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**JOINT FORCES STAFF COLLEGE  
JOINT ADVANCED WARFIGHTING SCHOOL**

**INTEGRATING THE HIGH GROUND: ENABLING DEFENSE, CIVIL, AND  
COMMERCIAL SPACE SUPPORT TO NATION-BUILDING**

by

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A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

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## **ABSTRACT**

Since the 1991 Persian Gulf War, the employment of space capabilities has increased dramatically in combat operations. Experience from the ongoing contingency operations in Iraq and Afghanistan reveals that military planners employ space capabilities to enhance kinetic operations. This linkage occurs due to military planner's familiarity with the effects space capabilities bring to combat. As nation-building missions grow in frequency and scope in the twenty-first century, there will be an increased need to optimize space capability integration to support non-combat missions. This requires a paradigm shift and employment of space capabilities traditionally considered outside the scope of military uses. In order to achieve this end, the U.S. Government needs to enact three significant changes regarding the employment its organic space power: 1) reform doctrine and training; 2) enable sufficiency-of-government; and, 3) ensure integrating functions exist to bridge operations and plans at the appropriate levels. Through comprehensive enactment of the proposed recommendations, space capabilities will advance toward optimal employment for use in future U.S. led nation-building missions.

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## INTRODUCTION

Few events in the history of modern humanity forced society to rethink the rules that base all other things. In his book *The Pentagon's New Map*, Thomas P. M. Barnett defined these radical paradigm-changing events as System Perturbations.<sup>1</sup> On October 4, 1957, the Soviet Union caused a System Perturbation by launching the first man-made satellite, Sputnik, into orbit. The Sputnik launch added an entire dimension to the operational domain of mankind; the USSR had opened the Final Frontier to the world. Space provided man a new opportunity for scientific discovery, the potential for new resources, and a license to re-consider longstanding tenets of warfare by adding applications both in and through space. Colored by the emerging Cold War, the Sputnik launch ignited U.S. public and government resolve to remain one-step ahead in the perceived space race.

Much like the Sputnik launch, the September 11, 2001 terrorist attack (hereafter referred to as 9/11) was another System Perturbation, altering the paradigm of safety for the United States of America and Westernized states around the globe. The attack came at a time of relative peace for Western societies. Soviet Communism ceded its lure to the relative prosperity of the democratic West with the fall of the USSR in 1991. Tremendous American economic success throughout the 1990s was the norm. Although intelligence agencies were aware of the possibility of an attack on the U.S. homeland, the indications were insufficient to cause alarm within the top-most levels of the U.S. government. Prior to the attack, the U.S. defense establishment sought to reduce overseas commitments and conventional warfare capacity while determining the role of

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1. Thomas P. M. Barnett, *The Pentagon's New Map* (New York: Berkley Books, 2004), 260-261.

military power in the twenty-first century. The terrorist strikes against the World Trade Center towers and the Pentagon altered this tranquil view of the future. This event brought counter-terrorism, counter-insurgency, and nation-building operations to the forefront. The U.S. led operations in both Afghanistan and Iraq with the intent of destroying the sanctuary for groups who employ terrorist tactics. As President Obama reiterated in his address regarding the future U.S. involvement in Afghanistan, “None of this will be easy. The struggle against violent extremism will not be finished quickly, and it extends well beyond Afghanistan and Pakistan.”<sup>2</sup> U.S. vital national interests require continued involvement in these operations for the near future. Common military and academic thinking of future challenges anticipates continued U.S. military involvement in irregular warfare missions in the first half of the twenty-first century.<sup>3</sup>

As revolutionary as both the Sputnik launch and 9/11 were, most people do not associate a link between these two paradigm-altering events separated by a mere generation. The commonly associated role of space power is as a strategic capability with global focus. Space capabilities would traditionally be a mismatch for extensive use in geographically limited, asymmetrical operations such as counterinsurgency, counter-terrorism, and nation-building. However, there is a role for space capabilities to play in these irregular operations.

The purpose of this thesis is to explore the use of U.S. space capabilities to enable successful nation-building operations. Space power should not be limited to large-scale

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2. President Barak Obama, Speech, “Remarks by the President in Address to the Nation on the Way Forward in Afghanistan and Pakistan,” December 1, 2009. <http://www.whitehouse.gov/the-press-office/remarks-president-address-nation-way-forward-afghanistan-and-pakistan> (accessed December 29, 2009).

3. U.S. Joint Forces Command. The Joint Operating Environment 2008. November 28, 2008 , 46.

conventional warfare operations; they can play a strong supporting role in both counterinsurgency and nation-building operations. Integration of space support to counterinsurgency matured during recent U.S. combat operations and now serves as a successful combat multiplier.<sup>4</sup> One cannot say the same for the nation-building operations currently underway in Iraq and Afghanistan. These missions gained in momentum as security increased and violence subsided, particularly in Iraq. This thesis asks whether the U.S. effectively integrates defense, civil (interagency), and commercial space capabilities as part of nation-building operations to strengthen the host government and society. It argues U.S. space capabilities supporting a geographic theater of war are postured to support kinetic operations, such as Major Combat Operations (MCO), not nation-building operations. The thesis of this study is recent experiences in Iraq and Afghanistan illustrate when combat operations transition to nation-building, employment of space capabilities must likewise adapt, else risk suboptimal space support to the mission.

Before proceeding further, it is essential to understand why this discourse matters. One could argue that space capabilities will not be decisive in any nation-building effort and therefore the attention paid in this paper is of little value. This notion is shortsighted and downplays the tremendous benefits space brings to the warfighter and civilian sector alike. Space is a critical economic and informational multiplier within the U.S. today. From drivers using Global Positioning System (GPS) to track their car's location to automated teller machines (ATM) transmitting bank data via satellite links, the average American citizen constantly utilizes space-enabled capabilities. This phenomenon is not

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<sup>4</sup> James M. Kowalski, "Joint Forces and Space: Applying Joint Force Attributes for Success," *High Frontier* 4, no. 2 (November 2008): 16.

limited to the U.S. but is now a common characteristic among industrialized Western societies including Europe and Japan. Military application mirrors this trend toward increased space utilization. Military leaders, academics, and the media all commonly regard the 1991 Persian Gulf War as the first space war. In essence, this was the first conflict that employed space in a tactical mindset for the prosecution of missile warning, GPS-aided location finding, and satellite communications.<sup>5</sup> Desert Storm, however, did not include nation-building operations. Nor was space a significant contributor to the Somalia, Haiti, and Bosnia nation-building efforts in the 1990s beyond the normalized space capabilities enhancing the military force's ability to conduct tactical operations. The largest U.S. led reconstruction nation-building missions following World War II were before the space age began in 1957. The current nation-building efforts in Iraq and Afghanistan are the first time space capabilities are available, and there is an appetite to employ these resources, to support the nation-building missions in progress.

Integrating space capabilities to enhance and support nation-building is a historic opportunity. Though space professionals across the globe work to integrate space capabilities into these current missions, the greater space community and joint planners have an opportunity to further adapt space capability application to the fundamentally distinct problems of nation-building. Lt Col James Oldenburg (then Major) analyzed the ability of space capabilities to adapt to counterinsurgency operations in his work *Fighting the War Above Iraq: Employing Space Forces to Defeat an Insurgency*.<sup>6</sup> This thesis is an evolution beyond Lt Col Oldenburg's work, and moves on to the unique, but ongoing,

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5. Charles A. Horner, "The Legacy of the First Space War," *High Frontier* 3, no. 4 (August 2007): 10.

6. James Oldenburg, "Fighting the War Above Iraq: Employing Space Forces to Defeat an Insurgency" (Master's thesis, Air Command and Staff College, 2007), 6.

task of nation-building. There can be no doubt enabling optimal space support to nation-building operations should be an immediate imperative within the U.S. Government. As nation-building increases and counterinsurgency related security operations decrease, the use of space capabilities to enhance nation-building efforts needs a corresponding increase. Leaving out U.S. space systems ignores an important arsenal of capabilities that enhances all of the elements of national power (diplomatic, informational, military, and economic) at use in these missions. Likewise, to continue to employ suboptimal integration of space capabilities fails to harness the existing capability of the U.S. defense, civil (including all relevant interagency departments), and commercial space sectors; ultimately, it marginalizes the U.S. Government's substantial investment in space capabilities.

This paper methodically reviews and analyzes the proposed thesis in four sections. Chapter one provides relevant background explaining why it is likely the U.S. will continue to execute nation-building operations. Chapter two presents how the U.S. integrates space power into recent military campaigns in Iraq and Afghanistan and reviews current space doctrine as it applies to nation-building. Chapter three provides the results of a root cause analysis on why the U.S. Government does not adequately integrate space capabilities into nation-building operations. Finally, chapter four offers a set of recommendations to enable the better integration of U.S. space capabilities into nation-building operations. The intended audience for this research is combatant command planners, Joint Task Force (JTF) staffs, and the U.S. interagency, military, and commercial space enterprise that create, organize, train, and provide these capabilities.

# CHAPTER 1

## NATION-BUILDING TOMORROW

Devising a consistent and all-encompassing military strategy for a state that spans its needs throughout time is an impossible task; there is no crystal ball to preview the future. Yet this is the challenge civilian and military leaders must wrestle with to determine the best employment of limited funds, personnel, and time. As Prussian military strategist Carl von Clausewitz stated in his epic treatise *On War*, chance is a key element of war.

It is now quite clear how greatly the objective nature of war makes it a matter of assessing probabilities. Only one more element is needed to make war a gamble – chance: the very last thing that war lacks. No other human activity is so continuously or universally bound up with chance. And through the element of chance, guesswork and luck come to play a great part in war.

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Expanded beyond the scope of a single conflict, Clausewitz' comments remain valid and reiterate the enormous complexity in establishing coherent national strategy. The calculated and deliberate use (or non-use) of all elements of national power to achieve desired political outcomes is the essence of strategy. The challenge for the U.S. Government today is to see through the fog of war and the elements of chance to establish a national strategy that will further U.S. vital interests.

The U.S. finds itself today involved in two resource consuming conflicts which have changed considerably since the conflicts began. The U.S. and its coalition partners continue post major conflict operations throughout Iraq. Meanwhile, President Obama recently approved a new strategy and re-emphasis on the Afghanistan mission to destroy

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1. Carl Von Clausewitz, *On War*, ed. Michael Howard and Peter Paret (New York: Everyman's Library, 1993), 96.

Al Qaeda terrorists and those providing them sanctuary, the Taliban.<sup>2</sup> Elements of both these missions are nation-building operations.

As stated in the introduction, this first chapter provides background needed to substantiate the thesis argument for revised planning and employment of U.S. defense, interagency, and commercial space capabilities in support of nation-building operations. It first explores the term nation-building and provides a baseline definition of the term. The discussion then turns to review the operational environment and offers context to understand the potential for U.S. involvement in nation-building operations throughout the twenty-first century.

### **Nation-Building Defined**

In the milieu of doctrine and reference publications, definitions are often blurred or used erroneously. The media, military planners, and academia use the terms counterinsurgency, counter-terrorism, and nation-building repeatedly in their discussions concerning current events. These missions are all essential elements of the current operations underway in Iraq, Afghanistan, and, on other limited scales, throughout the world. Authors employ these terms with impunity, assuming that the reader understands their nuanced use of these words. Searching U.S. Joint doctrine hardly clears up the matter and a reader seeking enlightenment may walk away confused. The basic summary of the range of joint operations spans five pages alone, offering 20 unique mission types.<sup>3</sup> Breaking down one of these types further, Joint doctrine lists the subsets of foreign assistance (FA) as foreign internal defense (FID), security assistance, humanitarian and

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2. President Barak Obama, Speech.

3. U.S. Department of Defense, Joint Publication 3-0: Joint Operations. [http://www.dtic.mil/doctrine/jel/new\\_pubs/jp3\\_0.pdf](http://www.dtic.mil/doctrine/jel/new_pubs/jp3_0.pdf) (accessed November 2, 2009), I-7.

civil assistance (HCA), antiterrorism, DOD support to counterdrug operations, show of force operations, and arms control.<sup>4</sup> Each of these mission sub-sets has further definitions and use in specific mission situations.

Ironically, Joint doctrine does not contain a formal definition for the term nation-building. Therefore, it is logical for the reader to wonder what is the definition of nation-building used in this thesis and why is this unofficial term used? For the purposes of this thesis, nation-building is defined as the collective use of U.S. (or coalition) government capabilities to execute stability, transition, and reconstruction operations. The purpose of nation-building is to enable the establishment of a legitimate democratic government in a host state. The U.S. defines success as the ability to promote an enduring transfer to democratic institutions.<sup>5</sup>

This definition was derived from *America's Role in Nation-Building: From Germany to Iraq* by Ambassador James Dobbins and his RAND teammates. Dobbins et al studied the nation-building phenomena for the U.S. government and identified seven significant nation-building operations the U.S. undertook since 1945.<sup>6</sup> These include the occupations of Germany and Japan, peacekeeping or peace enforcement missions in Somalia, Haiti, Bosnia, and Kosovo, and stabilization and reconstruction missions in Iraq and Afghanistan.<sup>7</sup> The terms used to define each mission follow the way the U.S. Administration in office at the time of the operation termed the effort. However, all of the aforementioned missions are examples of nation-building. Each of these missions

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4. U.S. Department of Defense, Joint Publication 3-0, I-9.

5. James Dobbins et al., *America's Role in Nation-Building from Germany to Iraq* (Santa Monica: RAND, 2003), 2.

6. Ibid.

7. Ibid, 1.

was unique. Levels of economic prosperity, existing civil control, familiarity with democratic ideals, population homogeneity, and security status varied in each case. It is little surprise the result of each operation was markedly different. However, the key element in each was the U.S. effort to enable a political transformation to democracy with economic transformation and security ensuing.<sup>8</sup>

This thesis uses the term nation-building because it most accurately identifies the employment of elements of national power to enable the transition of the host nation to democracy. The definition does not limit means to military forces. Nation-building is distinct from counterinsurgency and counter-terrorism because it focuses on strengthening the host nation's sovereign government, including the host government's ability to aid its people. Nation-building does not exclude force, but concentrates on non-violent methods to establish sustainable economic growth, an educated workforce, and improved health care. It specifically does not contain the essential element of establishing security, which is a precondition for nation-building and is provided through other means, such as an existing stable civil society or counterinsurgency operations.

U.S. Joint Doctrine commonly defines periods of a mission, or a campaign, into discernable pieces called phases. Milestones often separate these phases, acting as event decision points between one phase and the next. Ultimately, the commander or civilian leader overseeing the operation decides which phase of operations is underway. Nation-building, however, does not fit into this simplistic paradigm. Nation-building operations span multiple phases of a mission, initiating upon establishment of a safe and secure

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8. Dobbins, xix.

environment.<sup>9</sup> Nation-building is not constrained to post-combat phase four “stabilization” operations as commonly thought. In addition to not being constrained by traditional phasing, nation-building can occur across the range of military operations from low intensity (crisis response and limited contingency operations) to the high intensity (major operations and campaigns) efforts.<sup>10</sup>

### **Future Requirements for Nation-Building**

Nation-building is neither new nor a one-time phenomenon. The 9/11 terrorist attacks may have been the spark which led to the recent endeavors in Iraq and Afghanistan, but terrorism itself is not a direct cause of nation-building. Failed states or those without effective governments, whether removed by an outside power or from internal causes, are potential candidates for externally led nation-building operations. This is because nation-building is a means toward achieving political transformation, which, for the U.S., means a transition toward democracy.<sup>11</sup> All of the U.S. nation-building operations identified by Dobbins since 1945 meet this criterion.

### **Failed States in the Future**

Failed states are indirect threats to U.S. national security because they may unwittingly provide sanctuary for groups who seek to harm American interests. The traditional methods the U.S. might use to compel a state to address international threats within the state’s sovereign borders are not realistic options to engage failed states. This

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9. Hans Binnendijk and Stuart E. Johnson, *Transforming for Stabilization and Reconstruction Operations* (Washington, D.C.: National Defense University Press, 2004), 9.

10. U.S. Department of Defense, Joint Publication 3-0, I-8.

11. Dobbins, xix.

is because the current international order assumes functioning states that seek acceptance within the international community, and states that hold each other accountable within this framework. If a vital U.S. national interest is threatened by the lack of security, and the U.S. government is willing to devote the fiscal, manpower, and political resources required, then the U.S. may undertake future nation-building operations to lead the state toward productive membership in the international security order.

According to Dr. Robert Rotberg of Harvard University, there is a multitude of causes of state failure including a state's geographical, physical, historical, and political circumstances.<sup>12</sup> These causes include resource deprivation, lasting poverty, and landlocked or non-arable land. These traits are unique to every state and require study to understand their impact and interrelations with other traits. As a state descends from functioning to failed, there are identifiable characteristics that serve as an omen.

Several revealing signposts mark the road to state failure. On the economic side, living standards deteriorate rapidly as elites deliver financial rewards only to favored families, clans, or small groups. Foreign-exchange shortages provoke food and fuel scarcities, and curtail government spending on essential services and political goods; accordingly, citizens see their medical, educational, and logistical entitlements melt away. Corruption flourishes as ruling cadres systematically skim the few resources available and stash their ill-gotten gains in hard-to-trace foreign bank accounts.<sup>13</sup>

As the state provides fewer services, the people begin to call the legitimacy of the government into question. Leaders often turn from embracing democratic ideals and begin self-preservation of their regime. The ruling elite of these nations become

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12. Robert I. Rotberg, "Failed States in a World of Terror," *Foreign Affairs* 81, no. 4 (2002): EBSCOhost (accessed November 8, 2009).

13. Ibid.

wealthier as the population's quality of life degrades.<sup>14</sup> There is an expectation that functioning states provide basic medical care, education, social services, regulation of energy and water resources, and environmental protection. A citizen of a state that lacks these basic services sees its government as typically failing to meet society's needs. These characteristics can be measured, but are not the cause of state failure in and of themselves; they are merely symptoms of the causes of state failure.

State failure is a concern of the international community because the international community expects a state to provide governance of its people within its borders. This is a fundamental basis of the Westphalian system where each nation-state is a sovereign organization afforded certain rights among states. States expect each other to provide security and stop crime, anarchy, and lawlessness from passing its border.<sup>15</sup> Failed states are not only unable to provide basic security to its citizens; they are unable to prevent disorder and lawlessness originating from within its borders from affecting other states. This is the prime reason why the U.S. response to the 9/11 terrorist attacks focused not only on the perpetrators of the attack, Al Qaeda, but also on the Afghanistan government, led by the Taliban, who allowed terrorist activity to permeate its borders.

Identifying states with certainty that will or will not fail is an impossible task. Using Rotberg's distinguishable traits to survey demographics and trends in globalization, however, general themes emerge. The U.S. Joint Forces Command (USJFCOM) Joint Operational Environment (JOE), published in 2008, summarizes demographic, energy, food, economic, water scarcity issues over through approximately

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14. Rotberg.

15. Ibid.

2030. Demographic trends through 2030 show the world's population increasing by approximately 60 million people annually, with 95% of this growth in developing states.<sup>16</sup> Based on estimates, the total world population will reach over 8 billion by 2030.<sup>17</sup> In Sub-Saharan Africa and the Middle East, a youth bulge will grow; the population under 30 years of age will grossly outnumber the population above 30 years.<sup>18</sup>

In addition to demographic trends, scarcity surrounding energy resources, food, and water will bring states in contact with other ethnic and religious groups. China's increased need for energy, for instance, is driving them on a strategy to extract resources from foreign states, particularly oil and coal in Middle Eastern and African states.<sup>19</sup> Internal peoples are, in some cases, relocating to fill population voids, such as Chinese moving into Siberia. Other migrations are due to economic necessity and the chance for opportunity in another state. Globalization is connecting states and peoples from all parts of the world together in new ways, creating opportunities for growth, but in some cases, also fueling competition and ethnic strife.<sup>20</sup> Trends for failed states will likely continue, but there will undoubtedly be states that surprise the international community with their success, and there will be states that rapidly collapse with little warning.<sup>21</sup>

## **U.S. Strategy and Nation-Building**

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16. U.S. Joint Forces Command, 10.

17. Ibid.

18. Barnett, 163.

19. United Kingdom Ministry of Defence, "The DCDC Global Trends Strategic Programme 2007-2036," (January 2007): 32.

20. Ibid, 3.

21. U.S. Joint Forces Command, 35.

After looking at the causes of and outlook for failed states, which provide potential situations for the U.S. to engage in nation-building, this thesis now turns to review the stated inclination of the U.S. to engage in such operations in the future. This section reviews the current formal strategic guidance for the U.S. and its primary departments conducting nation-building operations, and recent policy statements by key members of the Obama Administration, such as Secretary of Defense Robert Gates.

The National Security Strategy (NSS) of the U.S. supports the use of nation-building to further its vital interests. Though written in 2006 under the Bush Administration, the NSS continues to guide security decisions and planning, amended by speeches and policy statements from the Obama Administration. The NSS identifies nine essential tasks for the U.S. to government, laying out upfront the view of the Administration on how best to keep the U.S. secure.

Championing freedom advances our interests because the survival of liberty at home increasingly depends on the success of liberty abroad. Governments that honor their citizen's dignity and desire for freedom tend to uphold responsible conduct toward other nations, while governments that brutalize their people also threaten to peace and stability of other nations. Because democracies are the most responsible members of the international system, promoting democracy is the most effective long-term measure for strengthening international stability; reducing regional conflicts; countering terrorism and terror-supporting extremism; and extending peace and prosperity.<sup>22</sup>

There are key elements of U.S. strategy identified in this paragraph. First, it states unequivocally the U.S. sees the spread and growth of democracy to other nations as the primary means to maintain national security and peace in the international arena. This translates the spread and upholding democracy as a vital national interest. Second, it promulgates the perceived requirement for the rest of the world's sovereign states to

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22. President George W. Bush, National Security Strategy 2006. <http://georgewbush-whitehouse.archives.gov/nsc/nss/2006/nss2006.pdf> (accessed December 27, 2009): 3.

“honor their citizen’s dignity and desire for freedom.” This lays a challenge for other states to meet and implies the U.S. may assist states in efforts to meet that challenge. Finally, the statement calls out terror-supporting extremism as an ill that must be resolved. This implies that the U.S. may choose to intervene with governments and non-state actors who provide sanctuary or support for terrorists seeking to harm U.S. interests.

With intent to support and encourage democracy as a clear priority, the NSS turns to identify the ways the U.S. will actualize this vision on a regional level. The three methods are conflict prevention and resolution, conflict intervention, and post-conflict stabilization and reconstruction.<sup>23</sup> It is pertinent to note the specific calling out of stabilization and reconstruction. As defined previously, this is official acknowledgment of U.S. policy to perform nation-building operations as required. The NSS goes on to state that the early establishment of strong local institutions such as an effective police force and functioning justice system are essential.<sup>24</sup> Though security is essential to conduct any nation-building effort, the U.S. Administration clearly sees a role for nation-building as an effective means to correct failed or failing states and steer them toward a path of stability and accountability within the international system.

Following the NSS lead, the primary strategy document for the Department of Defense (DoD) also supports nation-building operations when required. The National Defense Strategy (NDS) states,

Iraq and Afghanistan remind us that military success alone is insufficient to achieve victory. We must not forget our hard-learned lessons or allow the important soft power capabilities developed because of them to atrophy or even disappear. Beyond security, essential ingredients of long-term success include economic development, institution building, and the rule of law, as well as

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23. President George W. Bush, National Security Strategy, 15.

24. Ibid, 16.

promoting internal reconciliation, good governance, providing basic services to the people, training and equipping indigenous military and police forces, strategic communications. We as a nation must strengthen not only our military capabilities, but also invigorate other important elements of national power and develop the capability to integrate, tailor, and apply these tools as needed.<sup>25</sup>

The U.S. defense establishment has taken on the long-term tasks of reconstruction, development, and setting the framework for self-governance in Iraq and Afghanistan. As security is established, nation-building operations are essential before U.S. forces can depart. In essence, the NDS acknowledges that nation-building is as fundamental to achieve the greater national security objectives over the next decade.

The Department of State (DoS) 2007-2012 Strategic Plan mirrors the support for nation-building stated in the NDS and in public speeches. DoS, in partnership with DoD, intends to develop U.S. Government capacity to conduct effective stabilization and reconstruction operations.<sup>26</sup> DoS requires DoD to provide security essential for the provision of assistance and looks for contributions from other U.S. Government agencies. In addition, DoS seeks contributions from the Department of Homeland Security and the Department of Health and Human Services to coordinate effective nation-building operations.<sup>27</sup>

After reviewing U.S. national-level strategy, it is clear the U.S. Government not only acknowledges nation-building as a possible means to achieve a desired end, but is preparing capability should it need to employ it further. The Executive Branch has

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25. U.S. Department of Defense, National Defense Strategy 2008. <http://www.defense.gov/news/2008%20National%20Defense%20Strategy.pdf> (accessed December 27, 2009), 17.

26. U.S. Department of State, Strategic Plan: Fiscal Years 2007-2012. <http://www.state.gov/documents/organization/82819.pdf> (accessed December 27, 2009), 14.

27. *Ibid*, 33.

spread nation-building capability throughout the U.S. Government making any effort a multi-agency mission by default.

The preceding discussion outlined a situation where failed states often, wittingly or unwittingly, condone an environment where threats to U.S. national security are able to grow and ultimately emanate. The U.S. Government realizes it cannot solve these recurrent threats permanently by one-time direct action. Someone, such as the U.S. Government, another state, or the host nation itself, needs to act to remedy the root cause of the problem and remove the threat. The U.S. is committed to using its three-prong approach to enabling its security; development, diplomacy, and defense are the cornerstones of U.S. national security strategy.<sup>28</sup> The U.S. currently is building increased capacity to conduct nation-building missions by employing the full-range of U.S. Government capabilities.

If history is an indication of the future, regardless of which major U.S. party holds the Presidency, the U.S. will remain an active exporter of its national capabilities in an effort to achieve its national security objectives. Nation-building is but one type of effort the U.S. can lead. With seven major efforts in the last 60 years, a growing budget within the DoS, and nation-building specialization underway in the DoD, nation-building operation will likely be a staple of the U.S. development, diplomacy, and defense endeavors far into the twenty-first century.

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28. Hillary Clinton, Testimony before the Senate Appropriations Committee on April 30, 2009. <http://appropriations.senate.gov/ht-full.cfm?method=hearings.download&id=54952535-0e35-44aa-8d0c-cc256c7a15ec> (accessed on March 10, 2010).

## **CHAPTER 2**

### **SPACE IN THE TWENTY-FIRST CENTURY**

Most American citizens have cursory knowledge of the services provided through space that affect their lives on a daily basis. They picture satellites passing data and voice communications across oceans, or the Hubble Space Telescope imaging distant galaxies for scientific purposes. Yet, for the most part, they are unaware of the billions of times daily American citizens utilize space technologies. American's use space capabilities when they swipe their credit card at the pump to fill their car with gasoline. The pump relays the credit card information via a Very Small Aperture Terminal (VSAT) link with a satellite which then downlinks to their credit institution and receives a reply in a split second. Americans are equally unaware that their cell phone identifies the local 911 emergency system based on information provided by the GPS constellation and computed by the phone itself. Space has become so ingrained in American society that its benefit is often unacknowledged.

American thinking about how space capabilities support military operations follows the same line of thought just mentioned. Soldiers, sailors, marines, and airmen are typically uninformed of the effects provided by and through space. This speaks nothing of the massive growth in space capabilities since the Cold War and the dependence the U.S. military has on space today. The explosion of space provided capabilities established a foundation to our information technology backbone and

situational awareness dominance. The pace has only increased since the Persian Gulf War, which historians deemed the “first space war.”<sup>1</sup>

This chapter provides a brief review of space support to military contingencies beginning with the Persian Gulf War in 1991 and continues through the current missions that started after the September 11, 2001 terrorist attacks. It provides the reader an understanding of how space capabilities fit into theater-level operations. Then this chapter reviews the codified doctrine currently in place concerning space support to nation-building. Following these reviews, the reader will be ready to engage the problem this thesis sets out to address.

### **Space Support to Theater Contingencies**

Space support to military operations has evolved tremendously since Sputnik in 1957. Born in the height of the Cold War, the purpose for the first generation of space systems was to provide capabilities in order to exploit the Soviet Union and enable nuclear deterrence.<sup>2</sup> Efforts to prevent and, should war emerge, prevail over the Soviet Union provided the initial requirement for U.S. space capabilities and the baseline for their integration into military operations. These space capabilities focused on strategic reconnaissance, radiation hardened low data rate communications, and unambiguous ballistic missile warning.<sup>3</sup> General Horner, former Combined Forces Air Component Commander (CFACC) during the Persian Gulf War and subsequently commander of U.S. Space Command (USSPACECOM), recalls that the military services could not have

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1. Larry D. James, “Bringing Space to the Fight: The Senior Space Officer in Operation IRAQI FREEDOM,” *High Frontier* 1, no. 4 (2006): 16.

2. Horner, 10.

3. *Ibid.*

integrated space capabilities of that time into theater contingencies. Commanders reserved space capabilities for the most extreme forms of war, or intentionally chose not to employ to prevent disclosure of highly sensitive classified capabilities.<sup>4</sup> The result was the greater military establishment largely ignored space capabilities in theater-level missions from inception of the space age throughout the 1980s. Vietnam, Grenada, and Panama were all largely without any space support beyond early satellite communications and limited reconnaissance. Within the U.S. space community, a culture of exclusion and secrecy pervaded which kept space systems distinctly separate from other conventional warfighting capabilities.

These paradigms that held space capabilities as a strategic reserve for World War III persisted until three significant events took place in the 1980s that shifted the ability of theater commanders to obtain space support. First, the Goldwater-Nichols Act not only reorganized the DoD, it created a unified combatant command for space, USSPACECOM.<sup>5</sup> The act also put responsibility for space capability requirements in the hands of the respective geographic commander-in-chief (CINC), or in current parlance, Combatant Commander (CCDR). These commanders now had a voice to ask for the space capabilities they needed to meet specific mission requirements within their Area of Responsibility (AOR). Service Chiefs, who traditionally controlled the budget, integration, and employment of space capabilities within their own service channels, were now compelled to provide these forces to the geographic CCDR. Second, the end of the Cold War removed the primary rationale for maintaining a vast array of space

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4. Horner, 10.

5. Ibid.

capabilities focused solely on potential war with the Soviet Union.<sup>6</sup> Once risk of conflict diminished, the DoD and other national agencies had to address the enormous costs to procure, operate, and maintain these high-tech systems. Their choices were to eliminate capabilities or re-vector existing and developmental space capabilities to support the most likely future contingencies, especially those in support of theater-level operations.<sup>7</sup> The Persian Gulf War sped the transition of space capabilities focus from the strategic-level to the operational-level. The third pivotal force to change the U.S. military's attitude toward space capabilities was the growing demand for space-based capabilities, services, and products worldwide.<sup>8</sup> As the commercial and civil arena embraced and sought space capabilities, demand for military space applications likewise increased. Military commanders (CCDR and respective service chiefs) pushed space capabilities from niche capabilities into core enablers for military operations.

As previously mentioned, the 1991 Persian Gulf War was a watershed event for space capabilities integration into theater combat operations. For the first time, once-strategic space capabilities were in support of a regional CCDR. The integrated employment of space capabilities with combat forces created previously unrealized synergies between strategic assets and tactical combat power. GPS became a pre-eminent combat tool providing not only accurate position, but also enabling precision bombardment.<sup>9</sup> Satellite communications allowed mobile forces to stay in contact with their headquarters allowing coordinated action toward operational objectives. As

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6. Horner, 10.

7. Ibid.

8. Ibid.

9. James, 15.

Saddam Hussein used short-range SCUD ballistic missiles against forces in Saudi Arabia and in an effort to terrorize Israeli civilians, the U.S. military rapidly adapted space-based missile warning sensors used to detect Cold War missile launches into a system to prevent tactical warning to forward based forces.<sup>10</sup> As the U.S. military and its allies came to embrace space as an effective tool of war, they also acknowledged and made efforts to prevent Iraq from using space capabilities for their own. The U.S. conducted successful offensive space control missions by destroying Iraqi satellite ground stations via GPS-aided precision strikes.<sup>11</sup> By the end of the conflict, the paradigm of strategic space, which ruled since Sputnik, faded under the reality that space capabilities are equally important to enhance combat at the operational and tactical levels.

This view of space capabilities by the U.S. military pervaded the 1990s with little change until following the completion of Iraq major combat operations in 2003. As the mission ebbed with the rise of insurgent factions, punctuated by operations such as those on Fallujah, space planners found niche uses for space capabilities to enhance particular combat mission sets. Examples include the use of GPS predictions to improve the accuracy of Guided Multiple Launch Rocket System (GMLRS), thus reducing potential collateral damage, and overhead non-imaging infrared (ONIR) systems to potentially detect the infrared signature from a detonated improvised explosive device (IED).<sup>12</sup> Growth of space use supporting combat spread to Afghanistan where International Security Assistance Forces (ISAF), particularly from the U.S. division in Regional

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10. James, 15.

11. Horner, 11.

12. Gary L. North and John Riordan, "The Role of Space in Military Operations: Integrating and Synchronizing Space in Today's fight," *High Frontier* 4, no. 2 (February 2008): 5.

Command East, embraced these new techniques. For example, space systems were used to create a weather mosaic to provide enhanced indications of weather on-the-surface in particularly remote regions of Afghanistan in support of special operations forces.<sup>13</sup> In addition to the above mentioned capabilities, planners found uses for space systems to enhance additional long range munitions (both air and ground launched), rapid imagery collection using commercial systems, long-range unmanned aerial system (UAS) employment, and blue force tracking (BFT) to monitor locations of known coalition forces.<sup>14</sup> Creative application of existing systems, largely strategic in original purpose, allowed great success in integrating space systems into theater combat operations.

In summary, planners in Iraq and Afghanistan successfully evolved space capabilities to meet the demands of their current mission challenges. The effects brought about by space systems transformed the way operational commander's think about space systems; they must have them to execute operations at the highest levels of effectiveness and efficiency in combat. The tactics, techniques, and procedures used since the onset of these contingencies established an era of unprecedented space integration in support of combat-oriented missions. These experiences enabled, and then advanced further U.S. military doctrine concerning space systems. The following section identifies the elements of doctrine that underlie the use of space capabilities in theater-level operations.

### **Doctrine for Space Support to Nation-Building**

Doctrine enabled these successes by providing foundational guidance and sufficient flexibility to meet the evolving mission requirements. Joint Publication (JP) 3-

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13. North, 4.

14. North, 6.

14, *Space Operations*, revised in 2009, echoes the experiences proven in the Middle East by stating, “Space operations ensure JFCs have the ability, flexibility, and freedom of action to take advantage of the capabilities provided by space systems.”<sup>15</sup> The publication goes on to state that space capabilities are critical enablers to increase force effectiveness, particularly by providing five force enhancement functions: intelligence, surveillance, and reconnaissance (ISR); missile warning; environmental monitoring; satellite communications; and space-based positioning, navigation, and timing.<sup>16</sup> The guidance found therein provides the backbone of U.S. application of space capabilities in contingency operations. Doctrine states upfront that these capabilities are for use in today’s missions, regardless of level of intensity, the number of forces involved, or the services involved. Of particular note is the emphasis the Chairman and Joint Staff place in current doctrine on space capabilities supporting the geographic CCDR and his subordinate JTF Commander(s). This underlies the ability for dispersed forces to harness the collective national space capabilities, particularly those under U.S. Strategic Command (USSTRATCOM) (which absorbed USSPACECOM) and the Intelligence Community (IC) to execute the designated mission.

At the operational level, the services (particularly the Army and the Air Force) expanded this overarching guidance to discuss the application of their organic space capabilities and personnel. Army Field Manual (FM) 3-14, *Space Support to Army Operations*, published in 2005, provides the framework which underlies JTF commander use of space capabilities in both Iraq and Afghanistan. It marries with the Joint and Air Force Doctrine to enable functioning command and control (C2), as well as a

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15. U.S. Department of Defense, Joint Publication 3-14 Space Operations. 6 January 2009, ix.

16. Ibid, x.

coordinating relationship, for the integration of space capabilities. Chapter three of FM 3-14, in particular, provides detailed discussion on the space capabilities ground forces may employ in support of their designated mission. FM 3-14 identifies space contributions to offensive and defense operations as satellite communications (SATCOM), position, velocity, and timing (traditionally known as position, navigation and timing, or PNT), environmental monitoring, space ISR, theater missile warning, and space control.<sup>17</sup> Of note, these differ from the Joint doctrine by emphasizing elements of space capabilities relevant to ground forces, such as theater missile warning vice missile warning in general. FM 3-14 further delineates a difference in space contributions to “offensive and defensive operations” and “stability and support operations”. This emphasizes differing contingency requirements due to mission, operational scope, or variations from mission phasing.<sup>18</sup> Though the mission sets offered are the same as offensive and defensive operations, Army doctrine is nuanced to discuss different uses for theater missile warning, space control, and environmental monitoring, to name a few, where there are direct applications to build host nation capacity and ultimately government legitimacy.

Air Force Doctrine Document (AFDD) 2-2, *Space Operations*, last updated in 2006, provides the Air Force’s view on space capabilities and their employment. This works in unison with the Joint and Army doctrine as it provides the common C2 framework employed today for space forces. AFDD 2-2 presents the Air Force’s use of a Director of Space Forces (DIRSPACEFOR), under the Geographic Combatant Command

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17. Department of the Army, Field Manual 3-14: Space Support to Army Operations, May 2005, 3-2.

18. Ibid, 3-1.

(GCC)'s air component. The DIRSPACEFOR is the means through which the Combined Forces Air Component Commander (CFACC) plans, executes, and assesses space operations when the GCC Commander delegates Space Coordinating Authority (SCA) to the CFACC.<sup>19</sup> Though JP 3-14 does not show preference, established precedent is that the GCC Commander typically delegates SCA to the Air Component.<sup>20</sup> This thesis will not argue for or against the merit of this common assignment. However, it is important to acknowledge that JP 3-14, FM 3-14, and AFDD 2-2 work in unison to create the common framework employed today. They provide the expectation for effective and efficient use of space capabilities to enhance operations across the spectrum of conflict while establishing a means to unity of effort. It is from this foundation that space operations within Iraq and Afghanistan execute. Contingency plans in other GCC also use this framework to enable the C2, planning, and execution of space capabilities. U.S. space doctrine has grown tremendously since 1991, and it continues to evolve as space capabilities expand into additional mission sets.

Having reviewed the increased emphasis and use of space capabilities from Sputnik to today, this thesis now turns to looking at an ongoing problem hindering the optimal employment of space capabilities today. The following section identifies the problem, and ends with an identification of root causes. This discussion is an important part of the ongoing evolution of space doctrine as nation-building becomes a common mission requiring space enhancement in the twenty-first century.

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19. Department of the Air Force, Air Force Doctrine Document 2-2: Space Operations, November 27, 2006, 16.

20. Ibid, 13.

## **CHAPTER 3**

### **ROOT CAUSE ANALYSIS**

Space capabilities play an ever-increasing role in the way the U.S. and its allies execute contingency operations across the spectrum of conflict. Short of an intentional act to limit use of space systems, reliance upon and use of these capabilities in contingency missions will continue and grow in the twenty-first century. This thesis presented reasons why the U.S. will continue military operations outside its borders in chapter one, particularly nation-building operations. Nation-building is not a short-lived activity, but an essential means of achieving U.S. National Security Strategy objectives. These operations will continue to be commonplace in the near future. In chapter two, this thesis summarized the evolution of U.S. space capabilities from strategic assets to critical enablers of today's military missions including low-intensity conflict and non-combat contingency operations. The U.S. government has a multitude of space capabilities resident within the DoD and other federal agencies that can enhance nation-building operations. The military services also have doctrine to provide an adaptable framework for the employment of U.S. space capabilities in support of a multitude of situations.

If the integration of space systems into U.S. led operations is a given, the question then becomes one of appropriate application of those limited resources. For the purpose of this thesis, the definition of appropriate application is the synchronization and optimization of available space capabilities. At a macro level, synchronization implies employment of all of the available the means in unison to create a synergistic effect where the result is often times greater than the individual inputs. Likewise, optimization calls for thoroughly employing space capabilities with efficiency, precision, and

completeness. Therefore, this study addresses whether the U.S. effectively integrates defense, civil, and commercial space capabilities as part of nation-building operations to strengthen the host government or society. Is the U.S. employing space capabilities in a synchronized manner in support of the elements of today's Afghanistan and Iraq operations that are essentially nation-building? Have commanders optimized the employment of space capabilities in these missions? This thesis asserts the answer to these questions is, "No, the U.S. does not optimally integrate space capabilities in support of ongoing nation-building efforts." This chapter states the problem, expounds on the primary causal factor, and identifies the linked root causes. Following root cause identification, chapter four provides recommendations for mitigation.

### **Framing the Problem**

Since 2001, space professionals within U.S. Central Command (USCENTCOM) and U.S. Strategic Command (USSTRATCOM) significantly improved the integration of space capabilities into kinetic combat operations in Iraq and Afghanistan. GPS enhancements to small diameter bomb (GBU-39) and the Ground Launch Mobile Rocket System (GLMRS) increased precision and lethality, while simultaneously minimizing collateral damage.<sup>1</sup> Satellite communications (SATCOM) enabled pilots operating within the U.S. to deliver precision Hellfire missiles on a target in the Middle East.<sup>2</sup> U.S. space capabilities detected infrared signatures from detonations on the ground, and intelligence analysts spent much time attempting to correlate explosions with improvised

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1. John W. Raymond, "People Who Impact Warfare with Space Capabilities," *High Frontier* 4, no. 2 (February 2008): 26.

2. North, 6.

explosive devices (IED).<sup>3</sup> All of these significant advances support kinetic forms of warfare. The priority of effort for space systems supporting theater contingencies has been on the counter-insurgency missions in both Iraq and Afghanistan. However, to say the space community's emphasis is on the high visibility theater-level operations in Iraq and Afghanistan is incorrect. Support to geographic theaters is a low priority for a space community grappling with global responsibilities and future challenges. In none of the prepared speeches during 2009 by Gen Chilton, Commander of USSTRATCOM, does he speak about space support to nation-building endeavors, including his posture statements to the Senate and House Armed Services Committees. USSTRATCOM's space priorities are reconstituting aging satellite infrastructure, increasing space situational awareness issues, and preserving the nation's space industrial base.<sup>4</sup> At the same time, Geographic CDR and their subordinate JFC Commanders are not engaging USSTRATCOM adequately to create increased requirements for space capabilities to support nation-building within their Area of Operations (AO). Within USCENTCOM, the commander whom holds Space Coordinating Authority (SCA) is the Combined Forces Air Component Commander (CFACC).<sup>5</sup> The CFACC acts as an intermediary between the GCC's JFC Commanders and USSTRATCOM for their respective mission. Though intended to streamline space support, this creates an impediment toward achieving unified effort between the JFC and USSTRATCOM. With the low priority given to regional nation-building efforts by USSTRATCOM, and the lack of consideration give to

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3. Ibid, 4.

4. Kevin P. Chilton, Testimony before the House Armed Services Committee on March 17, 2009. <http://www.stratcom.mil/posture/> (accessed on December 29, 2009).

5. John E. Hyten, "Fighting and Winning with Space," *High Frontier* 4, no. 2 (February 2008): 13.

integrating space capabilities into JTF planning, there is little direction, priority, and resulting action for the creative employment of space capabilities in support of theater-level nation-building missions.

Lack of space support to theater nation-building emerged not by the mistaken action of any commander or group. Nor did it originate with a single event or catastrophic failure. This problem emerged from the gradual evolution of the Iraq and Afghanistan missions and the divergence of priorities for the U.S. space enterprise and deployed JTFs. As more-kinetic combat operations transitioned into missions focused on non-kinetic means, the rift became visible. As of this writing, the U.S. presence in Iraq has begun a gradual reduction as incidents of violence against U.S., coalition, and Iraqi security forces decrease.<sup>6</sup> In 2009, emphasis within USCENTCOM transitioned toward rejuvenating the Afghanistan mission in light of setbacks with the Afghanistan Government and resurgence of Taliban activity and strength.<sup>7</sup> In both cases, nation-building operations are running simultaneously with kinetic-oriented security operations and capture-kill missions by counter-terrorism forces. Commanders in both Iraq and Afghanistan came to understand the value space capabilities bring for their missions, however the focus was applied toward enabling critical combat engagements. As combat engagements decreased and the missions shifted toward a greater focus on nation-building, the use and integration of space capabilities did not correspondingly shift. These space capabilities remained tied toward supporting the force-on-force combat operations they successfully enabled on the battlefield.

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6. David Petraeus, Speech, "State of the CENTCOM Area of Responsibility: A Strategic Assessment," Colin Cramphorn Memorial Lecture, September 17, 2009.

7. Ibid.

Before discussing the primary causal factor, a definition is in order. According to Rooney, “Causal factors are those contributors (human errors and component failures) that, if eliminated, would have either prevented the occurrence or reduced its severity.”<sup>8</sup> As this review is not of a specific event, causal factors are extended to look at contributors to the system, which, if changed, could reduce the inefficiency in space support to nation-building. Analysis reveals that the heart of the issue narrows to where responsibility lies for space support to each respective theater mission. This falls upon the respective JFC Commander. The role of these individuals makes this link the crucial element in determining the success of space support to nation-building operations. In the following paragraphs, this thesis discusses why this crucial link in the system leads to five distinct root causes of the problem.

The JFC Commander is the overall leader for operations within his or her AO. There are several instances where supporting commanders provide capabilities, but they do so largely in support of the JFC Commander. Space capabilities are one of these supporting efforts. The JFC Commander has a stake in ensuring the integration of space capabilities into the mission. In both the current efforts in Iraq and Afghanistan, the USCENTCOM Commander, GEN Petraeus, delegated Space Coordinating Authority (SCA) to the Combined Forces Air Component Commander (CFACC). Due to an unusual command structure within USCENTCOM, the CFACC does not fall under either the Iraq nor Afghanistan JTF Commander, but rather reports directly to the CCDR. Each respective JTF Commander and the CFACC have a mutual responsibility to ensure the

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8. James J. Rooney and Lee N. Vanden Heuvel, “Root Cause Analysis for Beginners,” *Quality Progress* 37, no. 7 (July 2004): 45-53.

integration of space capabilities into the mission.<sup>9</sup> This puts a unique burden on the JFC Commander. The commander has the responsibility to ensure the synchronization and effective employment of all elements of national power to achieve successfully the desired end-state. Whether or not the JFC Commander has any power to influence space capabilities, the task falls upon him to ensure space integration. The JTF Commander must work through the holder of SCA (the CFACC) to coordinate with USSTRATCOM for the employment of space capabilities. There is no means around the JTF Commander as a conduit for the integration of space capabilities into their respective AO and corresponding mission.

Complicating this matter is that nation-building is seen by the DoD as a mission set outside its own core competencies. The DoD focus until recently has been on preparing for conventional conflict stemming from the Cold War requirement to stop the Soviet Union from entering Western Europe or defeating a conventional North Korea as they pushed south. The DoD is grappling with the recent emphasis for irregular warfare (IW), including nation-building capacity, as highlighted in the 2010 Quadrennial Defense Review (QDR).<sup>10</sup> Secretary Gates has been vocal about the need to boost the capacity of the DoS and other federal agencies. His speeches urged Congress to fund and authorize manpower to perform the requisite parts of this critical mission set for the promulgation of U.S. national security.<sup>11</sup> However, this recent emphasis does not change the reality that DoD is the lead executor of nation-building operations. The respective JTF

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9. Michael Carey, "Integrating Space Capabilities in Support of the USCENTCOM Theater of War a Challenge for the DIRSPACEFOR," *High Frontier* 1, no.4 (2006): 18.

10. Department of Defense, "Quadrennial Defense Review 2010," (February 2010): 20.

11. Robert M. Gates, Speech, "U.S. Defense Secretary Gates Warns Against Militarization of Foreign Policy," U.S. Global Leadership Campaign (July 15, 2008). <http://www.africom.mil/getArticle.asp?art=1915> (accessed on November 12, 2009).

Commander in Iraq and Afghanistan had the lead in ensuring accomplishment of the nation-building element of the overall mission. The U.S. Government interagency was under resourced and undermanned to perform nation-building. Though there are positive signs of improvement on this front, nation-building is clearly the responsibility of the JFC Commander at this time.

Therefore, the role and responsibilities of the JFC Commander and his staff are the causal factor in the sub-optimal integration of space capabilities into nation-building efforts. Removing, or changing, this paradigm would alter the relationship between the problem and the root cause. From this causal factor derives a series of root causes that coalesce to enable the problem to emerge, grow, and fail at self-correction. The question becomes why the JFC Commander is unable to ensure the optimal integration of space capabilities. This leads to five root causes that the following section discusses.

### **Root Cause Identification**

As stated previously, a root cause is an underlying cause from which all outcomes of the process depend.<sup>12</sup> Suboptimal employment of space capabilities runs through the JFC Commander and the command arrangement, which puts the commander in charge of all elements of the mission in the AO, including nation-building operations. The JFC Commander is the nexus that directs employment of forces in a synchronized and effective manner, with an eye toward efficiency. Using a modified form of RCA's mapping technique to deduce root causes, there are five root causes that create the conditions present regarding suboptimal employment of space capabilities in the current nation-building endeavors. Published reports of space contributions to the missions in

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12. Rooney, 46.

Iraq and Afghanistan and the author's personal observations while directly supporting both missions from 2006-2009 were the primary sources used to formulate this review. These root causes are inadequate education, planning staff limitations, lack of civil and commercial space lead, USSTRATCOM's minimal engagement in theater missions, and lacking Provincial Reconstruction Team (PRT) space awareness. The following subsections discuss each of these root causes and explains how they lead to inefficient employment of space capabilities in Iraq and Afghanistan, and without change, how these would lead to future sub-optimization in future nation-building endeavors.

### **Inadequate Education**

Space education continues to hinder integration of space capabilities into mission planning and execution. The position of JFC Commander itself is one of the most complex jobs in the world. He must be all things to all people from military commander, to diplomat, to local governor for the host nation's citizens. The requirement for situational awareness and insight into the status of operations is formidable. In the midst executing daily operations, the JFC Commander is rightfully not thinking about the myriad of space capabilities available and how they could be morphed to meet his unique needs with multiple ongoing lines of operation.<sup>13</sup> At one moment, the JFC Commander focuses on the kinetic combat missions to rout insurgents and provide security, while at the same time he is following the reconstruction of schools and status of local power distribution. The JFC Commander is therefore married to his joint planning team.

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13. Carey, 18.

Military space education for most of its officers is an afterthought.<sup>14</sup> Specific space training programs expanded greatly in the Air Force and Army after the 2001 Space Report to improve the technical expertise of its core space personnel. The USAF gave Air Force Space Command (AFSPC) lead and the means to grow a cadre of space professionals under its Space Professional Development office.<sup>15</sup> The National Security Space Institute (NSSI) emerged out of this program. The school offers initial, mid-career, and senior-career space awareness training. Courses eventually expanded to cover not only USAF space operations personnel, but also those military personnel involved in acquisition of space systems, and space operators from other services. The U.S. Army embraced the need for advanced training of its growing space personnel and now sends all of its newly selected mid-grade Functional Area 40s (FA40) through the 11-week Army Space Operations Officer Qualification Course.<sup>16</sup> However, outside this improved training for designated space personnel, there is little space training for aspiring service leaders. The 2001 Space Commission Report stated:

Despite the increased attention given to space within the military education system, the core curriculum does not stress, at the appropriate levels, the tactical, operational or strategic application of space systems to combat operations. Military commanders and their staffs continue to rely on “space support teams” assigned to them in time of crisis to advise on the use of space capabilities. Commanders would be better able to exploit the full range of combat capability at their disposal if they were educated from the beginning of their careers in the application of space systems.<sup>17</sup>

Limited improvements since the release of the 2001 report are visible such as space-centric electives at the Army Command and General Staff College. Advanced planning

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14. Commission to Assess U.S. National Security Space Management and Organization, Report, (January 11, 2001): 47.

15. Lance W. Lord, “Space Support to the Warfighter,” *High Frontier* 1, no. 4 (August 2005): 3.

16. Kevin T. Campbell, “The Army’s Space Cadre,” *High Frontier* 4, no. 1 (November 2007): 4.

17. Commission to Assess U.S. National Security Space Management and Organization, 47.

courses, where Combatant Command and JTF planners prepare, offer little to no space training. For example, within National Defense University's Joint Advanced Warfighting School, there is no formal education on how, or where to seek expertise, to integrate space capabilities into contingency and crisis action plans. It is little surprise then that the staffs formed to augment JTFs have little experience, training, or knowledge of space capabilities, and less on how to employ them in real-world situations.

### **Planning Staff Limitations**

Closely related to the above root cause on space education and knowledge, is the impact of organization on the JFC Commander's ability to integrate optimally space capabilities. The purpose of the JTF staff is to enable the commander to execute his multi-pronged responsibilities in an effective, expedient, and competent manner. The staff should provide him expert advice on the employment of specific capabilities, such as space capabilities, to create beneficial effects or support operational efforts. Due to organization and manning methodologies to fill JTF staffs using Joint Manning Documents (JMD), however, the staff typically does not have any space expertise in the planning directorate, typically J5. Corps and division-level headquarters, which form the basis of JTF staffs in many cases, do not have sufficient space expertise in their G5. Within the G3, a Command, Control, and Communications Technical Operations (C3 Tech Ops) team contains core space expertise. This creates a situation where the future ops and long-range operational planners neglect space capabilities in their planning. The old adage, "You don't know what you don't know," comes into effect. Nor do these offices usually contain a core space officer above the rank of O-5. Without a senior

advocate in the JTF command structure, space advice rarely has an opportunity for strong consideration by the JTF Commander, particularly when it comes to planning.

The J5 is the lead for the JFC Commander's operational planning and is also the planning organization closest to the pulse of the commander. This is the commander's go-to team when he wants to work lines of operation to meet a desired end state. There are space professionals working under the CFACC (as the holder of SCA) and multitudes of experts under USSTRATCOM who do have the requisite space experience. Being outside the inner planning circle of the JTF, however, their inputs are rarely heard (or heard too late) in the planning process to integrate fully space capabilities. This is a case where the pre-determined organizational structure and the human element of communication between staffs becomes an inhibitor to optimal employment of space capabilities.

The nature of JTF organization under USCENTCOM also stovepipes space operations along with operations within the air domain. This is a function of the CFACC holding SCA in the USCENTCOM AOR for both the Iraq and Afghanistan missions. Space capabilities, however, offer effects and enhancement to military forces, civil agencies, and citizens of the host nation alike. Space not only supports air operations, but also enables ground, naval, and cyberspace operations. Therefore, the organizational structure naturally sets hurdles for space planning in support of ground-centric operations, particularly nation-building.

### **Composition of Expertise**

What space expertise is available within the geographic AOR and in support of their missions is with few exceptions all-military. The interagency and commercial space

enterprises are largely unrepresented or under-represented in the current nation-building missions underway. This is a result of the U.S. Government interagency's lack of capacity in support of nation-building. The DoD has taken the lion's share of the current mission load by necessity. In the space arena, this is no different. Getting space experts from other parts of government, particularly NASA and the Intelligence Community (IC), to deploy into the USCENTCOM AOR has been challenging. Though efforts are being made to draw a closer link between USSTRATCOM and its interagency counterparts, the focus is on collaboration and integration of systems.<sup>18</sup> The established partnerships appear to fall short of utilizing interagency expertise to assist with planning efforts supporting geographic contingency operations. This is not surprising since USSTRATCOM's priorities indicate it places marginal emphasis on providing resources, attention, and effort on the nation-building missions in Iraq and Afghanistan. With no commanders within the JTF clamoring for interagency space support, there is little push for these agencies to expend their own limited resources in support of the nation-building efforts underway.

Additionally, there is unrecognized potential for the employment of U.S. space capabilities by the civil and commercial sectors. Space capabilities enhance the average citizen's daily life within the U.S. today, and yet these same technologies are not making their way into nation-building activities. Integrating GPS, SATCOM, or geospatial imaging systems capabilities into nation-building planning and daily host-nation government activities may hold back potential economic growth and expansion of essential services. Effective integration of these available space capabilities would

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18. William L. Shelton, "Realizing the Unthinkable: AFSPC Influence Yesterday, Today, and Tomorrow," *High Frontier* 3, no. 4 (August 2007): 18.

require interagency and DoD space planners actively engaging, lobbying, and opening doors for commercial space capabilities to take root in nation-building programs.

### **JFC Engagement with USSTRATCOM**

Linked with the previously mentioned root causes is the challenge of the supported-supporting relationship between USSTRATCOM and the Geographic Combatant Command (GCC) who is executing the nation-building operation. In both Iraq and Afghanistan, separate JTF execute the respective nation-building mission in their AO. USSTRATCOM's support is via liaison officers to USCENTCOM. The CFACC acts as an intermediary in doctrine and practice using his Director of Space Forces (DIRSPACEFOR) to coordinate seam issues between USSTRATCOM and the respective JTF. However, this arrangement has its limitations. With the deployed JFC Planners as the lead developers of the nation-building mission, and with direct access to the JTF Commander, these planners should have routine and direct coordination with USSTRATCOM. In reality, USSTRATCOM coordinates with the DIRSPACEFOR, and the DIRSPACEFOR subsequently acts as an intermediary to inject space inputs into planning well underway. The DIRSPACEFOR, due to its physical and organizational proximity, is best able to influence the planning process within the Combatant Commander's (CCDR) air component.<sup>19</sup> There are significant physical (due to geographic separation) and organizational (working outside the JTF) obstacles which inhibit the usefulness of this relationship to affect planning which would impact the use of space capabilities in support of the nation-building mission.

The GCC staff must also play a role in creating an effective interface between the supported and supporting commanders. At USCENTCOM, there is a minimal space

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19. Carey, 18.

staff, whose primary function is not space operations. Space operations within this GCC are part of the Intelligence, Surveillance, and Reconnaissance (ISR) Operations branch under the Directorate of Operations (J3). The number of space knowledgeable officers within this division varies, but is always less than five due to billet authorizations from the services. These personnel are not part of the Combatant Commander's planning staff and handle an expansive portfolio of non-space related ISR mission sets that require the majority of the space-knowledgeable staff's time. Without this conduit at the GCC to Functional Combatant Command (FCC) level, the DIRSPACEFOR is currently unable to bridge the gap adequately to ensure optimal integration of space capabilities into the diverse missions underway, especially the non-combat oriented nation-building operations.

### **PRT Space Awareness**

The action-arm of the nation-building mission is the tactical unit that is bringing essential services to the host nation's people by building capacity. In the current Iraq and Afghanistan missions, the Provincial Reconstruction Team (PRT) is the lead DoD unit serving as this mechanism. These teams work directly with the local community to provide infrastructure such as electricity, running water, and services such as health care and schools. Though the PRT does include a significant number of non-military members, it does not have any resident space expertise. Therefore, it is of little surprise that the team does not think about space capabilities that they could integrate into their execution. As stated earlier, most people in the U.S. are oblivious to the multitude of systems they use daily which interact with space systems. One would not expect the PRT, without explicitly requesting such expertise, would have it resident on their team.

The PRT also provides input direct to the JTF planners on the requirements they foresee in support of the commander's intent. The PRT has the responsibility of exploring and advocating for the realm of the possible. It is through their coordination with other U.S. Government and host-nation agencies that opportunities emerge to build capacity, which ultimately translates to legitimacy for the host-nation's government. By not providing any space-related inputs through this routine upchanneling to higher headquarters, the JTF Commander is not receiving full information on the realm of the possible for application of space capabilities in support of the ongoing mission.

These five root causes interact with each other and are difficult to separate in their entirety. As the missions feed and evolve from the planning, it is essential for consideration of space capabilities from the onset to achieve optimal integration. It is clear factors resulting from educational deficiencies, existing organization structure, limited non-military involvement, supported/supporting relationships, and expertise missing from the execution element prevent optimal integration of space capabilities. With these root causes identified, the following chapter discusses mitigation options to account for, adjust, or remove impediments that prevent the optimal employment of space capabilities.

## **CHAPTER 4**

### **RECOMMENDATIONS**

Having completed a Root Cause Analysis (RCA) on the challenge of optimally integrating space capabilities in support of nation-building operations, this thesis now turns to providing recommendations. Merely identifying the crux of the problem is helpful, but proposing solutions contributes far more to the evolution of military thought and provides substantive fruit to remedy the problem. This thesis offers a series of recommendations, some broad and some specific, in the following pages. There is no single linked solution for each of the five identified root causes; rather, the reader should consider the recommendations as a whole. This family of recommended solutions provides a comprehensive set of actions to address the problem of sub-optimal integration of space capabilities into nation-building efforts conducted within a Geographic Combatant Commander's (GCC) Area of Responsibility (AOR).

Prior to introducing the proposed solution set, a discussion of risk is in order. Why is resolving this problem critical for a nation-building practitioner? Certainly, space is a newcomer in this mission set. Nation-building missions existed and completed successfully long before the space age began. The severity of not increasing space support to nation-building is low; space capabilities are no panacea in nation-building. However, in today's fiscally constrained environment, overall mission cost is one of the most important aspects defining mission success. Space capabilities have the potential to shorten the duration of U.S. involvement, therefore reducing mission costs. If employed optimally, potential exists to improve rapidly the capacity of the host nation's government to provide for its people. U.S. and Western states employ space capabilities

today more than ever before. This is not only a function of advances in technology, but that the benefits space capabilities provide exceeds those without space. With sufficient integration, the U.S. can bring to bear the benefits of space capabilities to further the transition of a state toward democratic institutions and the ability to support its people. These proposed recommendations are critical to reducing the overall duration of the mission and therefore reducing overall nation-building mission risk to the U.S. Government.

As identified in chapter three, there are five root causes of sub-optimal integration of space capabilities in nation-building missions. These are inadequate space education, Joint Force Commander (JFC) and GCC planning staff limitations, military-focused and misplaced core of space expertise, convoluted and disjointed JFC engagement with U.S. Strategic Command (USSTRATCOM), and Provincial Reconstruction Team (PRT) awareness. Except where stated, recommendations came from the author's personal experiences on various space-related staffs, including as a member of the Director of Space Forces (DIRSPACEFOR) staff within U.S. Central Command (USCENTCOM) during the surge in Iraq (2008), and as a service component planner within the Air Component to USCENTCOM between 2006 and 2009. Recommendations presented offer a candid view and suggestions on updating space doctrine and education in light of the anticipated increase in nation-building missions in the first half of the twenty-first century. The core of the recommended changes revolves around three lines of operation – a review of space doctrine and education, enabling sufficiency of government in respect to space capabilities, and pushing space planning and integration to the lowest levels of the interagency team executing the mission.

## **Evolve Doctrine and Education**

Much of the problem of integrating space capabilities into nation-build operations is a residual outcome of current U.S. DoD Joint doctrine and the resultant education that underpins their employment. Chapter two of this thesis presented a summary of the doctrinal framework for employing space capabilities in support of nation-building. A foundation exists across a combination of Joint, Army, and Air Force doctrine documents. The lessons learned during the 1991 Persian Gulf War were the basis of this generation of writings, and the corresponding capabilities and force structures in place today. The focus of space education also emerged from this era with adjustments following the Space Commission Report in 2001. It was not until the recent missions in Iraq and Afghanistan that this doctrine was tested and subsequently revised. However, military theorists and doctrine writers provided those recent updates while wearing counter-insurgency (COIN) colored lenses. Specifically, combat actions related to COIN were the dominant emphasis of the doctrine updates. The element of the mission focused on non-kinetic operations, particularly elements of the nation-building mission, did not receive adequate attention in the space doctrine writings. Therefore, the evolution of doctrinal writings and ultimately the published updates failed to address adequately the new role space capabilities can support regarding nation-building missions. The doctrine merely codified the tremendous growth in space capabilities in enhancing the precision and lethality of kinetic combat operations. Education has kept pace with the adjustments to doctrine, but again reinforces the doctrinal shortcoming regarding the integration of space support to nation-building. This lack of attention to the non-combat missions space capabilities can support must change to address the expected continuation of nation-

building missions in the twenty-first century. The following sub-sections propose areas where doctrinal and educational improvements are required. Paramount is a need to raise “integration” as a new space mission area, update capability requirements, adjust command and control (C2) of space forces and capabilities, and an expansion of space education to multi-service planners.

### **Acknowledge Integration as a Core Mission Area**

Doctrine shapes the force structure and capabilities the services acquire, organize, and train to source for the warfighting combatant commands. In this regard, space is no different from other major force capabilities. Joint, Army, and Air Force doctrine all discuss space capabilities available to GCC to support their execution of contingency operations. Joint Publication 3-14, *Space Operations*, presents space capabilities in its four traditional mission areas. These mission areas are Space Force Enhancement, Space Support, Space Control, and Space Force Application.<sup>1</sup> Relevant to nation-building are capabilities inherent in the Space Force Enhancement and Space Control mission areas. The U.S. Army’s Field Manual (FM) 3-14 describes space capabilities particularly useful for ground operations. These include satellite communications (SATCOM), Position, Velocity, and Timing, Environmental Monitoring, Space Intelligence, Surveillance and Reconnaissance (ISR), Theater Missile Warning, and Space Control.<sup>2</sup> All of these, except Space Control, which has its own mission area, fit into the Joint doctrine’s definition of Space Force Enhancement. The Air Force doctrine on space operations

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1. U.S. Department of Defense, Joint Publication 3-14, II-1.  
2. Department of the Army, Field Manual 3-14, 3-2.

reflects a mirror of the capabilities described by the Army service doctrine.<sup>3</sup> The doctrine as written coincides well with current COIN operations, particularly operations enabling the establishment of security. The doctrine diverges from the realistic application for space capabilities when applied to non-combat operations, such as those that dominate nation-building operations. The current doctrinal focus is on bringing friendly kinetic operations to a higher level of precision against an enemy force, both in terms of timeliness, and location. The space community and GCC planners became skilled in the enhancement of kinetic fires using space capabilities in Iraq and Afghanistan. In nation-building, however, the effects produced are not upon an adversary, but in unison with the host nation. Objectives include building legitimacy of the host government and improving the standard of living for the local populace. With the narrow focus of current doctrine, the space capabilities considered for integration into the Joint Force Commander's campaign is incomplete. This leaves what may possibly be the best space capabilities to enhance nation-building mission success out of normal doctrinal consideration.

The next edition of space doctrine at the joint and service levels must account for this discrepancy between enabling kinetic operations and supporting non-combat nation-building endeavors. An additional mission area is required called Space Integration. Though acknowledged as a challenge to employing space capabilities, particularly in Air Force doctrine, effectively integrating space capabilities requires trained personnel, tools, and a special mindset. Integration is not a foregone conclusion. Space education within the U.S. military revolves primarily about understanding the domain, and operating specific systems that operate in that unique environment. Taking an individual who has

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3. Department of the Air Force, Doctrine Document 2-2, 4.

operated one of these systems and providing them with intermediate joint/service education, does not mean they have the skills to integrate non-standard space technologies into ill-defined problems or unconventional missions. Developing an operational core of space-smart personnel who think solely about linking unique space-based, or through space, capabilities in support of unconventional contingencies is essential. Add planning expertise, access beyond DoD space systems to include civil and commercial capabilities, and links to the appropriate space C2 nodes and space has a chance of being optimally integrated. A pre-requisite to this, however, is making Space Integration paramount and co-equal to the acknowledged core space mission areas in doctrine today.

Space Integration as a core mission area provides doctrinal consideration for joint forces to integrate commercial, civil, and defense capabilities to speed the stand-up and initial functioning of the host nation's civil capacity. The myriad of space capabilities available to do this are great and as technology improves, there will be new capabilities available. Examples of this mission area would include the integration of space-based environmental monitoring to support fledgling agricultural development. It would also include multiple-linked capabilities such as using PNT with SATCOM as critical tools enabling future emergency 911-like emergency services. Space capabilities could be used to enable tracking of host nation vehicles, or possibly the critical movement of petroleum resources to distant cities. In essence, all of the means used to support civil society in the U.S. and in Western nations today must be considered as tools of the U.S. national security establishment to achieve its nation-building objectives. Providing a

doctrinal foundation for the integration of these capabilities into non-combat missions is the next evolution on U.S. space doctrine.

### **Required Capabilities**

Raising integration to the level of a core mission area is the crucial first step in preparing for optimal employment of space capabilities in the twenty-first century. It is not the only change required, however. Integration as a mission area requires not only trained planners and technicians, but also capabilities. As technology improves, the range of specific system capabilities available to the space community expands.

Undoubtedly, the classic capability requirements, such as those Force Enhancement capabilities described above, will continue. As appropriate, these systems should be weaved into nation-building operations. These are not the only capabilities, however, for a JFC to integrate into the overall mission effort. Emphasis should be on integrating civil and commercial systems that provide utility at the unclassified level and that the host nation can use after termination of the nation-building mission. Therefore, the U.S. military must examine implementation of commercial sector innovations and make them available to the JTF in complex operations. The requirement for these capabilities must also make their way into existing joint and service doctrine and filter down to GCC requirements and service acquisition plans.

The development and formal acquisition of often-expensive space systems is not the only option. The U.S. should consider the use of pre-contracted capabilities that could be available on-call to support nation-building initiatives. These primarily include SATCOM and environmental monitoring capability to provide capacity for newly established or fledgling host nation governments. The U.S. can use this capability as a

means to help setup infrastructure. Without inclusion in doctrine, however, this needed capability will likely not be realized until mid-contingency at which time it may be too late, given the lengthy lead time necessary to procure contracts. By establishing a ready force of capabilities geared for capacity and available for synchronized integration immediately, the joint force can strengthen the host nation's ability to provide essential services for its citizens.

### **Command and Control (C2)**

The C2 structure employed for space forces and capabilities is ill-suited to the non-combat missions the U.S. will engage in throughout the twenty-first century. The origins of the current construct are from the Cold War while U.S. Space Command (USSPACECOM) existed. Although the latest revision to JP 3-14 includes the change from USSPACECOM to USSTRATCOM and the creation of Joint Functional Component Command Space (JFCC-Space), the C2 construct remains confused for space forces working within a GCC. This recommendation will not discuss the C2 of space forces deployed into a GCC; it focuses specifically on the planning and integration element for space capabilities supporting a nation-building mission in a GCC.

JP 3-14 codified Space Coordinating Authority (SCA) as a normalized authority. Within the GCC, SCA is by default given to the Combatant Commander (CCDR) for all space forces within his GCC. The CCDR can further delegate this authority to a subordinate commander as required to synchronize planning and integration of space capabilities in support of the designated mission. For both missions in Iraq and Afghanistan, the CCDR of USSCENTCOM assigned SCA to his Combined Forces Air

Component Commander (CFACC).<sup>4</sup> The Air Force created the position of the Director of Space Forces (DIRSPACEFOR) and codified it within Air Force doctrine under AFDD 2-2. In accordance with service doctrine, the CFACC employs the DIRSPACEFOR to conduct day-to-day management of SCA on his behalf. The recent publication of JP 3-14 acknowledges this as the current working situation.<sup>5</sup>

JP 3-14 did provide a recommendation on how SCA might work in a GCC. It recommended a jointly manned space element at the appropriate level of command to coordinate across the service and functional components within the AOR.<sup>6</sup> This idea is exactly what is needed. Though voiced by a previous DIRSPACEFOR, it has not gained doctrinal acceptance.<sup>7</sup> By tying space integration and planning with the air component, the CCDR unintentionally links space with air component strategy and the Air Tasking Order (ATO). Simultaneously, the JTF, and specifically the ground combatant elements beneath, attempt their own space planning. Coordination that does occur between the CFACC (as holder of SCA) and the supported JTFs is fragmented, and often times becomes tense due to personnel rotation policies, lack of familiarity with the on-the-ground conditions, and a general separation due to having two distinctly separate commanders. By failing to direct a joint SCA construct, JP 3-14 effectively codified the current imperfect relationship.

This thesis recommends a revision to JP 3-14 where doctrine directs the space C2 relationship for planning and integration be joint. This idea coincides with the construct

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4. U.S. Department of Defense, Joint Publication 3-14, III-4.

5. Ibid.

6. Ibid.

7. Carey, 18.

presented by Wille and Arthur in their 2006 Naval Post Graduate School Thesis, and argues for its inclusion in Joint doctrine.<sup>8</sup> Stating a formal relationship to the Air Force, as tradition has, or the Army, who often argues they need the authority with the greatest number of troops in harm's way, is not necessary. Differing situations may require different components, including the Navy and Marine Corps, to be lead. In all situations, however, a joint construct with representation across the components trumps service parochialisms and allows the CCDR to place the element at the right level to coordinate the integration of space capabilities for the missions at hand. This in turn also argues for the same joint team coordinating with the GCC's staff and outside with USSTRATCOM and other elements of the U.S. space community. Certainly, the picture gets more complicated with assigned space forces residing within the GCC, but a joint construct at or above the JTF-level is appropriate for integration and planning across the GCC's AOR.

### **Educational Imperatives**

Codifying a joint element to lead all space capability integration and coordinate planning efforts across a designated mission will pay tremendous dividends. This construct alone, however, is no silver bullet. It requires a professional staff trained and skilled in the art of weaving disparate space capabilities into assorted missions across the spectrum of conflict. Therefore, this thesis now turns to ways to improve space education supporting the joint force.

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8. Daniel P. Arthur and Dennis G. Wille, "A Proposed Architecture for Theater Coordination of Global Space Capabilities,," Master's thesis, Naval Postgraduate School, 2006. <http://handle.dtic.mil/100.2/ADA456982> (accessed July 31, 2009).

The resultant training improvements from the 2001 Space Report have gone a great way in improving space education. Army and Air Force training, in particular, has improved from one-time initial general space training, to a multi-course paradigm that is injected into an officer's education at the junior, intermediate, and senior levels. This training, though superior to the preceding training regime, remains focused on far too narrow a set of participants. The core space operators of the respective services are a small number when compared to the greater number of operators and planners through the DoD. Most core planners within GCC and JTFs have little to no space experience. Therefore, opportunity to optimally integrate space contributions into the overall mission concept of operations is missed.

To remedy this problem, the integration of space capabilities needs greater presentation in an academic environment outside the standard courses for space professionals. The advanced planning schools of the U.S. DoD (Army's School of Advanced Military Studies, Air Forces' School of Advanced Air and Space Power Studies, Navy's School of Advanced Warfare Studies, Marine Corps' School of Advanced Warfighting, and the Joint Advanced Warfightng School) require a concerted lesson in integrating space capabilities. The intent of this curriculum addition is not to create new space professionals; rather, the purpose is to open the eyes of these essential planners to the possible applications for space capabilities and offer their integration as a component of any contingency or crisis action plan. Focusing on the students from these planning schools would pay the greatest dividends to ensure GCC and JTF planners do not overlook space capabilities during the operational planning process.

With planners and space professionals thinking about space integration, the other target audience for focused space integration awareness is the JTF Commander's and their senior staffs. The focus here is merely on providing basic awareness, insight into new capabilities available, and managing expectations. Typically, senior officers unfamiliar with space capabilities are amenable to integrating capabilities their staff planner's deem as contributing to the effectiveness of the overall mission. With this in mind, senior service schools and capstone courses should establish an enhanced baseline regarding the capabilities, limitations, and planning considerations of space-based systems. Particular emphasis must include how to integrate these capabilities into JTF planning and execution.

### **Enable Sufficiency of Government**

The natural tendency for U.S. military planners is to conceive planning options employing forces and capacities inherent within the DoD. Joint and service doctrine's lead military planners this direction, and military education reinforces this notion. When a military coalition is involved, the planning team expands its list of available capabilities to consider for combined execution with little difficulty. Expanding a mission to include participation from other U.S. Government departments is often a complex challenge that rivals, or may surpass, the complexity of working with international military partners. Integrating the interagency to employ a whole-of-government approach is difficult due to differing priorities, cultures, funding, and lack of understanding of each department. Yet, across government agencies, there is general understanding and increasing emphasis to transcend these issues and provide a concerted sufficiency-of-government approach to

problems.<sup>9</sup> The visceral reaction among those in the U.S. Government is that coordination across the various departments of the executive branch should not be so difficult. The missions in Iraq and Afghanistan remind us of the difficulty in planning and executing complex missions particularly when cross-department competencies and funding streams come under challenge. With concerted effort to overcome impediments, these missions have successfully transformed from military-only combat operations to an interagency nation-building mission, yet much work remains. This thesis will not address overarching issues regarding interagency coordination, but will discuss means to achieve optimal integration of all space capabilities in U.S. led contingency efforts, particularly nation-building.

As discussed previously, nation-building is a unique mission set that transcends the core competencies of many U.S. interagency departments. The two prominent leads are the Department of State (DoS) and the DoD, and each mission differs on the unity of effort, and command structure employed. This thesis uses the term “sufficiency-of-government” to imply the necessary elements of the U.S. government are working together in support of a common objective. The intent here is not to downplay the term “whole-of-government” and its corresponding movements within the U.S. Government. In the context of space capabilities integration, though, only a small number of U.S. agencies would be involved, many of which are in the Intelligence Community (IC). Therefore, sufficiency-of-government is needed to maximize space capability integration as the lack of this unified effort is central to the challenge of integrating space capabilities into contingency operations.

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9. Department of Defense, “Report on Improving Interagency Support for United States 21st Century National Security Missions and Interagency Operations in Support of Stability, Security, Transition, and Reconstruction Operations,” (June 2007): 7.

This thesis offers four suggestions to improve sufficiency-of-government in regards to space capability integration in complex multi-departmental U.S. Government efforts. The first is to establish an inter-governmental lead space coordinator. Second is to establish an inter-governmental space cadre. Third is to establish joint and interagency combined exercises. Finally, a full U.S. government approach requires outreach and coordination with the commercial space sector. This thesis discusses these four recommendations in the sub-sections that follow.

### **Inter-Governmental Lead Space Coordinator**

Unity of Command, a core principle of war, is often unobtainable in interagency operations. Unity of effort becomes the lynchpin, essential to the success of any such complex mission.<sup>10</sup> Integrating space capabilities into nation-building missions face the same challenges of typical relief and reconstruction efforts (i.e. police force training, electricity distribution, functioning economic system), except the players differ. Bringing together disparate U.S. Government agencies, all who have an impact with space capabilities, is a tremendous challenge to current integration efforts. Iraq and Afghanistan have proven many great successes for the integration of space effects, but the majority of these were with DoD resources and enhancing combat related operations. Bridging organizations, which hitherto had no reason to work together outside domestic U.S. efforts, to integrate effectively space capabilities into non-combat missions with an international scope remains a challenge. Therefore, a single lead space coordinator, with power to coordinate the interagency and the DoD, is a requirement.

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10. U.S. Department of Defense, Joint Publication 1, Doctrine for the Armed Forces of the United States, March 20, 2009, VII-1.

Some may argue this construct already exists under the auspices of SCA, which the Director of Space Forces (DIRSPACEFOR) manages on a daily basis in the current USCENTCOM construct. The previous recommendation discussed the problems with this paradigm. The lead interagency space coordinator must be at a higher level than the current DIRSPACEFOR who typically serves under the CFACC. If within the military staff, the interagency space coordinator needs to serve directly for either the JFC or GCC Commander. Others recommend this role go to USSTRATCOM as the global SCA for DoD. The challenge here is the ability for USSTRATCOM to synchronize efforts with the executing JTF given their physical and time zone differences, and multitude of missions they are already supporting. Both the current USCENTCOM and USSTRATCOM constructs present military-centric solutions and are at odds with National Security Presidential Directive 44 (NSPD-44), which codifies the Secretary of State as the U.S. Government lead for reconstruction and stabilization efforts.<sup>11</sup>

In light of NSPD-44 and recent experiences in Iraq and Afghanistan, it is this author's opinion that three things need to happen to enable functioning unity of effort for space capability optimization. First, there must be a designated lead space coordinator who has coordination authority above the DoD. This authority can only come from the President or the National Security Council (NSC). Second, the interagency space capabilities coordinator must work solely on the designated mission at hand within the engaged AOR; this cannot be a tertiary or ad-hoc responsibility added onto an existing manager in the Executive Branch establishment. The position requires the individual to have close consultation with the DoS nation-building lead and the JFC. Third, the

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11. President George W. Bush, Proclamation, National Security Presidential Directive 44, (December 7, 2005): 2.

individual must have the capacity to energize the commercial space community as off-the-shelf commercial-type applications used in the private and civil sectors will be most useful in nation-building missions.

While there is no current position in any interagency department which meets these requirements, this thesis proposes that USSTRATCOM should posture an additional Deputy Director of Operations at the O-7 Grade (or Senior Executive Service equivalent) to fill this role as the Interagency Space Coordinator (ISC). The position will, per standard practice, become part of the supported GCC's staff and work directly for the Combatant Commander. The ISC would have DIRLAUTH with the Ambassador and JTF Commander executing the nation-building effort. The ISC's staff would be a small team of joint and interagency space officers (or equivalents) that would physically embed with the JTF J5 Planning Staff. The physical proximity allows them to link directly with the planning efforts by the JTF and other interagency departments. However, by remaining organizationally separate from the JTF they will not be subsumed into non-space related efforts. The ISC will enable the flow of information and coordination between USSTRATCOM and the affected GCC. An important distinction between this and the current DIRSPACEFOR, is that the USAF appoints and mans the DIRSPACEFOR from its service space component, Air Force Space Command. Using the construct recommended by this thesis, the position is raised up to a the joint level and at the General Officer grade which provides additional clout to coordinate among DoD and non-DoD elements. The ISC could be a civilian with suitable experience such as a deputy administrator from the National Aeronautics and Astronautics (NASA), which might serve for USSTRATCOM in preparation for the execution of such missions. There

are multitudes of possible means to identify and fill this position, but the key is that the position links the GCC and USSTRATCOM while enabling cross communication from the affected GCC to the commercial space community.

### **Establish an Inter-Governmental Space Cadre**

Establishment of an ISC is the first step, but without an adequate support staff, the ISC's ability to enact the position's charter is limited. Finding a qualified staff to work interagency coordination is difficult. Narrowing that pool to experts on integrating space capabilities and there will likely be an insufficient number available to support ongoing and future nation-building missions. Therefore, the second sub-recommendation to enable sufficiency-of-government in regards to optimal space integration is the establishment of an interagency space cadre. This takes the 2001 Space Commission's recommendation for a DoD space cadre and brings it up to the next level.

As the services expanded their reliance on space, the ability to integrate space capabilities into joint and multinational combat operations increased. The evolution in combat operations since the 1991 Gulf War is a testament to this success. Much of this evolution was due to the emphasis each service, and particularly the Air Force and the Army, placed on creating a subset of personnel with specific space knowledge. The Air Force employs its Space Weapons Officers, graduates of the U.S. Air Force Weapons School, to perform integration functions within the air component of each GCC. Many of these individuals served in support of the missions in Iraq and Afghanistan, with priority placed on enhancing the precision and lethality of combat operations. The Air Force also placed many of these individuals, and other space professionals with knowledge in reconnaissance systems, counterspace operations, and other capabilities, into rotational

assignments as part of the DIRSPACEFOR staff under the CFACC. The Army likewise provided a deputy DIRSPACEFOR and trained teams called Army Space Support Teams (ARSST) from its space component, Space and Missile Defense Command/Army Strategic Command (SMDC-ARSTRAT).<sup>12</sup> These ARSST embedded into corps and division level headquarters providing tremendous operational capability and an enhanced planning focus for all things space within the ground component. Navy and Marine Corps interest in space integration expanded throughout the first decade of the twenty-first century. Coordination between deployed Carrier Strike Groups and the DIRSPACEFOR staff are now the norm, and deployed Marine Corps forces now regularly request augmentation by both an ARSST and a trained AF Space Weapons Officer. Furthermore, these teams are beginning to bridge out to work with coalition partners to help them with integrating space capabilities.

Unfortunately, there is no core of deployable space professionals outside the DoD who have the requisite training and expertise to integrate disparate U.S. Government and commercially available space systems. Establishment of an interagency cadre of personnel from DoD, DoS, NASA, Department of Commerce, Department of Transportation, and the Intelligence Community (IC) is the first step. These individuals should represent their departments (or community) at equivalent grades and influence of military officers in the grades of O-4 to O-5. Pre-requisite is the ability to reach back into their respective departments and coordinate efforts at integrating space capabilities in support of their respective departments core competencies as it relates to nation-building. Training for these individuals should initially stem from the DoD construct employing

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12. Larry J. Dodgen, "Leveraging Space to Support the Changing Paradigm," *High Frontier* 1, no. 4:10.

the National Security Space Institute (NSSI), and should eventually grow add a unique element that teaches the integration of space capabilities into these unique missions. This is a level deeper than the current courses, which introduce capabilities and understanding of the space domain. The current curriculum does not force the student to achieve a synthesis level of education, which enables students to apply their knowledge into effective application in a real-world mission. Each respective executive agency whom plays a role in space capabilities integrate should then posture these individuals, once trained, to support exercise and real-world contingency operations. Respective departments will need to adjust their personnel systems to avoid hindering individual career advancement for those assigned to an ISC staff.

### **Joint and Interagency Exercises**

Within the DoD, an integral part of building an experienced and capable force to handle contingency situations is formal exercises. This provides an environment for active application of an individual's prior training. Learning from the hands-on experiences prevents significant errors during real-world execution. Nation-building missions likewise need a similar training scenario to practice the ISC and interagency space cadre before their parent agencies deploy these individuals into a new or ongoing contingency operation.

This is a particular challenge as inter-governmental nation-building exercises in general are in short supply. This is likely caused by the tremendous resources, both manpower and money, going directly into missions in Iraq and Afghanistan. It is further compounded by pop-up missions such as domestic hurricane relief, or the earthquake relief operation in Haiti that began in January 2010. If a large-scale exercise is not

available for space planners from across the interagency sector to participate, the space community should take it upon themselves to consider a future wargaming scenario specifically for a non-conventional nation-building mission. This could leverage the existing Schriever wargaming series or might be an entirely new event. This sort of exercise is the only way, short of real-world execution, for the interagency community to unveil, test, and validate new theories on interagency space doctrine for nation-building. This concept may be too far reaching at the present, but it is an eventually necessary step for the interagency space community to grow together and achieve success in non-combat oriented contingency mission sets.

### **Include the Commercial Sector**

Inclusion of interagency planners to integrate space capabilities increases the effectiveness of those capabilities beyond mere support to kinetic-orientated combat operations. Experts from the commercial sector can further enhance integration efforts by bringing their technical system expertise into the planning process. The commercial sector engineers space systems that are viable today and currently in use supporting civil communities throughout the developed world today. This is an important distinction between commercial and DoD space systems. Most DoD systems are used in support of traditional conventional threats, or whose missions are a legacy of strategic requirements from the Cold War. Conversely, the commercial sector provides capabilities supporting the civil sector around the world with assorted communications, remote sensing, and other technologies. The commercial sector, therefore, has much capability available for contract use. As they are in the business of making money, they often times have existing capabilities that might support an ongoing or future nation-building mission. A

partnership with the commercial sector ensures the interagency space planners consider all of the available space capabilities for employment to enhance the effectiveness of the nation-building operations.

This is not to suggest that the interagency space planning team has the authority to open the U.S. Government's pocket book and procure anything the commercial space sector offers. It is an acknowledgement that there is tremendous space expertise outside the interagency realm and that space acquisition is a lengthy process. If the right capability exists in the commercial sector, interagency space planners can lead efforts to streamline the acquisition (or contractual employment) of existing commercial on-orbit space technologies to enhance the mission. Successes in Iraq and Afghanistan, particularly with the counter-improvised explosive device (counter-IED) initiatives, were in large part due to the rapid acquisition of capable equipment to defeat these devices. As U.S. and coalition forces countered each insurgent device, the adversary forces employed new IEDs using further advanced technologies, which in turn, required new counter tactics and equipment. Optimizing space capabilities for nation-building can be thought along a similar line of reasoning. Most of the space-based technologies which can most effectively enhance nation-building efforts are outside the current DoD (and interagency) capabilities inventory. Access to new technologies that apply specifically to building local infrastructure and enhancing the legitimacy of the host nation government is essential.

This recommendation goes beyond simply employing the Joint Urgent Operational Needs Statement (JUONS) as a means to procure life-saving or mission-critical equipment. It calls for a partnership between the ISC, the affected GCC,

USSTRATCOM, and the commercial space sector to coordinate the employment of space capabilities. Due to the nature of most space enhancements, the space capabilities available for employment in the commercial sector will not meet the criteria for JUONS. This means that the interagency and JTF effort must follow standard U.S. Government acquisition and contracting methods. By pinpointing capabilities available for contractual use, the ISC can greatly increase the speed to employ these systems and therefore further optimize space capabilities employed in support of the mission.

### **Involvement Where it Matters**

The previous two sets of recommendations focused on methods to improve the way space capabilities integrate with the nation-building mission at the operational level. There are ways to adjust the “organize, train, and equip” piece to prepare for the integration of space capabilities. There is also the need to expand the planning team beyond the existing GCC and JTF structures to embrace a sufficiency-of-government when it comes to space planning. None of these recommendations, however, speaks to methods to fix the problem at the tactical level. To avoid this discussion would be an unacceptable shortcoming of these recommendations. This next set of recommendations ties the recommended adjustments with the execution level of the nation-building mission. Space capabilities require consideration where it matters and that is with those working with the host-nation’s government and people. By linking the “doers” with the resources and expertise of the interagency and commercial space sectors, optimization of these unique capabilities may occur. This is because the lowest level is where understanding of the needs of the local government and people is most evident. This thesis recommends four changes to forge this linkage between the tactical and operational

levels. First, it discusses the required linkage between the PRT and space planners. Second, it recommends an adjustment to the space planning team resident within the JTF. Third, this thesis recommends a stronger linkage between the JTF, the GCC, and USSTRATCOM. Finally, this thesis proposes a solution to link with the interagency.

### **Ground-Level Involvement**

Integration between space capabilities and combat forces succeeded because the space experts and the combat arms personnel not only realized there was potential synergy, but specifically because they worked together. Great successes originated from embedding space professionals within the combat corps. Today, there are Army and Air Force space professionals working at the corps and division level in Iraq, and at various levels across Afghanistan. Integrating space-knowledgeable personnel directly into the execution arm is the best way to ensure higher-level planners address true needs at the tactical level. This is the greatest hindrance to the current nation-building missions underway in Iraq and Afghanistan. There is little to no linkage between the Provincial Reconstruction Team (PRT), the primary executor of nation-building, and higher-headquarters space planners on the GCC, JTF, and CFACC (as traditional holder of SCA) staffs.

To remedy this disconnect, the PRT requires an embedded space planner. This could be either a temporary or a permanent inclusion into the PRT team. The individual could rotate, acting as a consultant for multiple PRTs. The primary function of this individual would be to understand the needs of the current mission and translate those needs into priorities that space capabilities might fill. The PRT space planner, as this thesis will call him, funnels these requests up to the division or corps level (as

appropriate) and then works with higher-headquarters space planners to understand the needs of the PRT. The PRT space planner will be a voice at the lowest level speaking with first-hand experience of the most pressing needs as the team works to build infrastructure and civil capacity that underlies the host nation's claim to legitimacy.

This concept is not unlike the previous evolutions where space personnel (both Air Force and Army) embedded themselves into combat arms branches and special operations forces conducting kinetic-orientated combat operations. Both of those arrangements are thriving. Using a similar construct to merge space capabilities with PRT efforts would move further toward optimal employment of U.S. space capabilities. In addition, it needs stating that this position would not necessarily have to be a U.S. military officer. The PRT space planner could be a trained and proficient space expert from another branch of the U.S. Government.

### **Planning Level**

After linking the PRT to division and corps planners, the next step is linking these division/corps planners to the staff of the commander with SCA. There needs to be a linkage between the elements conducting the nation-building mission and the GCC (and potentially the JTF as well). JP 3-14 recommends a best practice where a joint team of space professionals conducts day-to-day management of SCA functions.<sup>13</sup> This thesis recommends acceptance of the JP 3-14 best practice with expansion to include the Interagency Space Coordinator (ISC) construct. The ISC, as presented previously, needs to be the connective tissue linking the tactical and operational levels, spanning from the streets of Baghdad to the conference rooms of Washington DC. Acknowledging this best

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13. U.S. Department of Defense, Joint Publication 3-14, III-4.

practice in Joint doctrine is not sufficient; this allows the GCC to choose selectively a construct that avoids addressing the challenges of joint and interagency coordination for all things space. Therefore, this thesis recommends the next edition of JP 3-14 make the joint space planning element a required element and expand it further to include interagency, and potentially commercial, representation. This team serving at the operational level needs to have not only a firm link with the tactical level, but also the wherewithal to recommend realistic space capabilities for integration in existing efforts. Then it requires the means to connect with the right capability providers across the entire U.S. Government. A joint and interagency team is necessary to bring this gap and provides the best means to ensure synchronized unity of effort throughout the nation-building mission.

### **Support Goes Both Ways**

One of the challenges for the ISC and his/her interagency planning element is how best to coordinate with the lead global space integrator, U.S. Strategic Command (USSTRATCOM). The typical method to do this is with a USSTRATCOM liaison officer (LNO) with the GCC. Experience in Iraq and Afghanistan proves that the LNO at the GCC does not provide sufficient linkage between the JTF executing the mission and USSTRATCOM. This issue became apparent during the global planning for the planned shoot-down of the re-entering U.S. satellite to ensure the debris did not cause harm to humanity. The author personally experienced difficulty in receiving information from the USSTRATCOM LNO at USCENTCOM while serving on the deployed DIRSPACEFOR staff. There is a distance between the GCC staff, which spans the strategic-operational levels, and the JTF staff, which focuses on the operational-tactical levels. What is

missing is a direct USSTRATCOM link to the commander holding SCA, or the future ISC, and JTF itself. Therefore, an improvement to enable synchronized efforts between the USSTRATCOM and the JTF planning the theater-level mission is to add additional USSTRATCOM LNO at these deployed headquarters. These LNO could also come from USSTRATCOM's Joint Functional Component Command for Space (JFCC-Space). A LNO should be part of the integrated planning element staff (where SCA resides) and at the corps-level staff. Like the previous recommendation for the PRT, the position provides expertise and linkage, and can be either a military member or civilian within the interagency construct.

### **Linking With Interagency**

The final element missing in the recommendation is a mechanism to link seamlessly the tactical executors with the operational-strategic planners at the highest level of U.S. Government. There is no currently codified bond holding the interagency space contribution together at the senior departmental levels within the U.S. Government. As the nation-building missions further integrate space capabilities as critical enhancers, the need will grow to coordinate interagency, and commercial, contributions to the efforts. To ensure the proper level of review while providing firm policy guidance for space capabilities, this thesis recommends the creation of an Integrated Planning Committee (IPC) serving under the National Security Council (NSC) staff to coordinate and guide interagency coordination for multi-agency employment of space capabilities. This IPC would not get into directing daily operations or recommending areas for integration. Its focus would be specifically on establishing policy and resolving interagency space coordination issues. It creates an environment for Department of State

(DoS), as the lead agency for nation-building, to work out space-related issues with DoD and the IC. This committee would not be standing, nor would it have a regular meeting schedule. The IPC serves strictly to resolve differences in opinion and to ensure the entire weight of the U.S. Government offers up space capacity, as appropriate, to the nation-building effort.

These recommendations are insufficient alone to remedy the challenges of optimizing space capability integration in nation-building missions. Together, however, they serve to address the problem's root causes in totality. The set of solutions is multifaceted. First, the focus is on adjusting the acknowledged and documented best practices for the use of space capabilities in support of nation-building efforts. This includes the training for each space professional and who also needs this education to be effective in their role as JTF planners. Second, the solution acknowledges and pushes for the space contribution to nation-building expand beyond the typical mind-set of DoD-only systems. This thesis argues for the space contribution to encompass the entire U.S. Government, harnessing the full resources of the interagency. It suggests an addition partner, the commercial space sector, should also be included. State-of-the-art technologies used in the commercial sector have particular use in non-combat missions, particularly where the capability enhances the ability of the host nation's government to provide essential services. Finally, these recommendations acknowledge that a synergizing glue is necessary to ensure unity of effort from the tactical execution level, through the operational planning level, and to the strategic resource allocation level across the U.S. Government. Linking these recommendations together provides a pathway to evolve current practices. The net result is not only effective use of space capabilities, but

optimized employment that brings the totality of the U.S. space capabilities to bear on the nation-building mission at hand.

## CONCLUSION

Space capabilities are a critical component in any U.S. and multi-national operation. The use of space capabilities to enable successful kinetic operations has sped the rapid transformation of U.S. and allied capabilities over the last twenty years. The 1991 Persian Gulf War truly was the “first” space war. It ushered in an era of rapidly changing military tactics and operational art, which continues to this day. Along with the advances in space capabilities to enhance combat operations, space capabilities transcend their military utility and now are an integral part of life for governments and their civilian citizens around the world.

In a similar vein, the expectation of the U.S. engaging in a conventional in the future has diminished. Replacing conventional warfare is a significant likelihood for an increased number of small-scale contingencies such as those the U.S. engages in today within the borders of Iraq and Afghanistan. Nation-building operations emerging from these contingencies, or as the primary effort, will become routine in the first half of the twenty-first century. Drawing from experiences in Germany, Japan, Kosovo, Haiti, Somalia, and Bosnia, Iraq and Afghanistan, the U.S. is expanding its capacity to execute nation-building efforts as the forecast demand rises.

The goal of uniting the growth of space capabilities with nation-building operations to enhance the success of said missions is the wave of the future. Elements of this trend are already underway in Iraq and Afghanistan. Experience tells us, however, that military planners think about using DoD space systems to solve combat-related problems, such as increasing accuracy of kinetic strikes, or detecting adversary attacks. Applying civil and commercial space capabilities used by interagency partners or offered

up by commercial vendors for a service fee is outside the expertise of the current nation-building planners. When it comes to space capabilities, most current Geographic Combatant Command (GCC) and Joint Task Force (JTF) planners do know have the diverse knowledge set to know where to start.

Fortunately, this situation is reversible. This thesis unveiled a comprehensive series of recommendations to address the root causes of the problem. Three major areas require redress. These include the need to adjust doctrine as well as the content and target of space education and training for both GCC and JTF planners and senior commanders. On the implementation side, unity of effort requires enhancement at the joint and interagency levels by the creation of a single Interagency Space Coordinator (ISC). Part of this also includes a sufficiency-of-government approach, including the commercial space sector, to optimize space capability integration. Finally, these efforts will not bear fruit unless there is an integrating factor from the lowest tactical level executing the nation-building mission to the strategic/operational nexus.

This thesis should have given you an appreciation for the contributions of space capabilities into U.S.-led operations. The means and methodology for space integration continue to evolve in today's operations. Nation-building is a unique challenge for military planners, especially the employment of tools once reserved for strategic applications, or whose very capabilities seem cloaked in secrecy. The missions in Iraq and Afghanistan provided ample opportunity to remove obstacles between the space capability employment and the theater warfighter. Optimization of space capabilities in nation-building is on the verge of reality, but staying the course will not guarantee success. Attacking the root causes of non-optimization in nation-building is the only way

to ensure future space capability enhancement in these missions. The unified efforts of the military, interagency, and the commercial sector must coalesce in a single unified effort to ensure optimal employment of the High Ground in nation-building missions.

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## VITA

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