on-state conflict presents collateral damage concerns. When one party is actively trying to shield itself behind non-combatants, however, delivering weapons with extreme precision and minimum effects takes on increased importance. A RAND study summed up the operational challenges:

...ferreting out individuals or small groups of terrorists, positively identifying them, and engaging them without harming nearby civilians is an extremely demanding task. Substantial improvements will be needed in several areas before the Air Force can be confident of being able to provide this capability to combatant commanders.¹⁰

Mindset Challenges. Successfully combating non-state actors and irregular warfare will likely require different training, tactics, doctrine, political strategies, and potentially rules of engagement, than are optimal for conventional military warfare. Collectively, these changes may combine to require a different politico-military mindset for senior decision makers.

⁸ Lt.Gen. Michael W. Wooley. Commander, Air Force Special Operations Command. "Application of Special Operations Forces in the Global War on Terror." Air & Space Conference 2004. Washington, DC. September 14, 2004.

⁹ *Ibid*

¹⁰ David Ochmanek. "Military Operations Against Terrorist Groups Abroad." RAND. 2003.

The U.S. military, policy makers and the general population, desire short conflicts, with clear success criteria, exit strategies, and decisive victories. In a conventional setting, “victory” typically entails an adversary’s unconditional surrender. But non-state actors may define victory as not losing; their continued existence is a victory. This mindset characterizes several Palestinian terrorist groups that fought Israel’s occupation of Palestinian territories. In most cases, they themselves cannot achieve rapid, decisive victory, so they follow a strategy of protracted war. According to one scholar “...insurgent, terrorist and criminal organizations consciously design themselves so that our military and police forces cannot rapidly and decisively defeat them.”¹¹ Others note that “even dying for their cause intentionally or voluntarily is perceived as a victory (for terrorists). It’s a different paradigm than the traditional military concern for limiting casualties.”¹² This is characteristic of groups such as Hamas and Al Qaeda that employ suicide tactics.

In a conventional warfare setting, state-based armed forces guided by the laws of war typically attempt to avoid civilians or shield them from the war’s consequences. When combating non-state actors, however, civilians may need to be engaged at an unprecedented level. Winning the “hearts and minds” of the local population, or at least not alienating them could become a large part of the overall counter insurgent, or counter terrorist strategy.

Terrorists and insurgents require at least tacit, if not active, support from the local population to operate effectively. In the words of one British general responsible for counter-insurgency operations “The shooting side of the business is only 25 percent of the trouble. The other 75 percent is getting the people of this country behind us.”¹³ However, the military activities at which today’s armed forces excel, such as precisely destroying buildings or vehicles, may work counter to this “hearts and minds” strategy. According to one study “counter terrorist military attacks against elusive terrorists may serve only to radicalize large sectors of the (Muslim) population and damage the U.S. image worldwide.”¹⁴

Cost Challenges. Almost by definition, non-state actors employ weapons and methods that are inexpensive, when compared to training, equipping and employing a military force. However, the cost to defend against non-state actors, or to combat them, can be high. For example, terrorists can acquire man-portable, air defense systems (MANPADS) for as little as \$5,000. If a terrorist succeeded in shooting down a commercial airliner with this shoulder-fired missile, the immediate cost of losing the airplane would be over \$100 million, and the indirect costs much higher. Further, fielding technologies on commercial aircraft to defend against this threat could cost the United States \$10 billion

¹¹ Thomas R. Searle. “Making Airpower Effective against Guerrillas.” *Air & Space Power Journal*. Fall 2004.

¹² Wooley. *Op. cit.*

¹³ Lt. Gen. Sir Gerald Templer, the British High Commissioner to Malaya. As cited in David Ochmanek. “Military Operations Against Terrorist Groups Abroad.” RAND. Santa Monica, CA. 2003.

¹⁴ The Sociology and Psychology of Terrorism: Who Becomes a Terrorist and Why? A Report Prepared under an Interagency Agreement by the Federal Research Division, Library of Congress. September 1999. P.68.

in acquisition costs alone.¹⁵ The “cost-exchange ratio” of fighting non-state actors is not in the United States’ favor.

A Balancing Act

There is a strong consensus in defense circles that airpower is one of the United States’ great military advantages. As mentioned earlier in this testimony, however, many observers are increasingly concerned that military aviation is focused too much on the demands of fighting conventional foes to the detriment of irregular warfare, and that “the challenge for the Air Force is to re-shape its forces to increase their relevance in small wars, while maintaining the capability to win major conflicts.”¹⁶ In other words, in this view, a balance must be struck.

Arguments for maintaining the current focus. Supporters of DoD’s current modernization plans – which largely reflect forces required for state-on-state conflict -- say that the F-22, JSF, F/A-18E/F and other “high-end” platforms are still required for state-on-state conflict, despite U.S. preeminence in this area, and that new concepts of operation, new organizational schema, or technology upgrades may increase these systems’ applicability to counterinsurgency and irregular warfare challenges. Those who support DoD’s current aviation modernization plans could argue that fluid threat environments are nothing new. Platforms with long development time lines and long operational lives often must be modified and used differently than originally intentioned so as to keep pace with new threats and military objectives. It is much more difficult, to take the opposite approach, they could argue. From their perspective, DoD can’t develop technologically less sophisticated weapons systems to address unconventional threats, and then improve these systems in the future if more high tech threats arise.

While “low-tech” insurgents and other non-state actors appear to deserve more attention than in the past, the United States shouldn’t slight its traditional military strengths, “conventional” aviation supporters argue. DoD has evolved from a “threat based” to a “capabilities based” planning framework. Threats can change, but the military capabilities the Nation desires, tend to have a longer life-span. The ability to achieve air dominance is a key military capability the U.S. must maintain, supporters of DoD’s current aviation plans say, and the U.S. must be capable of conducting this mission in the most stressing scenarios; such as a potential conflict with China, for example. By preparing for the most stressing case, in this view, the U.S. can more than satisfy lesser included cases, such as air dominance missions against non-state actors.

Russian SA-10, SA-12, and SA-20 SAMs (also called “double digit” SAMs) are a concern for military planners due to their mobility, long range, high altitude, advanced missile guidance, and sensitive radars. The Russian SA-20 has been likened to the U.S. Patriot PAC-2 missile, but with an even longer range, and a radar that is very effective in

¹⁵ A more complete treatment of this topic can be found in CRS Report RL31741.

¹⁶ Thomas McCarthy. National Security for the 21st Century: The Air Force and Foreign Internal Defense. School of Advanced Air and Space Studies. Air University. Maxwell AFB, AL. June 2004. p.67. And Thomas R. Searle. “Making Airpower Effective against Guerrillas.” Air & Space Power Journal. Fall 2004.

detecting stealthy aircraft. Military planners are concerned that a country with only a handful of these SAMs could effectively challenge U.S. military air operations by threatening aircraft and disrupting operations from great distances. The transfer of such weapons to countries such as Iran, are particularly worrisome.¹⁷

A variety of new technologies and military systems could exacerbate the “double-digit” SAM challenge. First, commercial information and communications technologies are enabling adversaries to better network the elements of their air defense systems. This allows them to disperse radars, SAM launchers and other associated platforms throughout the battlespace, and to share targeting information among launchers. This, in turn, suggests that radars may be used less frequently and for shorter periods of time, complicating efforts to avoid or suppress them. Second, terminal defenses are being marketed by a number of international defense companies. These radar-guided Gatling guns are designed to protect “double-digit” SAMs or other high value air defense assets. These systems could prove quite effective in shooting down missiles aimed at enemy air defenses. Third, Russia and other countries have developed and are selling GPS jammers. Over varying distances, these low-watt jammers may degrade the GPS guidance signals used by many U.S. precision guided munitions (PGMs) to augment inertial guidance systems, reducing their accuracy.

If these double-digit SAMs are protected by an enemy air force equipped with advanced Russian or European combat aircraft, the military problem becomes dire, say supporters of DoD tactical aviation. According to press reports, a joint US- Indian Air Force exercise, called *Cope India*, illustrates that pilots from non-NATO countries can receive excellent training and execute advanced air combat tactics. When flying advanced combat aircraft such as the Russian-designed SU-30, such well trained pilots could effectively challenge U.S. air forces, some say.

Arguments for Re-balancing. Most would agree that DoD still requires advanced aircraft to deter and fight tomorrow’s potential conventional conflicts. However, many argue that the efforts and resources expended to develop and produce these aircraft are not balanced with current and foreseeable conventional military challenges. The ability to achieve air dominance is a key capability that DoD must sustain, but against whom? Air dominance was achieved in about 15 minutes over Afghanistan and Iraq, some say, and, for the most part, with aircraft designed 30 years ago (e.g., F-15s, F-16s, F/A-18s).

The stressing air dominance scenario described above may require some of the aircraft currently being developed by DoD. However, how many of these scenarios might realistically emerge in the future? Many would agree that a potential conflict with China could be one such challenge, but other credible examples are very difficult to imagine. Those who seek a re-balancing of military aviation argue that the proliferation of advanced SAMs has not occurred, and will likely not occur in the future, at the rate predicted by DoD.

¹⁷ David A. Fulghum. “Russia Sells SA-20 to Iran.” *Aviation Week & Space Technology*. December 15, 2008.

Despite being on the market for over 25 years, Russia reportedly has only managed to transfer double-digit SAMs to six countries (Bulgaria, China, Czech Republic, Germany, Greece and Kazakhstan), three of which were Soviet client states at the time of the sale. Further, re-balancing advocates would argue, Russia has been threatening to sell double-digit SAMs to Iran since the early 1990s, in part, to increase its leverage *vis-a-vis* the United States in the region. No deliveries have yet been reported in the open press, and in April 2009, senior Russian defense officials stated that Russia has not delivered SA-20s to Tehran.¹⁸

While these weapons are clearly dangerous, they are also expensive, and require extensive training to operate effectively. This has arguably slowed the proliferation of these systems, and may also do so in the future. Russia reportedly attempted but failed to sell SA-10 and SA-12 SAMs to Chile, Egypt, Hungary, Iran, Kuwait, Serbia, South Korea, Syria, and Turkey. These countries have opted instead to purchase either U.S. SAMs, or more modest air defense systems. According to one well-known missile analyst

Russia has traditionally played a significant role in world-wide SAM export. But Russian SAM sales have taken a nose dive since their heyday in the 1970s and 1980s. Particularly disappointing has been the very small scale of sales of the expensive high altitude systems like the S-300P and S-300V. The Russian industries had expected to sell 11 S-300P batteries in 1996-97, when in fact only about three were sold. Aside from these very modest sales to China and Greece, few other sales have materialized. Combined with the almost complete collapse of Russian defense procurement, the firms developing these systems have been on the brink of bankruptcy in recent years.¹⁹

Those who wish to re-balance military aviation also argue that the proliferation of, and threat from advanced combat aircraft is also overstated. Building, operating, and maintaining a modern air force is much more expensive and resource intensive than fielding advanced SAMs. Few countries have the resources and national will to develop and maintain an air force that could challenge U.S. airpower, they argue. Some say that advanced Russian and European aircraft being developed and fielded today may compare well to 30-year old U.S. combat aircraft, on a one-to-one basis. But aircraft don't fight on a one-to-one basis. Instead, they are part of a much larger airpower system. This system is composed, for example, of combat, intelligence, surveillance, airborne warning and control, aerial refueling, electronic warfare, and mission control assets. The importance of well trained pilots and maintenance personnel, which take considerable time and resources to create, cannot be over emphasized.

No other country has an airpower system on par with the United States, nor is one predicted to emerge.²⁰ Therefore, some argue, today's DoD's tactical aviation programs

¹⁸ "No S-300 Delivery To Iran" *Moscow Times* (as reported by the Associated Press). April 16, 2009.

¹⁹ Steven Zaloga. *World Missile Briefing*. Teal Group. Inc. Fairfax, VA. February 2008.

²⁰ In an April 7, 2009 press conference, Secretary Gates estimated that "the intelligence that I've gotten indicates that the first IOC for anything like a fifth-generation fighter in Russia would be about 2016, and in China would be about 2020." CRS has conducted numerous studies on the implications of advanced

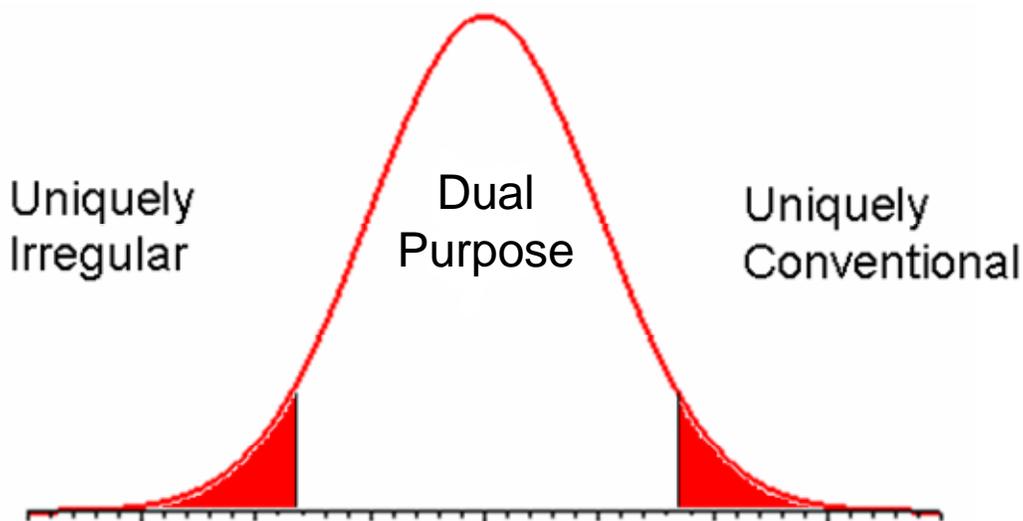
can be safely reduced in order to free up funds to address other military challenges, and thus bring scarce resources more into balance. The resources saved from these cuts to DoD's most advanced aviation programs could be used to invest in capabilities more applicable to combating terrorists and insurgents, or to conduct homeland defense.

Conclusion: What might a re-balanced force look like?

Given the challenges of combating non-state actors, and if it were agreed that aviation forces should be re-balanced toward irregular warfare, what capabilities might such a force possess? As a rough blueprint, Secretary Gates suggested that 10 percent of defense spending would focus on military forces devoted exclusively to irregular warfare, 50 percent of the budget on forces focused on conventional warfare, and 40 percent on “dual capable” forces.

In the case of aviation forces, the ratio of capabilities in each warfare domain might be different than Gates' suggested 10-50-40 construct. Owing to their inherent flexibility, and the growing relative importance of sensors, communications and targeting technology vis-à-vis aeronautical performance, military aircraft can be effectively used in a number of different roles. Only the most specialized aviation assets are likely to be unique to a warfighting domain, and therefore, a more balanced spending on aviation forces may look more like the classic bell curve depicted in Figure 2 below, with aviation forces spending apportioned in a 10-80-10 percent ratio.

Fig. 2: Illustrative Spending To Re-balance DoD Aviation



Russian and Chinese fighter aircraft for U.S. forces. See, for example, CRS Report RL30700 for a more comprehensive treatment of this topic.

Uniquely irregular. A brief review of the use of military aviation against non-state actors suggests that there are few platforms, weapons, or processes unique to irregular warfare. Very small munitions that minimize the chance of collateral damage would arguably be more pertinent to irregular than conventional warfare. Another example would be an off-the-shelf, lightly armed turbo-prop aircraft for attacking non-state actors. Such an aircraft is now being studied by the Air Force's Air Combat Command.²¹ Reducing the number of advanced combat aircraft in the Service's inventories and replacing them with some number of these much less expensive aircraft or with armed UAVs could garner considerable life cycle cost savings.

Perhaps the aviation capability most obviously peculiar to irregular warfare is an advisory one: the mission of training and counseling allied and partner nations in the employment of *their* airpower against insurgents and non-state actors. This mission, called Aviation-Foreign Internal Defense (A-FID) is performed by a single squadron in the Air Force Special Operations Command (the 6th Special Operations Squadron). According to one expert, "One of the most important roles that U.S. forces can play in the fight against terrorist groups is to train, advise, and assist the forces of other nations in counterinsurgency and counterterrorist operations."²² Yet, the 6th Special Operations Squadron is composed of approximately 125 personnel and operates on an annual budget ranging between \$2 million and \$5 million. Re-balancing DoD aviation capabilities toward a more robust counter insurgency role may entail expanding and strengthening DoD's A-FID capabilities.

Uniquely conventional. There also appear to be few aviation resources unique to conventional, state-on-state conflict. Delivering nuclear weapons, penetrating and defeating advanced air defenses, and defeating modern air forces are missions clearly germane to state-on-state conflict. It would appear feasible to reduce the aviation forces unique to these missions if they were found to be in excess of force levels dictated by the QDR and other strategy guidance, and invest the savings in dual purpose assets or assets optimized for irregular warfare.

Dual Purpose. Most aviation missions that apply to irregular warfare also apply to state-on-state warfare: close air support, precision strike, ISR, medical evacuation, stealthy insertion of troops, just to mention a few. For some missions, the requirements for irregular warfare are more taxing than the requirements for state-on-state conflict, and these requirements will set the standard for aviation capabilities. In other instances, the mission requirements for conventional warfare will be the most taxing. A review of recent experience in Iraq and Afghanistan indicates that commanders in the field have been successfully adapting and employing weapon systems designed for state-on-state conflict in their fight against insurgents and other non-state actors. For example, large, "strategic" bombers have conducted close air support missions. Electronic warfare

²¹ Marcus Weisgerber. "Air Force Funds Study to Determine Light-Attack Plane Requirement." *Inside the Air Force*. April 3, 2009.

²² Ochmanek. *Op Cit*.

aircraft such as the EA-6B Prowler and the EC-130 Compass Call have been used to detect and jam IEDs. Air superiority fighters, having no enemy to fight, have been used as “mini-AWACs”, providing real-time coordination and assembly of strike packages to attack time-sensitive targets.²³

In conclusion, it appears that an opportunity exists today, through the upcoming QDR and concomitant congressional oversight, to ground battlefield innovation, such as described above, in strategy. This process is designed to match airpower capabilities to meet national goals in the projected threat environment, and field an aviation force structure that is both effective and *cost*-effective.

Mr. Chairman, that concludes my remarks. It’s been my pleasure to address you today. I look forward to any questions you may have.

²³ CRS interviews with Air Force pilots deployed to Iraq. March 2009.