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14. ABSTRACT

Today, aerial refueling is essential to quickly open or prepare air bases of operations and generate missions. It is also necessary to quickly deploy, efficiently sustain and maintain, and quickly redeploy forces. In short, without a robust, multi-service, aerial refueling capability, the combatant commanders (CC) will not be able to efficiently project power throughout their areas of responsibility (AOR). Therefore, the CCs should place aerial refueling capability and the recapitalization of the multiple tanker fleets at the top of their integrated priority lists and should also take sufficient personal interest in "shaping" their AORs to ensure that aerial refueling infrastructure requirements are developed and negotiated prior to the outbreak of hostilities. CCs should also push the services to develop and adopt technologies that increase the flexibility of the tanker fleet including multipoint refueling, defensive systems, and austere field capability.

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Global Vigilance, Reach, and Power?
Made Possible only with a Robust Tanker Capability

By

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A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my personal views and are not necessarily endorsed by the Naval War College, the Department of the Navy, or the U.S. Air Force.

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Abstract

Today, aerial refueling is essential to quickly open or prepare air bases of operations and generate missions. It is also necessary to quickly deploy, efficiently sustain and maintain, and quickly redeploy forces. In short, without a robust, multi-service, aerial refueling capability, the combatant commanders (CC) will not be able to efficiently project power throughout their areas of responsibility (AOR). Therefore, the CCs should place aerial refueling capability and the recapitalization of the multiple tanker fleets at the top of their integrated priority lists and should also take sufficient personal interest in "shaping" their AORs to ensure that aerial refueling infrastructure requirements are developed and negotiated prior to the outbreak of hostilities. CCs should also push the services to develop and adopt technologies that increase the flexibility of the tanker fleet including multipoint refueling, defensive systems, and austere field capability.

In my mind, the biggest challenge our Air Force faces is the recapitalization challenge and clearly, at the top of that list, is the tanker issue.

Honorable Peter Teets[1]

This incredible statement by the former Secretary of the Air Force illustrates the recent realization by the service of the critical importance of the aerial refueling fleet on modern joint operations and the potential impact that a dislocation of the fleet could have on the U.S. military's ability to project power. The statement is made all the more incredible by the fact that Secretary Teets went on to list the premier U.S. Air Force (USAF) air dominance fighter, the Lockheed Martin F/A-22 Raptor, as the second item on his list. Given the service's predilection towards the criticality of the single-seat, manned air-to-air fighter since the early 1980s and the recent decision by the Secretary of Defense to reduce the F/A-22 procurement from 339 units to 179 units, the statement by Secretary Teets truly represents a paradigm shift by the Air Force regarding the critical role played by the tanker fleet in the future joint battlespace.

For most observers, the U.S. military is at an important crossroads. All of the services face daunting recapitalization challenges and an unpredictable world. However, some dynamics have not changed. The United States would prefer to face military threats in forward locations instead of U.S. territory and must be prepared to fight our future wars across the full spectrum of conflict. Therefore, regardless of the future threat, whether terrorists in Africa, a resurgent China, or resource-related wars between central Asian states, the United States will need to project power at long distances from the homeland. In fact, for any future major or minor operation, whether delivering humanitarian relief or Joint Direct Attack Munitions, U.S. military airpower assets will require aerial refueling to achieve their objectives. Today, aerial refueling is essential to quickly open or prepare air bases of

operations and generate missions. It is also necessary to quickly deploy, efficiently sustain and maintain, and quickly redeploy forces. In short, without a robust, multi-service, aerial refueling capability, the combatant commanders (CC) will not be able to efficiently project power throughout their areas of responsibility (AOR). Therefore, the CCs should place aerial refueling capability and the recapitalization of the multiple tanker fleets at the top of their integrated priority lists and should also take sufficient personal interest in "shaping" their AORs to ensure that aerial refueling infrastructure requirements are developed and negotiated prior to the outbreak of hostilities. CCs should also push the services to develop and adopt technologies that increase the flexibility of the tanker fleet including multipoint refueling, defensive systems, and austere field capability.

Some might question if a paradigm shift on the part of the combatant commander is really necessary. Do the increased risks they face if tankers and infrastructure are not made a priority warrant their concern? This paper will use the Falklands/Malvinas conflict to illustrate a case where limited aerial refueling capability and insufficient tanker infrastructure may have had an impact on the outcome of the conflict and certainly multiplied the level of risk for the military commanders. It will also discuss emerging aerial refueling trends from the last three major U.S. joint operations/campaigns: Allied Force, Enduring Freedom, and Iraqi Freedom. These trends indicate that the U.S. aerial refueling capability may become a decisive point for our adversaries and that immediate steps should be taken to ensure this critical capability will be robust enough to efficiently support future joint operations. Finally, this paper will examine the likely future battlespace, methods to increase the flexibility of the tanker fleet, operational risks, and counterarguments, to assess the

implications of not maintaining a robust aerial refueling capability on the CC's ability to project power in future joint operations.

The Falklands/Malvinas Conflict

The Argentine military only had two KC-130 refueling aircraft for both their Air Force and Navy air arms.[2] Due to their lack of refueling capability, Argentine airpower could not properly mass their forces for greatest effect, nor did they have sufficient loiter time to properly synchronize their attacks. For instance, since the Argentine tanker fleet could only support the launch of four strike aircraft at a time[3] and since many of their aircraft were not aerial refueling capable, on the first day of major aerial combat, the Argentine military launched a total of seventy-two aircraft in twelve separate waves.[4] In addition, even with aerial refueling (Skyhawks) and drop tanks (Mirage and Daggers), the attacking aircraft only had a few minutes of loiter time over the target area to find and engage their targets.[5] Due in part to their lack of loiter time, "approximately one third of all Argentine aircraft sent to strike the British returned home without making contact."[6] If the Argentine air forces had been able to mass their forces for a concentrated and synchronized attack, they probably would have saturated the British air defense capabilities and had a better chance of sinking or severely disabling more British capital ships (especially if they had been able to get their gravity bombs to fuse on contact). Significant additional losses of capital ships might have spelled disaster for British hopes of reclaiming the islands.

The lack of refueling capability also had a negative impact on the survival rate of the Argentine aircraft. For example, the Argentine military was not able to use their fighter aircraft (Mirage IIIs) to escort their fighter-bombers (Skyhawks and Mirage Vs). In fact, their Mirage fleet did not have aerial refueling capability and so did not have sufficient fuel

to effectively engage the British Harriers in dogfights (their lack of fuel also prevented them from using their enormous speed advantage over the subsonic Harriers).[7] If the Mirages attempted to use their afterburner, they would run out of fuel before reaching their home bases in Argentina.[8] Since the vast majority of British kills were recorded by the Harriers, the diversion of these fleet defenders by Argentine fighter escorts might have had a decisive impact on Argentine efforts to sink British capital ships and attack the British lodgment at San Carlos. Likewise, the shortage of aerial refueling assets also meant that the attacking fighter-bombers did not have sufficient fuel to properly evade the British Harriers.

Unlike the Argentines, the British maintained a somewhat larger aerial refueling fleet. Unfortunately, basing restrictions limited their usefulness. The nearest base was on Ascension Island approximately 3300 nautical miles from the Falklands. The British did not have access to bases on the South American continent and did not attempt to secure basing rights with Argentina's neighbors. Nonetheless, the British did use their tanker fleet in an effort to shutdown the airfield near Port Stanley. They wanted to eliminate the threat from Argentine attack aircraft stationed there and also cut the air line of communication (LOC) between the Argentine mainland and the Falklands. The British tanker fleet was composed of Victor aircraft. Since the Victors were not wide-body aircraft and had only a limited fuel off-load capacity, for one bombing run by a single British Vulcan bomber, eleven tankers (including two spares) were required.[9] Unfortunately, without precision guided munitions, the bomber attacks neither halted Argentine operations from the Port Stanley airfield nor prevented the aerial resupply of military forces on the island.

The British also considered carrying out strikes against Argentine airfields on the mainland using their Vulcan bombers. However, constrained by limited ramp space at

Ascension, limited numbers of Victor tankers and crews, and no forward operating bases in South America, strikes by the Vulcans could not be justified as cost effective or worth the enormous effort.[10] Therefore, the lack of tanker basing and the limitations of their tanker fleet probably contributed to the British decision to restrict their freedom of action against the Argentine military.

Operation Allied Force (OAF)

Tankers played a critical role in the successful accomplishment of OAF objectives. Some of the emerging trends demonstrated by the operation were the difficulties associated with force bed-down and the need to place the tanker tracks close to the battlespace. According to Lieutenant General Begert, the vice commander of U.S. Air Forces in Europe during OAF, at least 90% of the North Atlantic Treaty Organization (NATO) tanker force was supplied by the United States.[11] These tankers were deployed at a variety of military and commercial airfields. The USAF force of "112 active and 63 reserve-component tankers flew over 5000 sorties to enable 24,000 combat and combat support sorties" to be flown during the operation.[12] The large number of tankers required to sustain the level of combat operations led to significant challenges in regard to bases of operations (BOO) and lines of operations (LOO). As the tanker force grew from 55 to 175, they quickly overwhelmed the normal theater bases for tanker operations. The operation planners were forced to conduct site surveys of additional bases and were forced to bed-down the force at twelve widely dispersed locations throughout Europe.[13] Due to tanker operational requirements including runway length, load-bearing capacity, ramp space, etc., many former NATO and Warsaw Pact bases were not suitable. The resulting long LOOs for these tankers meant each asset could off-load less fuel. In addition, some of the airfields selected for operations had less

than optimal runway lengths which also led to reduced off-load capabilities. These compromises and the increased flight times for strike packages due to airspace and over flight restrictions imposed by some nations increased requirements for the tanker fleet.[14]

The geography of Serbia and the airspace restrictions imposed on the Allied forces resulted in a dearth of options for tanker track locations. The fixed position of the tanker tracks and their relative proximity to the combat zone meant that the tankers faced increased threats. In fact, a KC-135 "was within 70 miles of two MiG-29s when two F-15Cs shot down the Yugoslav fighters over Bosnian airspace."[15] Luckily, innovative and dedicated airmen were able to adapt and overcome all of these thorny issues. In fact, the tanker force was actually aided by the weather and the politically sensitive nature of the Allied Force mission. Although the air effort lasted a total of 78 days, only 21 days had favorable weather. Since the nature of the mission prevented the widespread use of weapons without visual identification of the target, "nearly 20 percent of all strike missions, along with their supporting tankers, were cancelled due to poor weather."[16] These factors helped mitigate the impact of the dispersed BOOs and long LOOs on tanker operations.

Operation Enduring Freedom (OEF)

Geography played a key role in OEF and in the role that the U.S tanker forces would play. Since Afghanistan was a poor, land-locked nation that had been racked by decades of war, neither it nor many of its neighbors possessed the proper infrastructure to sustain and maintain a large fleet of big-wing tankers. Therefore, some of the first U.S. military personnel to be deployed were airlift and tanker planners.[17] In addition, the dearth of built-up BOOs also meant that the majority of air strikes were carried out by carrier-based air and long-range bombers. Since the carrier aircraft in the Arabian Sea had to fly, on average, 750

miles to reach their targets in Afghanistan and bombers based at Diego Garcia had to fly 2,500 miles to reach their targets, tankers played a critical role in the success of the operation.[18] In fact, although early in the operation the United States only delivered approximately 100 strike sorties per day, the effort required approximately 70 percent of the USAF's active duty tanker fleet.[19] Furthermore, attack sorties from the Persian Gulf area and global strike bomber missions flown from the continental United States were also heavily dependent on tanker support. For example, six B-2 Spirit bombers originating from Whiteman AFB in Missouri struck targets in Afghanistan and then recovered to Diego Garcia. "A fleet of 21 tankers ensured that each B-2 received the required six air refuelings" to successfully accomplish the 40+ hour mission.[20] Likewise, United Kingdom Royal Air Force (RAF) tankers also played a critical role in ensuring that carrier-based airpower could be brought to bear against the Taliban and Al Qaeda. In fact, approximately one-fifth of U.S. aircraft in ground attacks were refueled by the RAF.[21] Thus, the joint tanker fleet played a pivotal role in allowing the successful prosecution of the air war over the skies of Afghanistan.

One emerging trend from the operation that will likely increase the need for tankers in future joint operations is the ability of modern airpower to loiter over a target area in a permissive environment and provide close air support (CAS) when requested by ground forces. Since Afghanistan's pre-planned targets were eliminated relatively quickly, "within a week of the start of the operation, Navy aircraft would launch from their carriers without knowing their targets."[22] Organic and Air Force tankers provided the fuel necessary for these fighter aircraft to loiter long over the target area and await targeting instructions from U.S. Special Forces personnel. Likewise, for the first time, U.S. heavy bombers, B-52s and B-

1Bs, were also called upon to deliver CAS using precision-guided munitions.[23] Although the bombers operating from Diego Garcia had the unrefueled range to accomplish routine bombing missions, the desire for the bombers to loiter and await instructions from U.S. Special Forces personnel on the ground (commanders also preferred that they went into Afghanistan with a fuel cushion in case of hostile fire or an accident), meant that they were usually refueled in Pakistan before entering Afghanistan.[24] The heavy use of fighters and bombers as on-call CAS assets combined with the long LOOs in the Afghanistan area of operations meant that the tanker fleet was a pivotal force multiplier and a key to successful joint operations.

On a more somber note, OEF demonstrated how stressed the joint tanker fleet was supporting one operation far from well-established bases and over large geographic areas. If the U.S. military needed to simultaneously support a second major operation, the shortfalls in the tanker fleet could have been acute. For instance, the commander of U.S. Transportation Command, General Charles T. Robertson, stated that "if there was another war, there might have come a point where I call the CINC and the Chairman and say, 'I'm maxed out—what's your priority?'"[25]

Operation Iraqi Freedom (OIF)

OIF was another showcase for the importance of the tanker fleet for joint operations and achievement of the combatant commander's objectives. Like OAF and OEF, bed-down of the force continued to be a challenge. As opposed to Desert Shield/Desert Storm where nearly 350 tankers were bed-down at five bases, for OIF, 210 tankers (including RAF, Royal Australian Air Force, and Marine tankers[26]) were bed-down at fifteen bases throughout the region.[27] One of the reasons for the dispersed bed-down of the fleet was that tanker basing

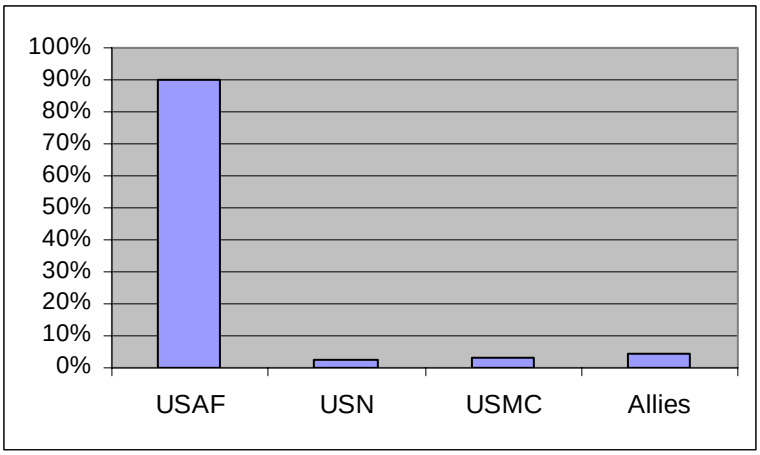
was denied by Turkey, Saudi Arabia, and Egypt.[28] In some cases, the availability of bases and long LOCs for the tankers meant that some assets were not available to support the generation of combat sorties. For instance, without access to tanker bases in Turkey, there was a shortfall of big-wing tankers for Navy air missions from the *USS Harry S Truman* and *USS Theodore Roosevelt* in the Mediterranean.[29] Several strike aircraft were forced to drop their munitions into the sea and return to their carriers due to the shortage of tankers in their area. The tanker shortage was not confined to the carriers operating from the Mediterranean. In fact, the shortage was felt by both the Air Force and the Navy. For example, one exasperated A-10 Operations Group Commanders stated, "…we were told we'd have gas for 48 sorties today and we had none – you're holding down one of the best CAS assets you have."[30] Luckily, Navy organic tankers helped to compensate for stress on big-wing tanker assets. For carriers in the North Arabian Gulf, they provided capability for 72 CAS sorties, and for carriers in the Mediterranean, they helped minimize diverts and increased loiter time for Navy strike assets.[31] In addition, the big-wing tanker shortage forced the Navy to improvise and adapt to help get more of their strike assets to the fight. For instance, "Carrier Wing 11, of the *USS Nimitz,* "lent" four F/A-18 E/F Super Hornets to Carrier Wing 14, aboard *USS Abraham Lincoln,* to fly in the buddy tanking role."[32] The Super Hornets from *USS Abraham Lincoln* were able to generate 434 strike sorties using organic tanking by using Super Hornets inbound to the target and S-3Bs Vikings returning to the carrier.[33]

Whereas OEF stressed the aerial refueling fleet, in OIF the aerial refueling fleet became a decisive point that adversary actions such as unconventional or asymmetric attacks against the fleet could have significantly hindered the achievement of Allied objectives. According to one post-war commentator, Colonel Walter Boyne, "the shortage of tankers

manifested itself early on, and preliminary analysis indicates that perhaps thousands of missions that would have otherwise been flown were not, because of the tanker shortage."[34] Luckily, once again, all of the challenges were overcome by using the tanker assets "more intensively, despite the problems of crew fatigue and the never-ending maintenance needs of forty-year-old aircraft."[35] The tanker shortage could have been exploited by the Iraqi forces if they had decided to demonstrate their current talent for improvised explosive devices and conducted operations against the high-demand tanker fleet at some of the main operating bases. It was also fortunate that the Iraqi air defenses were eliminated early during the conflict since tankers were stationed farther forward than they have historically been placed to allow aircraft additional loiter time to attack emerging or time sensitive targets.[36] Although the relative vulnerability of the tanker fleet was not exploited by the Iraqis during OIF, apparently some observers have begun to take notice of our dependence on our tanker fleet and have begun to target them. For instance, China is now assessed to be developing a long-range, air-to-air cruise missile specifically designed to attack aerial refueling assets.[37] This fact should provide impetus for the services to develop and install defensive suites for the various tanker aircraft.

A continuing requirement, and one that may face additional pressure in the future due to the aging of the fleet and the postponement of the initiation of recapitalization efforts, is the allocation of big-wing tankers to support the joint forces. OIF demonstrated that the United States is very dependent on its big-wing tanker fleet to augment the organic tanking capability resident among the services. For instance, "only twenty-four Lockheed Martin KC-130 tankers were assigned to the region" by the Marine Corps.[38] These tankers supported a force of 350 fighters and helicopters.[39] In addition, the KC-130s were used

extensively as transports to resupply the fast moving Marine forces.[40] To allow the Marine Corps to "surge" its close air support assets, the F/A-18s and AV-8Bs, it had to rely on the big-wing tanker force.[41] This reliance on the big-wing tankers was illustrated by the fact that the U.S. Air Force delivered 188,196 tons of fuel out of a total of 208,569 tons. The second largest supplier of fuel was the Allied forces at 9,442 tons.[42] See Figure 1 for a breakdown of aerial refueling by service.



	Tons of Fuel
USAF	**188,196**
USN	**4,658**
USMC	**6,273**
Allies	**9,442**
Total	**208,569**

Figure 1 – Aerial Refueling in Operation Iraqi Freedom by Service[43]

Future Battlespace/Trends

The likely future battlespace of central Asia, the Pacific Rim, and Africa dictate that a robust aerial refueling capability should be maintained by the U.S. military and endorsed by the CCs. Since the great preponderance of U.S. strike aircraft are fighter-sized without intercontinental unrefueled ranges, aerial refueling capability will be required for these assets to reach their targets from international waters or from cooperative neighboring states. For instance, one potential future battlespace will be over the control of the island of Taiwan. The nearest air bases to the capital city, Taipei, are on Okinawa, approximately 400 miles away. Other potential bases, on South Korea, Southern Japan, or the Philippines, are 700 to 900 miles away. In the worst case scenario, where access to foreign bases was denied by

their governments, the nearest U.S. air base would be on Guam, approximately 1,700 miles away.[44] Therefore, for land-based airpower to effectively and efficiently support carrier-based units in the defense of Taiwan, it will be highly desirable on the part of the United States to maintain a robust tanker fleet. Likewise, since a stated goal of the Chinese military in a showdown with the United States is to sink an aircraft carrier, even the carrier-based forces would probably greatly benefit from the support of big-wing tankers to augment their organic aerial refueling capability. Big-wing tanker support would free up carrier assets for fleet defense and strike missions and allow the carriers to be positioned in more easily defended locations away from Chinese anti-ship threats. Furthermore, since many areas within the Pacific Rim and Africa lack the infrastructure to bed-down a big-wing tanker force, these restrictions may limit the number of tankers that can be effectively utilized to support joint and coalition air forces. Therefore, for future joint operations, even small numbers of tankers may be key assets for the combatant commander as they were for the Argentines during the Falklands/Malvinas conflict.

Emerging trends, including the transformation of the U.S. military to a lighter and more expeditionary force, the ability of long-loiter airpower to deliver on-call, precision CAS, and munitions miniaturization, all suggest that U.S. ground forces will become more reliant on airpower for direct fire support in the future and therefore more reliant on flexible tanker forces. For instance, since lighter forces are more reliant on non-organic fire support and since the U.S. military was very successful delivering on-call, precision CAS for ground/Special Forces in OEF and OIF, it is highly likely that the demand for aerial fire support will only increase in the future. Moreover, munitions miniaturization from 1000 lb JDAMs to 250 lb small diameter bombs (and continuing improvements in precision-guidance

technologies) should also increase demand for aerial fire support due to decreased fears of collateral damage and unintended consequences. Therefore, CCs and their staffs should take these emerging trends into account when developing their estimates for aerial refueling requirements for future joint operations.

Flexibility is still the Key to Airpower

Since the U.S. military may not be able to recapitalize the entire aerial refueling fleet due to budget pressures, the CCs should support efforts to increase the flexibility and affordability of the tanker fleet. One way to increase the flexibility of the existing tanker fleet to meet the needs of joint and coalition air forces is for the USAF to deploy a system on its KC-135R fleet that would allow it to conduct boom or drogue operations on the same mission similar to the current capability of the KC-10 fleet. Currently, USAF only has enough drogue and hose systems available to equip approximately half its KC-135 fleet. Unfortunately, the aircraft must be configured on the ground prior to the mission for either boom or drogue operations. A second method to increase the flexibility of the tanker fleet would be for the USAF to increase its multipoint refueling capability. USAF has added multipoint refueling capability to twenty KC-135R and fifteen KC-10 aircraft.[45] These aircraft have two drogue and hose pods on each wingtip that allows them to refuel two fighter-sized aircraft simultaneously. Although the future tanker program has not been fully defined, the Air Force currently plans to equip its next generation tanker fleet with multipoint refueling capability.[46] By fully exploiting multipoint refueling in the next generation aircraft, the RAND Corporation estimated that the USAF could reduce the size of its tanker fleet by 17 - 50% depending on the scenario studied. Regardless, a 17% reduction in tanker requirements would result in 91 fewer aircraft needing recapitalization.[47] To take full

advantage of a multipoint capable tanker fleet would require the Air Force to switch the aerial refueling method for its future fighter-sized systems from boom to drogue operations. A final option to increase the flexibility of the tanker fleet would be to ensure that the future wide-body tanker had an austere field capability. The KC-135 and KC-10 are dependent on improved airfields for operations. A future system that could operate from unimproved runways would allow more bed-down options for joint planners and CCs.

Operational Risks

If the cost of recapitalization proves untenable to the American taxpayer and if steps are not taken to shore up tanker basing rights or improve our ability to conduct tanker operations from austere fields, then the CCs will be forced to accept higher levels of risk in their operational plans. These risks will be due to a decreased ability to mass and synchronize joint fires in the battlespace and maintain a high tempo level in their air operations. Symptoms of these issues were certainly visible during OIF but luckily did not approach the level of problems experienced by the Argentines during their air operations over the Falklands/Malvinas. Other risks will result from a decrease in the flexibility of their air assets, more predictability and less freedom of action in the employment of those assets, and less ability to overcome friction and project power across the breadth and depth of the battlespace. These issues will certainly result in greater risks for air crews and may force the U.S. military to rethink its reliance on airpower for air interdiction and support of ground forces in contact with the enemy.

Alternatives: Space-Based or Long-Range Strike Capabilities

Some might propose that the CCs simply push for the development and fielding of space-based strike capability, like the common aero vehicle, or the development and fielding

of additional long-range strike capability to augment the existing fleet of B-1s, B-2s, and B-52s. Although the common aero vehicle (CAV) could represent an incredible leap-ahead technology allowing the United States to project significant striking power anywhere on the globe in a manner of minutes, it is a new and unproven weapon system. In addition, basing CAVs on-orbit could face a significant battle in the political arena (concerns range from "keeping weapons out of space" to Russian fears of an undetectable U.S. first strike capability against its nuclear deterrent forces) and CAVs launched using reusable launch vehicles or retired intercontinental ballistic missiles would be expensive. Others might contend that the United States should recapitalize and augment its long-range strike forces instead of recapitalizing the tanker fleet. Although a better mix of assets between long- and short-range strike weapons systems would probably better meet the future needs of the U.S. military, putting all of our proverbial eggs in the long-range strike basket would probably not be the most effective or efficient means to provide joint warfighting capability for U.S. policymakers. Instead, an appropriate mix of long-range and fighter-sized aircraft would probably best support the future CC. Likewise, since the U.S. fleet of big-wing aircraft including command and control, intelligence, surveillance, and reconnaissance, air mobility, and even the U.S. long-range strike forces are all users of aerial refueling capability, the United States must maintain a robust tanker fleet or be willing to significantly change the way the U.S. military currently employs its forces.

Conclusions and Recommendations

The tanker fleet represents a critical national asset that helps the U.S. military efficiently and effectively project power across the globe. The fleet of 602 KC-135 and KC-10 aircraft, augmented with Navy, Marine Corps, and in some cases Allied tankers, allows

the U.S. military to defend the homeland, conduct prompt and sustained combat operations, and provide humanitarian assistance. They represent a key force enabler that permit U.S. aircraft to fly farther, remain airborne longer, respond to adversary actions and threats, and deliver more munitions, equipment, and supplies. Without a robust tanker fleet, U.S. military operations will take longer to complete and risk higher casualties. The last three major U.S. operations leveraged and relied upon the aerial refueling fleet to accomplish their objectives. In the last major operation, OIF, 25% of all USAF sorties flown were tanker missions (6,193 out of 24, 196).[48] Without the recapitalization of the tanker fleet and upgrades to existing systems, the United States will find it difficult to successfully execute its war plans, conduct humanitarian operations, or support special missions. In essence, the joint tanker fleet is needed to execute the U.S. military strategy. In recognition of its importance to the joint fight, the recapitalization and upgrade of the tanker fleet should be elevated to a position near the top of every combatant commander's integrated priority list, and commanders should take a personal interest in ensuring that sufficient tanker infrastructure is developed and negotiated in their AOR.

Although the Air Force is currently conducting a classified study to assess the procurement and operational requirements for the next-generation tanker based on the new U.S. military strategy, this survey of recent U.S. operations highlighted several areas that CCs should consider regarding their existing and future tanker assets. The first recommendation is that CC's staffs carefully study and plan for challenges associated with tanker bed-down and basing. The staffs should also plan for assessment teams to survey potential sites once crisis action planning begins and should also assess the impact of emerging trends on their estimates for aerial refueling requirements for their operations

plans. Due to the large size of the big-wing tanker fleet and the current requirement to recapitalize large classes of weapons systems, an associated recommendation is that CCs suggest the services maintain an appropriate mix between austere-field capable tanker aircraft (C-130 fleet) and those that require developed airfields since all the services will be tempted to cut existing fleets to help pay for new procurements and the likely future battlespace (central Asia, Pacific Rim, and Africa) lacks the infrastructure of Europe or Southwest Asia. The other alternative is that the services develop a future KC-135/KC-10 replacement that has austere field capability. In addition, the U.S. military should also investigate technologies and the associated procedures and training necessary to open and perform tanker operations from austere bases.

An additional recommendation is that commanders push for the incorporation of defensive capabilities for aerial refueling assets (or for at least a subset of the fleet) to reduce their vulnerability and support widespread adoption of multipoint refueling capability in the existing and next generation tanker fleet. An associated recommendation involves supporting a change in the proposed Air Force joint strike fighter procurement to switch the aerial refueling method from boom to drogue. This switch to the Navy and Marine Corps (and most Allies) system could reap significant benefits in terms of a reduction in next generation tanker fleet-size requirements.

Over the past several years the U.S. military has gone through a paradigm shift and now recognizes the critical importance of strategic mobility to the joint fight. The need for C-17s, equipment pre-positioning ships, and fast sealift ships is now a well-known and recognized fact by the combatant commanders and the service chiefs. Hopefully, aerial refueling capability will receive equal emphasis in the years ahead and the recapitalization of

the fleet will result in a smaller, but more flexible and capable fleet able to support the full range of 21st Century joint operations. Only history will be able to judge if it was correct for Secretary Teets to put the recapitalization of the tanker fleet before the recapitalization of the air superiority fleet.

Notes

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[33] Hunter Keeter, "Tanking, 'Bring-Back' Highlights of Super Hornet's Performance," Defense Daily, 218 (2 June 2003).

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