AIR COMMAND AND STAFF COLLEGE

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AIRPOWER PROJECTION IN THE ANTI-ACCESS/AREA DENIAL ENVIRONMENT: DISPERSED OPERATIONS

By
Russell S. Badowski, Maj, USAF

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Advisor: Colonel Shannon W. Caudill

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Abstract

This paper examines the difficulty with traditional power projection models in an Anti-Access/Area Denial (A2/AD) environment and offers an alternative, affordable, and practical solution to Combatant Commanders who seek to retain power projection capabilities in this new environment. The US Air Force has consolidated its global operations onto a dwindling number of forward bases that are increasingly held hostage to adversaries who are gaining precise and lethal technologies that can deny those bases the ability to generate airpower. The existing attitude that our defensive resolve will overcome the capabilities and will of potential adversaries has been supported by recent experience in Iraq and Afghanistan. However, as the US transitions to a new A2/AD operational reality, leaders must question this mentality and look at the increased risk while assessing alternative ways to project airpower within the means currently available. Moving forward, leaders must introduce technology and training that supports dispersed power projection models; Service and Combatant Commanders must ensure functional staffs understand and embrace the risks driven by a dispersal strategy, and major commands must alter how they present forces through Unit Type Codes (UTCs) to accommodate force packaging that enables a dispersal operating model. Dispersed operations present both opportunities and risks. In order to fully assess the practicality of dispersed operations as a way to project airpower, this paper breaks down a case study of the Rapid Raptor concept. The risks with executing a dispersed model are analyzed and mitigation measures are presented to ensure that the ability to project airpower is not threatened by current operational realities.

Introduction

In 2012, the Department of Defense (DoD) issued guidance that the US armed forces must generate and maintain an ability to "Project Power Despite Anti-Access/Area Denial (A2/AD) Challenges."[1] Current Air Force aircraft, bases, and power projection models provide the available *means* and *ways* with which the Air Force seeks to achieve its contribution to the *ends* laid out by this strategic guidance. Meanwhile, technology available to adversaries continues to advance in precision and lethality; resulting in a basing construct that is held hostage under an increasingly capable threat. Unfortunately, the significant resources, manpower, and effort applied to actively defending these bases are being outstripped by the capabilities of adversaries; and thus the risk of reliance upon these bases is escalating rapidly. Moving forward, leaders must introduce technology and training that supports dispersed power projection models; Service and Combatant Commanders must ensure functional staffs understand and embrace the risks driven by a dispersal strategy, and major commands must alter how they present forces through Unit Type Codes (UTCs) to accommodate force packaging that enables a dispersal operating model.

The joint force is actively looking at alternative and realistic *ways* to utilize available *means* to project airpower into an A2/AD environment without reliance on established bases or significant increases in resources. However, these new ideas challenge conventional thinking about the Air Force's power projection model and the risks associated with that model. The current model presents an acceptable level of risk in the permissive environments in which we have operated for the last several decades. As that permissive environment gives way to the A2/AD environment of tomorrow, the

associated risk to airpower escalates rapidly to an untenable level. There are options available to senior leaders to mitigate some of this risk through dispersed operations; but they must accept and facilitate a new model for airpower projection that presents risks of its own. Service leaders with administrative control must train and equip the warfighter for these new roles and risks; while warfighting leadership must prepare the battlespace and employ forces utilizing a dispersed operating model that ensures airpower will be available in an A2/AD environment.

Current Model

The Air Force has made power projection into an A2/AD environment a mission priority as evidenced by the procurement of advanced fifth generation aircraft; which maintain capabilities to operate in non-permissive environments. These aircraft represent the A2/AD kinetic airpower projection capabilities of the Air Force for the foreseeable future. However, the "inter-related factors of aircraft characteristics, aircrew fatigue, combat mission profiles, aerial refueling requirements, sortie rates, and aircrew to aircraft ratios" dictate that the fighters operate from bases within 1,000 to 1,500 miles of their objectives.[2] The current concepts of operation for fighter employment and power projection models are predicated upon a small and concentrated set of forward operating bases which provide centralized hubs for logistics, command and control (C2), and other support functions. These operating bases are located within appropriate operational ranges to potential hot spots around the globe, but the number of bases has been reduced by the drawdown that occurred following the Cold War.[3] The few remaining forward bases serve as a gathering point for all of the capabilities which the US seeks to have at its ready disposal, and have grown in size and scope of mission.[4]

In the current environment, the centralization of capabilities onto fewer bases creates multiple benefits with little risk to planners and decision makers. With fewer bases the costs for infrastructure and logistics are reduced, manpower requirements are concentrated, and C2 becomes more efficient and robust. In the current fiscal environment and with the geopolitical focus on relatively permissive air environments, decision makers have accepted the risk of reliance upon this power projection model – assuming that the base's potential value as a target is easily overcome by the primacy of our defensive capabilities relative to adversary capabilities and will. A contingent of academics and operators has followed the rapid changes that are occurring in the operating environment, and have raised the flag about the risks that these bases will face in the near future.[5] Indeed, the technological advancements of potential adversaries have outstripped our defensive capabilities in a way that places these hubs at much greater risk as a strategically valuable target.

The benefits derived from the current power projection model are warranted only if the accompanying array of infrastructure and presence are secure from attack. The doctrinal concept of Integrated Defense has come to dominate a base commander's agenda, as these leaders indicate their willingness to actively secure installations to the utmost of their abilities.[6] There has risen an unspoken dictum that requires military and civilian leaders to actively defend people, assets, and bases regardless of the costs involved.[7] The vast assortment of defense based weapons such as the Patriot Missile System, Aegis destroyers, and the newer Terminal High Altitude Area Defense System have all been designed to provide security for bases around the world.[8] Career fields such as Security Forces and Office of Special Investigations have received wider mandates to

secure bases much more robustly than in previous decades.[9] Additionally, base commanders have become intimately involved in base defense plans, and are actively seeking new capabilities and competencies that will help to secure bases. Finally, advanced Professional Military Education courses have been developed that seek to provide insight to the problem of how to defend airbases despite growing threats.[10]

All of this investment and guidance has been implemented to find the correct combination of *ways* and *means* to reduce the risk associated with our ability to project power. The ability to defend our forward postured forces under recent contextual settings has been relatively successful, but it has bred a sense of complacency that our defenses can and will prevail against any threat. The US military lost a trivial number of aircraft to base attacks in Iraq and Afghanistan, and never lost the ability to use an airfield for more than a limited period in those wars.[11] The risks associated with this mentality are deemed acceptable…in the current operational environment. However, adversaries increasingly possess the potential to upset that operational environment in a way that changes the risk calculus in their favor.

The New Operational Context

In this new environment, advanced technologies provide precision and lethality with which adversaries can hold our forward presence at risk.[12] The Chinese have procured Short and Medium Range Ballistic Missiles, Cruise Missiles, Armed Unmanned Aerial Vehicles (UAVs), Rockets, and Air-Surface Strike capabilities in an effort to create a realistic, credible, and redundant umbrella under which its adversaries must operate.[13] Of specific concern are the increased range and precision of future weapons

such as the DF-4, DH-10, and D-3A which could easily be used for attacks beyond the first island chain.[14] Additionally, Chinese strategists have stated:

> *To achieve air superiority, long distance firepower must be applied to 'control the air through the ground.' Enemy combat aircraft would be suppressed or destroyed on the ground, and/or blockaded inside their bunkers; thus making it difficult for their air combat forces to play an effective role.*[15]

There are examples of how this line of thinking has been accepted around the world by a variety of potential adversaries, and how it has become a global problem for US forces.[16] The acknowledgment that technology and strategy are aligning in a way that allows our adversaries to threaten the limited number of bases from which our air power originates forces planners to reassess the practicality of the current power projection model.

The new dynamic creates a situation where planners are forced to reconcile an increased level of risk within the existing *ends*, *ways*, and *means* framework. Efforts to maintain a superior defensive capability in response to an increasingly complex and capable adversary are costly and the results are often short-lived.[17] The effects of down-sizing and prioritized budgets are that the US finds itself in a situation where the *means* cannot be significantly altered in a manner that will create a long term advantage. The *ends* are dictated by politicians; and as evidenced by the mandate to maintain the ability to project power into an A2/AD environment, they have not yet been altered by the changing operational realities. All of this taken together forces the remaining two variables, risk and *ways*, to account for the changes in the new A2/AD context.

Without fundamentally altering the established models that rely on forward operating bases, planners are accepting the increased risk of the new threat environment. As the threat grows, so too will the risk involved with the current basing constructs. Adversaries are increasingly capable of completely denying US power projection through

their ability to hold our forward bases hostage. Long term procurement plans to acquire new technology and longer range weapons systems will help to mitigate the problem, but not in the near future. In the period before these new *means* become available, leadership must assess if the risk of maintaining the status quo is acceptable. Eventually, the untenable risk associated with the difficulty of defending the bases from which airpower is projected will force leaders to look at alternative *ways* to project power.

Alternative Option: Rapid Raptor Case Study

The ability to defend forward operating bases has been a concern since long before this current threat began to materialize. During the Cold War, bases in Europe developed resiliency plans, which included hardening measures and options for dispersed operations in the event of a Soviet attack.[18] The 1987 RAND study titled "Tactical Dispersal of Fighter Aircraft: Risk, Uncertainty, and Policy Recommendations" called for a complementary system of Main Operating Bases and Dispersed Operating Locations that would complicate Soviet targeting in the event of conventional hostilities.[19] In a related article in the *Air Force Journal of Logistics*, Lieutenant Colonel Price Bingham argues that two options are available for base defense. The first option, still in practice, involves "hardening measures, active defenses, and rapid repair capabilities."[20] The alternative is a strategy that "depends on dispersal, mobility, concealment, and deception measures for survival."[21] A key point from both studies is the requirement for an aircraft that is capable of, and effective at, operating from dispersed locations. Despite this desire to attain a capability for dispersed airpower, the concept never achieved an operational status. The downfall of the Soviet Union and other geopolitical realities allowed the predominant thinking to grow into current projection models. Bingham's first option was

entrenched in Air Force planning, and the idea of using dispersed bases for conventional forces fell out of favor.

In response to the new operational context, the joint force has developed alternative plans. In an attempt to find new *ways* to achieve strategic objectives, and mitigate some of the risks of the current construct; small teams of F-22 planners (including both operators and maintainers) have sought to reinvigorate the concept of dispersed operations with the advent of "Rapid Raptor". The F-22 is the aircraft that was ostensibly designed to allow for the implementation of the 1987 studies' dispersal recommendations. This concept of a dispersed power projection capability will provide a case study that will focus the discussion on how new *ways* to project airpower will alter the risks in this updated threat environment.

Rapid Raptor is a concept that seeks to utilize Bingham's second option for defending airpower. Reliance upon "dispersal, mobility, concealment, and deception" techniques is a cornerstone of this new model.[22] The concept assumes that large bases may be unusable due to the inability to effectively defend against adversary attacks. Instead, Rapid Raptor seeks to utilize any available and appropriate runway for limited power projection requirements. There have been several iterations of the plan, beginning with a version described in a 2014 paper titled "Forward Arming and Refueling Points for Fighter Aircraft: Power Projection in an Anti-Access Environment."[23] As it has evolved, the plan has solidified into a variety of flexible deterrent options that a Combatant Commander can use for power projection in the form of strike, alert, show of force, and presence missions. Rapid Raptor pairs a four-ship of F-22s and a single C-17 loaded out with a package of support equipment that is dependent upon the mission tasked.[24] The

operations and maintenance team of approximately 50 individuals are capable of rapidly deploying to any suitable runway within the operational area and successfully completing an assigned mission of limited duration.[25] General Herbert Carlisle, Commander of Air Combat Command, recently used Rapid Raptor as an example of how the Air Force will "rely on airmen's abilities to create innovative solutions…to help utilize existing weapons systems and cultivate tactics, techniques, and procedures" for future operations.[26]

This updated model for power projection appears to offer a quick fix to a difficult problem. It offers new *ways* to achieve the *ends*, without a significant increase in the *means* available. However, before leadership can implement it as a plan, there must be a broad based analysis and understanding of the risks associated with its implementation. The concept was designed to counter the existing risk of reliance upon a limited number of operating bases that fall under a potential threat. While Rapid Raptor may minimize that risk, it also presents new and different risks of its own. Despite the difficulty of comparing one form of risk to another, a critical understanding of the risks associated with the different airpower projection models will allow a dialogue and foster effective decision making across functions and levels of command. Rapid Raptor presents three broad risk areas that must together be weighed against the risk faced by strategic base defense.

Risks to Dispersed Operations

The primary risk associated with Rapid Raptor falls on logistical functions. The concept assumes the F-22s will project power for a *limited* time and on very specific mission sets, then cycle back to a base that has full F-22 support.[27] Utilizing the model

for a sustained conventional conflict will require several Rapid Raptor teams operating from a variety of locations, cycling into and out of theater on a semi-regular basis.[28] Additionally, without the support and infrastructure of an established base, sustained F-22 operations will potentially not meet current planned sortie or mission capable rates, and the likelihood of not delivering an assigned mission may grow. As the duration of the deployment extends, the risk of not delivering on individual missions will also likely increase. The limited personnel and equipment associated with a Rapid Raptor package can only do so much to ensure the aircraft is mission ready, and some fixes may potentially require more intensive maintenance than what would be available.[29]

Another aspect of the logistical risk is associated with a reliable source of jet fuel. The different variants of the Rapid Raptor model have sought to deal with this in one of two ways. One option is to fly the fuel into the airfield using tankers or specially modified C-17s.[30] This option allows for a reduction in the reliance on local procurement, but ties up additional aircraft and resources. The second option requires that the suitability of a runway as a dispersed operating location be dependent on the availability of locally procured jet fuel. Regardless of the source of fuel, the team will not have the support of a dedicated and reliable source for their needs.

The logistical risks of a dispersed model exacerbate the fears of functional areas that grade themselves on delivering mission ready aircraft to the Combatant Commander. Leaders must be willing to drive the Rapid Raptor teams to deliver sorties, while acknowledging the logistical challenges involved. Standardized metrics for performance and effectiveness must be developed at all levels of command that have a strategic viewpoint, rather than focused on day to day sortie production. Another option to quell

some of these fears would be to preposition parts, tools, equipment, and fuel at various locations that could be accessed by the team in the event they were needed. Regardless of the functional imperatives driving caution, leaders must ask if the risk of losing a handful of sorties for logistical reasons outweighs the risk of losing all the sorties due to a strategic base attack.

The second primary risk associated with a dispersed airpower projection model falls on command and control. As a doctrinal concept, centralized control with decentralized execution has been a paramount, yet misunderstood, feature of Air Force operations since its founding.[31] In recent times, the Air Operations Center (AOC) has consolidated control and leveraged technology to ensure the Combined Forces Air Component Commander (CFACC) has the ability to C2 forces through the dissemination of details via the daily Air Tasking Order and other associated documents.[32] The notion that airpower must be centrally controlled by a CFACC in the AOC has become fundamentally entrenched in Air Force culture over the last four decades.[33] Without the infrastructure to support secure communications or information systems to allow for rapid data transfer, the ability to disseminate these details to dispersed teams becomes problematic. Proper C2 of assigned forces allows the AOC to take advantage of the speed, reach, and flexibility of airpower. There is technology that can be leveraged to ensure limited data can be transferred to the dispersed teams, but not with the reliability and capacity that commanders have come to expect. These technologies must be fully embraced if Rapid Raptor is to succeed at projecting airpower. The ability to designate specific targets, times, or other mission specific details ensures that tactical units are tied

into a broader strategic perspective for a campaign, and any degradation in that ability has the potential risk of reducing combat effectiveness.

General Martin Dempsey released his white paper on mission command in 2012. The idea that leaders should provide intent, limitations, and ensure mutual understanding throughout the chain of command; all while fostering responsible decentralized thought and execution in a complex and dynamic environment is not novel.[34] The Air Force, however, has had difficulty fully adopting this mentality with respect to airpower as evidenced by the lethargy in finding adaptable C2 structures that operate subordinate to the CFACC and AOC.[35] The concept of Distributed Control has been addressed by senior Air Force leaders, and offers some guidance on the way ahead; however, the concept has not been fully incorporated into day-to-day operations.[36] Dispersed operations such as Rapid Raptor are based on the actualization of the mission command and distributed control concepts. A more adaptable C2 architecture that has established mechanisms, relationships, and authorities is required to take full advantage of the capabilities presented by dispersed operations. The question for decision makers is whether the requirement to project airpower in an A2/AD environment warrants a reduction of centralized control in favor of mission accomplishment. Does the risk of embracing adaptable C2 architecture and potentially losing AOC oversight outweigh the dangers posed to executing the mission from strategic hubs?

The final area that faces an increased risk when executing a dispersed power projection model involves force protection. Rapid Raptor is designed to operate from any airfield, which may or may not have a security presence available. The intent is to utilize surprise and deception by maintaining a small footprint, making it difficult for

adversaries to find the origin from which the airpower is generated in order to complicate their targeting. Due to the small footprint, the defensive measures which have become requisite for base commanders may not be available to the deployed team. They operate outside the layered defenses found at main operating bases, and the plan undermines the dominant thinking on Integrated Defense measures. The team becomes susceptible to attack or exploitation if their operating location is discovered. The most likely attack would come from the adversary using the weapons already discussed, but there is potential for a smaller attack originating from a local threat near the dispersed base. Regardless, the Rapid Raptor team will not have established force protection capabilities and will be forced to rely on the limited capability with which they deploy. Leaders must determine if this increased risk to people outweighs the risk to mission from operating at threatened bases with existing security layers.

There are options to mitigate the dangers that dispersed teams face from every possible attack. The dispersed nature of the model counters the most likely threat, but this could be augmented by concerted placement of ballistic missile defense systems in theater. With respect to the ground threat, an example from the Cold War presents a case for including members of security forces on the Rapid Raptor team. The Air Force briefly employed small teams for the Ground Launched Cruise Missiles (GLCM) in Europe in the 1980s. These teams were comprised of the operations, maintenance, and security personnel necessary to operate from dispersed locations without any other external support.[37] The downside to this option for the F-22 team is the limited space available on a single C-17 allocated to people. Current Rapid Raptor planning utilizes all of the available seating for maintenance and operations personnel, and adding security teams

may reduce operational capability.[38] Leaders will have to determine the appropriate mix for the team based on the operating locations and perceived threat.

A second option to mitigate some of this risk is for Combatant Commanders to proactively use Security Cooperation partnerships to bolster indigenous security procedures around potential operating locations.[39] Certifying that local forces understand the necessity to provide secure perimeters and oversight will ensure airfields are relatively secure when and if a Rapid Raptor team was sent there. This preemptive measure does not necessarily require additional funds, but a level of focus for the teams that are leading security cooperation endeavors in various locations around the globe. A perfect example of this concept in practice is Pacific Air Force Commander General Lori Robinson's current guidance for a "Places, Bases, and Faces" campaign in the Asia Pacific.[40]

Both of the previous measures would be incomplete without a final step. The members of a Rapid Raptor team have not had the appropriate training to deploy and provide their own security. The team members must be prepared, with or without augmentation, to provide for basic security of the operating location. The plan has the team deploying with small arms and limited battle armor, but has not addressed the fact that they may have to set up a perimeter and know how to defend that perimeter from local threats.[41] Another aspect that must be addressed would be to what extent they should be prepared to fall back, and the repercussions of losing tools, equipment, and potentially aircraft to an attacking force. Much of this danger can be addressed with a careful selection of the operating location, but the training of team members should still include contingency considerations.

Challenges to Change

The discussion of the specific risks involved with the Rapid Raptor concept provides insight into the challenges that would be faced with any dispersed power projection model. The three broad areas of risk – logistical, C2, and force protection – form the basis from which an informed dialogue must commence regarding the benefits of this new model over reliance on strategic basing models. There is no doctrinal framework that guides risk assessment, so it falls to operational art as exercised by the commander and his planning staff to conduct this dialogue and reach the appropriate conclusions.[42] Unfortunately, the bureaucratic resistance and risk averse nature of the military makes it difficult to argue for the far reaching changes required to implement an entirely new power projection model.

Overcoming structural impediments to implementing these new *ways* requires commanders to alter existing thought processes, metrics, and established practices. Rapid Raptor has been proven as an operational concept through multiple trial runs where teams deployed to established air bases within US jurisdiction.[43] Without a commander's proactive participation that forced disparate functional involvement, these trial runs would never have occurred, lessons would not have been learned, and the concept would have floundered. The commander was paramount to overcoming the functional backlash that arose due to nonstandard operational practices. It is this type of support and experimentation that will allow commanders to break down the structural barriers – established metrics, Technical Orders, existing operating instructions, etc. – and the bureaucratic resistance associated with those barriers.

In addition to structural impediments, commanders seeking to implement these new *ways* must deal with risk aversion. There has always been a hesitation to try something new – people intrinsically fear change. However, experience shows that the military force as a whole has become more risk averse in the past several years. While some of the proof for this is anecdotal, as evidenced by the myriad generals and admirals who speak at Air University, there has been one Department of Navy study that captures a widespread concern with risk aversion.[44] The sentiment in the study is that leaders are hesitant to alter the status quo for fear of the repercussions if something were to go wrong with a decision they make. Regardless of the validity of a growing risk aversion; the current reality that holds *ends* and *means* constant, forces commanders to find an acceptable risk among a variety of *ways* to find the best solution to a strategic problem.

Recommendations

The current power projection model faces an unacceptably higher risk when it is transposed from a permissive environment into an A2/AD environment. This increased risk can be mitigated by following a dispersed power projection model that would reduce the total risk by negating the most likely and dangerous threat while transferring any residual risk across several functional areas. These individual functional areas may be subject to a greater risk than that to which they have become accustomed in the last several decades; however, the ability to project airpower would be preserved at a lower total risk than if the current power projection model were used in the new operating environment. In order to ensure this new model becomes an operational reality, and to prepare some functional areas for a changing risk structure, senior leaders can and should be proactive to train, equip, and employ forces within this new construct. Therefore,

leaders must introduce technology and training that supports dispersed power projection models; Service and Combatant Commanders must ensure functional staffs understand and embrace the risks driven by a dispersal strategy, and major commands must alter how they present forces through Unit Type Codes (UTCs) to accommodate force packaging that enables a dispersal operating model.

As the provider tasked with presenting forces to the warfighting leadership, US Air Force Major Commands (MAJCOMs) must strive to deliver the training and technology necessary to implement this concept. This includes the opportunity to practice and refine the skill sets necessary to accomplish the mission via realistic exercises, as well as the technology that will enable and enhance dispersed communications and adaptable C2. In addition to preparing individual units, the MAJCOMs must ensure the functional staffs are aware that there will be risk that is transferred to their areas of expertise. It is critical that all functional hierarchies understand the vision and rationale behind a dispersed power projection model so that leaders across the chain of command do not generate undue bureaucratic resistance and are willing to accept a changing risk structure. Finally, MAJCOMs must present forces following an updated model of power projection. The current force packaging structure, Unit Type Codes (UTCs), which can be employed by Geographic Combatant Commanders (GCCs) are organized on an assumption that the force will be forward deployed within the current model. Altering the UTCs to accommodate force packaging based on dispersal must be accomplished in conjunction with a discussion that will educate the GCCs on these updated force packages.

As the warfighting leadership, GCCs and CFACCs must actively find ways to employ Air Force units that follow a dispersed power projection model. Typically, GCCs employ these units for four- to six-month rotations, such as a Theater Security Package or Continuous Bomber Presence, that utilize outdated force packaging and established power projection models. An updated plan to employ these units at various locations sporadically throughout a period of time would save money, continue to provide assurances to our allies, and still provide a presence in the theater of operations. Additionally, GCCs must be proactive with ongoing theater security cooperation measures that will enable dispersed operations. By focusing these cooperative measures on areas that will benefit dispersed operations, GCCs can ensure effectiveness and help to mitigate some of the risks involved with dispersed operations. As the senior Air Force officer in theater, the CFACC must enable an adaptive C2 architecture that will allow dispersed operations to take full advantage of the capabilities they offer. This may entail a reduction in the influence and authorities of the CFACC and AOC; and must be built on a level of trust and understanding with the dispersed teams, the subordinate Joint Task Forces to which those teams may be allocated, and any command/coordination elements in between.

Conclusion: Defending Airpower Projection Capabilities

In conclusion, as airpower pioneer General Billy Mitchell once said, "In the development of air power, one has to look ahead and not backward and figure out what is going to happen, not too much what has happened."[45] New technology, shifting regional power tensions, and the persistence of ground threats to air bases has conspired to create a new reality for future airpower operations. If American airpower is to maintain its

lethality, it must focus more effort on initial survivability. Leaders must act now to introduce technology and training that supports aircraft dispersal, ensure functional staffs understand the risks driven by a dispersal strategy, and alter how they present forces to accommodate force packaging which better enables the dispersal concept.

The capability to deploy units to dispersed locations and effectively execute a mission that does not rely on a limited number of bases lends credence to a strategic message that we can and will operate and project airpower into an A2/AD environment. GCCs and CFACCs who employ this model will gain flexible deterrent options that can provide tools to manage escalation in more direct and precise locations and under greater threat than would be available under current power projection models. Retaining realistic and credible deterrent measures will allow GCCs to prevent adversaries from taking advantage of a perceived unwillingness to deploy forces for small breaches of the international order, and will ensure airpower is available for global operations regardless of the operating environment.

Commanders must weigh the threat to established air bases with the risks to dispersed operations. The current airpower projection model faces a potentially existential threat, and leaders can no longer ignore this reality. Alternative models still include risks, in the forms of logistics, C2, and force protection. These risks can be addressed and mitigated by senior leaders to ensure we retain the ability to project national power, and more specifically airpower, into any environment. According to General Dempsey, "we must collectively promote a culture that values calculated risk as a means to generate opportunity."[46] Leaders at all levels should find ways to promote this

culture. Breaking down structural barriers and mitigating potential risks provides a starting point. The time is now for action.

End Notes

(All notes appear in the shortened form. For full details, see the appropriate entry in the bibliography.)

[1] US Department of Defense, *Sustaining U.S. Global Leadership*, 4.
[2] Bowie, *The Anti-Access Threat and Theater Air Bases,* 14. This study lays out fundamental problems with the current basing construct and the political and military threats to assured access for land based fighter aircraft power projection capabilities.
[3] Pettyjohn and Vick, *The Posture Triangle*, 82. Throughout this study, the authors provide insight regarding the mix of basing arrangements that are available to US military planners and the relative strengths and weaknesses of different contextual arrangements. For the purpose of this paper, I am referring to the number of operating bases established for the purpose of long-term fighter aircraft generation and sustainment. According to these authors, there are only seven such bases abroad.
[4] Bowie, *The Anti-Access Threat and Theater Air Bases,* 19-30. This chapter identifies the paucity of runways available in different regions around the globe and highlights the myriad requirements for a typical base to operate as a hub for US fighter aircraft generation.
[5] Several studies have looked at the A2/AD environment and the risks to our current power projection model that relies upon forward deployed capabilities. The overarching thesis is that these bases are becoming increasingly susceptible to advanced threats, and thus the ability for the US to project airpower from these bases is no longer guaranteed. I list several of these studies here for additional reference.
Adderley, "Can't Get There From Here."
Bowie, *The Anti-Access Threat and Theater Air Bases.*
Cliff et al., *Shaking the Heavens and Splitting the Earth*.
Davis, "Forward Arming and Refueling Points for Fighter Aircraft."
Easton, *Able Archers*.
Haddick, *Fire on the Water*.
[6] AFDD 3-10, *Force Protection* and AFPD 31-1 *Integrated Defense*. These documents prescribe force protection measures for the people, assets, and bases that the US Air Force has stationed around the globe. During in-class lectures for an Air Base Defense class offered at Air Command and Staff College (ACSC), several former expeditionary wing commanders commented on the time and effort expended in pursuit of these objectives.
[7] Bowie, *The Anti-Access Threat and Theater Air Bases,* 61. Bowie notes that the US is currently engaged in multi-billion dollar contracts to defend against theater ballistic missile and intercontinental ballistic missile threats.
[8] Ibid, 62.
[9] Caudill, *Defending Airbases in an Age of Insurgency*, 339-363. The concluding chapter of this book summarizes lessons learned from the wars in Iraq and Afghanistan as ten propositions that enable successful base defense. The recommendations are influenced by the perspective of base defense from a Security Forces professional and are skewed towards the role of Security Forces and Office of Special Investigations in base defense.

This study also highlights the recent changes in doctrine and policy that have supported the measures identified as necessary for successful base defense.

[10] During Academic Year 2015, ACSC offered a year-long elective titled "Defending Airbases in an Age of Insurgency" for which this paper was originally written.

[11] A portion of the course work for the ACSC elective was to conduct research on the effectiveness of base attacks in Iraq from 2003-2012. The research was conducted at the Air Force Historical Research Agency at Maxwell AFB, AL. The research discovered that despite being attacked 1,964 times, the coalition as a whole suffered only 15 damaged aircraft throughout the campaign, with zero complete losses. While this does not speak to the time a runway was unavailable due to these attacks, no aircraft was ever lost for lack of a usable runway surface and operations were never suspended beyond a cursory recovery period following an attack. Data from Afghanistan will be forthcoming with the next academic year; however anecdotal evidence suggests a similar limited effectiveness of base attacks for that campaign with the caveat of the US Marine Corps losses at Camp Bastion.

[12] Haddick, *Fire on the Water*, 87-90. This section most succinctly identifies the problem of advanced precision weapons, but several of the studies mentioned previously highlight the extent to which forward bases are under increased threat of attack.

[13] Easton, *Able Archers*, 10. This study is conducted from a Taiwanese perspective, but the conclusions have ramifications for US forces in the Pacific theater.

[14] Davis, "Forward Arming and Refueling Points for Fighter Aircraft," 7.

[15] Quoted in Easton, *Able Archers*, 11. The original quotation is from a translation of Yu Jixun, ed., *Second Artillery Force Science of Campaigns*. Beijing: Liberation Army Press, 2004, 392.

[16] Adderley, "Can't Get There From Here," 6-10.

[17] Bowie, *The Anti-Access Threat and Theater Air Bases*, 62

[18] Berman, *Integrating Basing, Support, and Air Vehicle Requirements*. In his argument to incorporate basing considerations as a factor in future aircraft design requirements, Berman acknowledges the different measures available to protect against base attack. Additionally, see Halliday, *Tactical Dispersal of Fighter Aircraft*, 13-16.

[19] Halliday, *Tactical Dispersal of Fighter Aircraft*, 7-8, 28-29.

[20] Bingham, "Air Base Survivability", 2.

[21] Ibid, 2.

[22] Ibid, 2.

[23] Davis, "Forward Arming and Refueling Points for Fighter Aircraft," 11-17.

[24] Misiak to the author, email. Master Sergeant Daniel Misiak is a Production Supervisor in the 90th Aircraft Maintenance Unit, 3rd Aircraft Maintenance Squadron, 3rd Maintenance Group 3rd Wing, Joint Base Elmendorf-Richardson, Alaska. He was the subject matter expert for the Rapid Raptor proof of concept exercises conducted during the author's time as acting Director of Operations for the 90th Fighter Squadron. His expertise and insight was critical to a thorough understanding of the Rapid Raptor concept. In addition to the email and discussion, MSgt Misiak provided load plans and data sheets outlining the various configurations of the concept available to planners based on mission type. I am indebted to him for his inputs and information related to the capabilities and risks associated with this particular form of dispersed operations.

[25] Ibid.
[26] Quoted in Everstine, "ACC, PACAF Focused on Pacific Pivot."
[27] Misiak to the author, email.
[28] Ibid. Additionally, see Davis, "Forward Arming and Refueling Points for Fighter Aircraft," 20.
[29] Ibid.
[30] Davis, "Forward Arming and Refueling Points for Fighter Aircraft," 11.
[31] Hinote, "Centralized Control and Decentralized Execution," 3-12. Additionally see Hukill, "Air Force Command and Control."
[32] Carozza, "The Unspoken Consequence of Communications Technology," 10.
[33] Hukill, "Air Force Command and Control," 23.
[34] Dempsey, *Mission Command*.
[35] Hukill, "Air Force Command and Control," 23.
[36] Hostage and Broadwell, "Resilient Command and Control." This paper was written prior to an Air Force C2 symposium in January 2015 where Air Force leadership concluded that changing the tenet of *Centralized Control/Decentralized Execution* was not necessary since the concept of distributed control was already included in the underlying doctrine. However, the members of the symposium highlighted the need to foster a better understanding of how distributed control could be fully implemented across the range of military operations.
[37] Simpson, "GLCM – From Concept to Mission Complete," 3.
[38] Misiak to the author, email.
[39]Bowie, *The Anti-Access Threat and Theater Air Bases*, 53-56.
[40] Schanz, "Places, Bases, and Faces in the Asia-Pacific."
[41] Misiak to the author, email.
[42] Huber, "Operational Art and Risk," 67.
[43] Misiak to the author, email. There have been numerous wing and MAJCOM level exercises that have tested the capability to employ the Rapid Raptor concept. F-22 units at Joint Base Elmendorf-Richardson, Alaska and Joint Base Pearl Harbor-Hickam (JBPHH) have proven that the concept is viable with successful deployments to locations such as Eielson AFB, Alaska, JBPHH, Hawaii, and Anderson AFB, Guam. While deployed, these units relied solely upon tools, equipment, and personnel deployed with the Rapid Raptor team.
[44] Snodgrass, 2014 Navy Retention Study, 18, 38.
[45] William Mitchell, Winged Defense, P.P. Putnam's Sons: New York, 1925, 20-21.
[46] Dempsey, *Mission Command*, 8.

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