BRIDGING THE STRATEGIC TO OPERATIONAL GAP:

AIR MOBILTY IN NATURAL DISASTER RELIEF

BY

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APPROVAL

The undersigned certify that this thesis meets master's-level standards of research, argumentation, and expression.

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DISCLAIMER

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.

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For my wife and sons, without their love, patience, and support, the completion of this research would not have been possible. Their enduring and unequivocal sacrifices in support of my profession and career are without bounds, and the year spent researching and writing this paper is no exception.

ABSTRACT

Each year, the Department of Defense can expect to respond to at least one major natural disaster. This research paper examines the air mobility component of two major natural disaster operations that occurred approximately one year apart: Operation UNIFIED RESPONSE, the U.S. response to the 2010 Haiti earthquake, and Operation TOMODACHI, the response to the 2011 Great Eastern Japanese Earthquake and subsequent Fukushima-Daiichi nuclear fallout crisis. The air mobility enterprise resides at the seam between the strategic and operational levels of war. Therefore, military leaders must understand the strategic landscape and implications as well as mobility-relevant operational limitations and factors in order to best utilize air mobility assets. The analysis is an effort to draw on common elements between the two operations as a means to create a framework of considerations for military decision makers. These considerations will assist commanders who employ air mobility assets in a natural disaster relief operation. The research concludes by offering a set of six common considerations that, when understood and addressed, can significantly aid military leaders in increasing air mobility efficiency and effectiveness during a relief operation.

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Foreword

Telephones never ring as loud as they do at 3 o'clock in the morning, sending a shock through a sleeping body that feels something in between a gut punch and being shot out of a cannon. A sleepy, middle-aged hand, a pilot's hand, reaches clumsily to answer the bedside telephone. His hands have an age spot for every birthday missed, every ocean crossed because of calls like these. "Hello" comes out in a sleepy southern drawl, or what's left of it after more than two decades of living far from home—and Momma. "Sir, you're alerted", says the young dispatcher on the other end. "You're heading to Haiti".

The telephone call turns a small cog in the enterprise known as air mobility – a mission that began in World War II, born from the marriage of a Himalayan mountain crossing and a Berlin standoff between new enemies. Air mobility is more than exhausted pilots and airplanes big enough to block out the South Carolina summer sun.

It takes people, living off coffee and conviction, working around the clock in sophisticated command centers that seem to come straight out of the Death Star. It takes the young airman loading pallets onto the airplane in the pouring rain, because no matter what, it's better than his childhood in the ghettos of New Orleans. A life where he couldn't ride his bike outside of his house, out of fear of the stray gang bullets that had already taken his little sister to Heaven. It takes the crew chief — his boots, fingers, and soul coated in grease, working another shift that was supposed to end four hours ago, to make sure the airplane, his baby, takes off on time. It takes the loadmasters, flying their first mission together who will eventually attend each other's children's Christenings, weddings, and one far too early funeral. Because nothing creates a life

long bond between young men as does trusting your life to each other while bullets and shoulder-fired missiles streak by you over the skies of Afghanistan.

Air mobility, the enterprise, takes people to succeed. People named Tunner, who don't see the East German sky as a collage of blue and white, but as the perfect location for a conveyor belt operation. Not the type of conveyor that produces bicycles or car engines, but one that conducts a symphony of complex flying machines, delivering food, heating oil, and hope.

It takes people named Jackson, who will receive salutes from the Presidents of the United States for the rest of his life. Because in Vietnam, against orders, he refused to leave men behind under fire—not as long as he had the ability, and an airplane, to do something about it.

It takes people willing to answer the call at 3 o'clock in the morning to help their fellow human. To help people who have experienced, and will experience, a pain you and I will never know. Those who watched parents, friends, spouses, wash away into the sea under swells of water that seem to betray a rainbow colored promise from Genesis. Those whose arms cling tightly to their lifeless little babies, all because the earth opened up and took buildings, people, and joy away deep into its belly.

This paper is the story of disaster relief—if such a word as "relief" is even palatable under such pain. The natural disasters over the past decades left scars on cities, people, and souls, from which there will never be a true sense of relief. This is the account of how people who fly, fix, schedule and load airplanes can provide help to those who have never needed it more—and provide a glimmer of hope. How they did it when earthquakes and tidal waves tried to destroy the land and the people of Haiti and Japan. And how they must be ready to act when the Earth decides that it is time to hurt itself again.

Chapter 1

Introduction

On average, the US military can expect to respond to one major natural disaster per year. While the armed forces only make up a part of the whole-of-government approach to disaster relief, military forces nonetheless comprise the vast majority of US response assets. Air mobility is the military cornerstone of many disaster relief operations. Air Mobility delivers tons of critical supplies to the victims as well as the response force. It delivers government aid workers, non-government responders, and diplomats to name a few. Air mobility is also the method of choice for the often loosely coordinated mission of non-combatant evacuation operations (NEO).

For most military operations, there is an extensive pre-planning process that occurs, prescribing the tasked units and platforms, identifying their requirements so they can train and prepare for them, and crafting a multitude of contingency or backup plans to allow for unforeseen circumstances that tend to occur. Further, before the military finalizes a plan, multiple coordination authorities review the proposal to ensure it is the most appropriate. After this approval process, adequate resources are tasked for the operation.

Disaster relief, by nature, is not afforded the same luxury as a traditional military operation. Natural disasters occur with little or no warning and degrade or destroy many of the capabilities that military planners rely on to plan and coordinate appropriately. Two strategies of thought exist on planning for disaster relief. First, there is an advocacy for thorough pre-planning to occur for as many likely scenarios as planners can imagine. This strategy is clearly resource intensive; to complicate matters, the natural unpredictability of disasters can quickly negate any preplanning efforts. However, it is easy to see the high value

in having a pre-stocked library of detailed plans, the details of which can be adjusted based on the particulars of a natural disaster when it occurs. Furthermore, the US government (USG) and the Department of Defense (DoD) already archive a vast collection of documents and reports from past operations, allowing planners to extract valuable lessons, so they may better plan for future relief operations.

On the other hand, some advocate that because natural disasters, as well as the characteristics of relief operations, are unpredictable, that the most appropriate course of planning action is to have *no* preplanned and detailed response. This second approach occurs most often in relief operations. There are two primary reasons for the preference not to preplan disaster relief. First, in contrast to the preplanned operation, the second approach is resource-friendly. It does not require large numbers of personnel spending countless hours planning a response operation to a natural disaster that *might* strike. Secondly, commanders prefer flexibility and options. A formalized operations plan (OPLAN) potentially reduces the flexibility and options available to decision makers.

Ultimately, the status of DoD's disaster response planning is about balancing costs and benefits. As a whole, the US military's response to natural disasters has been very successful. No operation has been without hiccups and lessons learned, but the US, and particularly air mobility, has responded quickly and effectively when tasked to act. Therefore, adding substantial costs to preplan relief operations does not necessarily seem optimal when considering the relatively successful track record of previous relief operations.

Therefore, the question at hand is to determine where the benefit in planning can occur. As established above, operationally and tactically, there is little use in pre-planning disaster relief due to the inherently unpredictable nature of disasters. At the strategic level, there is a lack of detail to predict how best to conduct relief operations. After his experience with the 2011 Japanese earthquake and tsunami disaster,

Major General Brooks Bash, as Vice Commander of Pacific Air Forces, commented on pre-existing relief operations plans on hand: "[it is] is a worthy goal, but I don't think that's ever attainable because every operation is different. I think what you need is a very strategic level document that says, 'these are your planning considerations'."[1]

This recommendation describes precisely the intent of this research. This study aims to explore high-level considerations that are flexible enough to apply to most, if not all, US military disaster relief operations. At the same time, the planning considerations should be detailed enough to be useful to decision makers and planners.

There is a substantial amount of intellectual space that exists at the seam of the strategic and operational levels of disaster response. A thorough study of military considerations that need to be discussed, understood, and acted upon has not yet occurred for disaster relief operations. These considerations need to be generalized enough so that they apply to any natural disaster relief operation in which the US military plays a substantial role. The bank of considerations must also include facets that are operationally detailed enough to provide decision-makers with quality information.

This study seeks to examine a list of considerations for the air mobility mission in disaster relief operations that reside on that seam between the strategic and operational levels. Because air mobility plays such a highly proportionate and vital role in US military disaster relief doctrine[2], it is an ideal area of study to propose relevant considerations for research.

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[1] Bash, Maj Gen Brooks L. (former Vice Commander, Pacific Air Forces) interviewed by Mr. John Trifonovitch, PACAF/A9 and Mr. Steve Diamond, PACAF/HO, 15 April 2011, 4.

[2] Doctrine is defined as "fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires

This study will analyze two historical cases of air mobility in US military disaster relief operations based on six strategic and operational considerations. These factors are not unique to air mobility and can apply to many areas of disaster relief. However, the six considerations will be used as a practical template to study their impact and considerations on the air mobility mission in disaster relief later in this research. The six considerations are:

1. Nature of the Disaster – What exactly occurred and how has it affected the host-nation? How does the disaster environment affect US preferred doctrine? What areas of the doctrine can the US not conduct due to the nature of the situation? What is being requested of the US? What abilities of the host-nation survived?
2. Authorities – What authorities does the host nation retain? What have they ceded to the international community/UN? What authorities does the US military have? Are there scenarios when the US assumes it has authorities that are not explicit?
3. Command and Control (C2) – Who is the decision authority? What is the best C2 framework to best support the host nation? Does it differ from what is best for the US? Does it differ from what is best for the international effort? Does the proposed C2 structure take the most optimal advantage of the natural disaster environment?—and if so, how?)
4. Resources – What resources are immediately available to the military response commander? Are they the most capable resources? For personnel, are they the actual experts based on the situation? If not, how does the commander get access to the best resources?

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judgment in application" (Joint Publication [JP] 1-02, *Department of Defense Dictionary of Military and Associated Terms*)

5. Infrastructure – How has the disaster affected the infrastructure? How does the changing infrastructure affect US doctrine? How does the US alter its doctrine based on the nature of the infrastructure? Are there methods to reconcile the difference between the actual situation and the preferred method of operating?
6. Political Implications – What is the political state of the host nation? What are the political circumstances of the international community and the US's place within it? How does the US's preferred doctrine affect the policy decisions of politicians? Do US military operations in a disaster relief affect the perception of the US by the host nation, neighboring countries, or the international community?

These questions are not meant to represent the whole of understanding in disaster relief. Nor are they intended to be a checklist. Rather, the questions posed are simply examples of the type of thinking that must occur at the strategic and operational seam. If a military commander has a grasp of each of these six categories of considerations, he or she will be much better prepared to respond to a disaster—with more appropriate and timely resources—than commanders have been in previous cases.

This study will examine two separate case studies, both of which occurred only one year apart, in which US air mobility played a significant role. Against the context of the two cases, this research will explore the six consideration areas of each case study to describe the decisions and actions that occurred and how they affected the operations outcome. The two case studies are Operation Unified Response during the Haiti earthquake disaster in 2010, and Operation Tomodachi during the Japanese earthquake and subsequent tsunami in 2011. These two

operations were selected for a multitude of reasons that can help bring to light the applicability of the six proposed considerations.

First, both operations relied heavily on US air mobility aircraft, aircrews, and their supporting enterprise. Millions of pounds of relief aid were delivered by airlift aircraft such as the C-17 Globemaster III, Air Mobility Command's go-to cargo delivery machine, and the C-130 Hercules, a smaller delivery aircraft, but able to land in areas that larger aircraft cannot. Second, both operations occurred at essentially the same time in history. Operation Unified Response was in January 2010 while Operation Tomodachi occurred barely one year later in March of 2011. This time factor means that the command structure, doctrine, and fleet of aircraft available for both operations were virtually identical. This similar framework provides a useful research comparison.

The differences in the nature of the response environment are also reasons for choosing these two operations. The Haiti response occurred very close to the US. The geographical location of Haiti significantly affected the American response effort. Administratively, although US Southern Command (USSOUTHCOM) is responsible for US activity in Haiti, the short distance allowed the flexibility for US Northern Command (USNORTHCOM), as well as the Federal Aviation Administration, to play significant roles in the response. Additionally, the proximity to major US shipping ports allowed millions of pounds of relief aid to be delivered by maritime container ships. Interestingly, due to the resultant congestion and delays at the international airport in Haiti, it was not uncommon for aid supplies to reach Haiti by ship before they could arrive by aircraft. In contrast, Operation Tomodachi was conducted extremely removed from the US mainland. As a result, planners had to approach the problem set differently when establishing authorities, the command and control framework, and tasking resources.

This research seeks to analyze the six conditions of disaster response for the US military, and in particular, air mobility. From the

analysis, this study will attempt to highlight how the conditions, decisions, and actions related to each category affected the operation's effectiveness and/or efficiency. Armed with a set of validated considerations, future commanders who are tasked with conducting relief operations will be much better prepared to conduct a military disaster response with confidence in their ability to deliver effective aid in crises that are inherently clouded with chaos and confusion.

Chapter 2 provides a background in current disaster relief for the United States. The primary focus of US disaster relief policy is interagency coordination and cooperation. Usually, the US Agency for International Development (USAID), a humanitarian organization established by the Kennedy administration, is the normal lead agency for disaster relief. Thus, all other federal organizations conduct operations in support of USAID. This chapter will discuss how the knowledge base of federal disaster relief is overly focused on the federal interagency aspect and leaves a significant gap in prescriptive guidance for military commanders. Conversely, operational level material on disaster relief is very specific to an operation, a region, or a military unit. This specificity makes it very difficult to apply to the larger spectrum of relief operation possibilities. As will be shown, air mobility is an asset that can be used for political, strategic, operational, and tactical purposes. Because of this, a framework of considerations for air mobility's role in disaster relief must be applicable both strategically and operationally.

Chapters 3 and 4 will deep dive into the cases of Operation Unified Response and Operation Tomodachi. Although faced with very different challenges, commanders were able to employ military forces, specifically air mobility, with great success. However, the two cases presented entirely different problem sets that both fit neatly within the title of disaster relief. These chapters will explore decisions and actions within

the framework of the six considerations and how they influenced the operation.

The final section of this study will extract the major lessons from the case study and synthesize the material as to determine if the six considerations did, in fact, influence the outcome of the relief operations. It is the hope of this research that, with a firm grasp of these six considerations, military commanders will better understand those factors that affected air mobility in disaster relief in the past. Armed with such knowledge, commanders will be equipped to better employ the air mobility enterprise the next time a natural disaster strikes.

Chapter 2

Background on Disaster Relief

The United States is no stranger to disaster relief. The Department of Defense responds to disaster relief operations both domestically and internationally. Statistically, the DoD can expect a major disaster response operation each year. This predictability demands a structured approach to disaster operations. Unfortunately, nature, scale, location, and response required for each disaster can vary immensely. The needs and authorities for the DoD response to the 2010 Pakistan floods are severely different than those in the 2005 Hurricane Katrina response, even though they were both flooding emergencies. Because of the variance between any multitude of given natural disasters, any models or understanding of disaster relief must be flexible enough to remain germane to the topic, yet specific enough to be actionable.

Currently, the national response model resembles those in academia. They stress a whole of government approach, loosely identifying and defining authorities and boundaries between government organizations and non-government organizations (NGOs), describing capabilities for decision makers to employ, and how organizations can cooperate to increase efficiency and effectiveness. The shortfall with the national models of disaster response is two-fold. First, the models are overly encompassing. That is, disaster response touches so many organizations and processes, that it is virtually impossible to cover all of the aspects in detail. Secondly, the first shortfall makes it so that none of the organizations involved have actionable guidance.

At the operational level, some combatant commanders gathered lessons learned and best practices to develop a working model for disaster response. These commands can have preplanned response teams, ready to coordinate efforts across the government. These models

are very useful to combatant commanders in understanding and communicating lines of efforts. Joint Task Force Haiti (JTF-H) developed a robust operational model for the Haiti Earthquake relief of 2010. The model was specific, useful, and encompassing of all of those assets in JTF-H's sphere of influence. The problem with this type of "lessons learned" operational model approach is that it makes many potentially unrealistic assumptions. Each disaster may not organize via JTF or have those same capabilities at the demand of the combatant commander. Furthermore, air mobility is seated at the seam between national strategic and operational models. A better understanding of the authorities, capabilities and limitations of any given air mobility response operation will reduce the chances of friction points that come about when the nature of an operation or organized response structure is not as expected.

Strategic Disaster Response

Contemporary understanding of disaster response began after World War II. It was a result of a significant growth in the development of private voluntary and inter-government organizations.[1] Additionally, the World Health Organization (WHO) was established in 1946. The WHO is the only one of the four sub-organizations of the United Nations that was developed to address DR in the international community.[2] The United States Agency for International Development (USAID) is the primary US representative to the UN. USAID works within a framework that is best described by experts as a coordinated effort of organizations that most resembles a network of actors versus a hierarchical or command structure.

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[1] R.C. Kent, *Anatomy of Disaster Relief: The International Network in Action*, (New York, NY: Pinter Publishers, 1987), 33.
[2] Kent, 38.

The US framework is no less organized. It is also a network of government organizations and NGOs. As a result, much of the academic effort over the past 40 years has been spent understanding and explaining the roles and responsibilities of the US organizations involved in DR.

Operational Disaster Response

Combatant commanders (CCDRs) serve as the focal point at the operational level of disaster relief. Most often, the CCDR will be the supported commander and will be assigned or allocated all of the DoD forces assigned to the disaster operation. CCDRs are organized by either geographical region or core function. CCDRs can choose to build or tailor their concept plan (CONPLAN) or model of disaster relief based on their geographic region or function. The advantage is that the CCDR can focus on or account for aspects that are unique to that command's organization or geography. For example, US Northern Command's (NORTHCOM) considerations for disaster relief are going to be very different than US Pacific Command's (PACOM) due to the differences in geography and NORTHCOM's legal restrictions on federal forces within US borders.

Operational disaster models are often a result of an operational plan (OPLAN) that is not a preplanned or pre-coordinated product. In Haiti, for example, General Keen, the Joint Task Force Commander, had a robust and detailed OPLAN. However, the actual plan for implementation was not fully created until after the disaster struck.

Push and Pull Logistics

The international national relief model describes three primary phases of disaster relief: Emergency, Rehabilitation, and Post-Rehabilitation.[3] Each response operation for the DoD has had some

[3] Kent, 12.

form of a similar trinity. Because the DoD typically operates in the response, and perhaps the rehabilitation effort, DoD commanders tend to redefine the trinity in terms that equate to some form of Recovery, Sustainment, and Transition.

The logistics enterprise is a key actor in the recovery and sustainment effort. Delivering appropriate and timely supplies to a disaster zone is of paramount importance to any relief operation. Inevitably, disaster relief operations will be extremely dependent upon the logistics system. Not only does the affected population require a nearly insatiable amount of emergency supplies, but also the large numbers of response workers require millions of pounds of supplies and equipment to perform effectively. CCDRs and response organizations do not have to have expertise in logistics. However, it is crucial that they understand that the logistical train to supply their operation in extremely complex and nuanced. Therefore, they must have a conceptual understanding of the certain considerations that will severely affect their relief effort. Furthermore, they must have quick and direct access to mobility and logistics experts that can activate the enterprise in an efficient and effective manner.

A major consideration that will affect all supply chains is the concept of push vs. pull system. A pure push system is one in which a supplier or distributor does not wait for demand information from the user. The supplier will ship whatever kind and quantity of product he or she deems appropriate. In a pure pull system, the supplier or distributor does not ship any cargo without a specific demand signal of type and quantity. While very few systems are either purely push or purely pull, it is paramount that decision makers in disaster relief have an understanding of the spectrum and how it will effect their operation.

The nature of the disaster relief environment will not allow decision makers to have a fully efficient operation. Disaster relief supply chains

are inherently ambiguous due to the chaos and unusual conditions.[4] Most disaster relief operations are heavily prone to a push system. Once a disaster occurs, governments and NGOs begin to ship millions of pounds of cargo for which they assume there is a requirement. Often they are correct, at least in part. A major limiting factor in a logistics supply chain is often not the demand amount of cargo, but rather how much cargo can be throughput and distributed through a system. For example, the airport for the Haitian earthquake relief quickly became bogged down and nearly halted all relief aid distribution because extreme amounts of cargo arrived at a port that could not handle the volume. On the other extreme, if organizations wait for accurate demand signals in a disaster, it could severely delay getting aid to the needed location and cause great amounts of suffering and loss of life. This paradox is why understanding the environment and predicted capabilities in a geographic area is so crucial for commanders and decision makers. A delicate balance of supply and demand on the push-pull spectrum will provide desperately needed aid supplies without clogging or halting the logistics system. This balance can only be accomplished with intensive pre-disaster planning exercises, real-time communication in the command and control system, and a responsive logistics supply chain.

Air Mobility

Air mobility is a major actor in disaster relief. In the early stages of an emergency, it is widely acknowledged that the best method regarding speed and security for distributing food aid is air transport.[5] Air Mobility Command (AMC) serves a critical capability in disaster relief. It is the penultimate combination of rapid global logistics and military

[4] Gyongyi Kovacs and Karen M. Spens, *Relief and Supply Chain Management for Disasters: Humanitarian Aid and Emergency Logistics,* (Hershey, Penn: Business Science Reference, 2012), 29.
[5] Kovacs and Spens, 136.

mobilization. Military logistics are perfectly suitable for operations in disaster areas. Due to ability and familiarity with operating in environments without stability, infrastructure, and communications and they can respond quickly. Military forces are most useful in early stages for security, communications, and aerial delivery of cargo. Furthermore, the military is useful due to its high funding levels for preparedness.[6]

Air Mobility delivers cargo via two broad categories: airland and airdrop. Airland delivery consists of cargo aircraft landing at an aerial port of debarkation (APOD) and offloading cargo on the ground by using forklifts, manpower, or specially designed machines called K-loaders. Airdrop delivers cargo pallets, equipment, or troops via parachute drop operations onto a pre-designated area on the ground called a drop zone. Airland and airdrop both have significant advantages and disadvantages to either method. Airland delivery is the standard method and can often get the most cargo per aircraft to the desired area. However, many circumstances would justify airdrop as the most efficient or effective method. While access to an appropriate landing runway or airfield is the most common driver of airdrop, the list of possible circumstances and considerations is extensive—another reason mobility expertise and involvement in the command structure is critical to success.

Proposal

Thus far, this research has presented an understanding and approach to disaster relief from the national strategic perspective and the operational level. These lenses provide greater insight into how to best accomplish disaster relief. Furthermore, this paper has provided a broad description of the primary considerations for the logistics system. Lastly, we have presented the strengths of air mobility and its place among the strategic and operational frameworks. This placement is where this

[6] Kovacs and Spens, 123, 127

research fills gaps in disaster relief academia. The strategic model is too vague and focused on coordinated efforts of a network to be prescriptive. The operational models are accurate enough to provide actionable detail but are often not created until after disaster has struck, or are not applicable across geographic areas of responsibility. Through the use of the following case studies, common factors and considerations will be drawn out to provide planners, decision makers, and commanders a framework of categories that must be understood and considered to maximize air mobility effectiveness and efficiency in a disaster relief operation.

Chapter 3

Operation UNIFIED RESPONSE

On January 12, 2010, a 7.0-magnitude earthquake struck the Caribbean country of Haiti. Over the course of several minutes, the earthquake and its follow-on effects claimed over 316,000 lives, injured 300,000 more, destroyed 300,000 buildings, and displaced over 1 million citizens of an already impoverished country. The Government of Haiti was rendered effectively out of business when the force of the quake toppled 14 of 16 government ministries and killed numerous top government officials. The remaining Haitian officials had no choice but to seek immediate and overwhelming disaster relief support from the United States.[1]

Due to the amount of physical and organizational destruction, scale of international response, and complexity of the relief coordination, the Haiti earthquake response serves as a cornerstone of modern DoD operational disaster relief planning and execution, particularly for air mobility operations. While search and rescue aircraft were essential in Haiti, air mobility aircraft made up the preponderance of assets transiting Haitian airspace. The amount of damage and suffering required immense amounts of rescue and relief supplies and troops. An understanding of how air mobility was integrated into Joint Task Force – Haiti (JTF-H) is essential for taking lessons learned forward into inevitable future relief operations.

Haiti serves as an excellent case study into modern military and air mobility relief operations for multiple reasons. First, with Haiti located so close to the US mainland, organizations that normally have

[1] Cecchine, G., et al., *The US Military Response to the 2010 Haiti Earthquake: Considerations for Army Leaders*, (Washington, DC: RAND, 2013), xi.

smaller or non-existent roles in relief operations were allowed to participate on a larger scale. Secondly, President Obama's "whole of government" commitment resulted in multiple parallel lines of effort that caused unnecessary complication, duplication, and friction. Lastly, the smaller distance to the US aerial ports of embarkation (APOE) allowed supplies and troops to arrive in relatively short periods of time. The time and distance factors also played a significant role in the ever-present battle between efficiency and effectiveness.

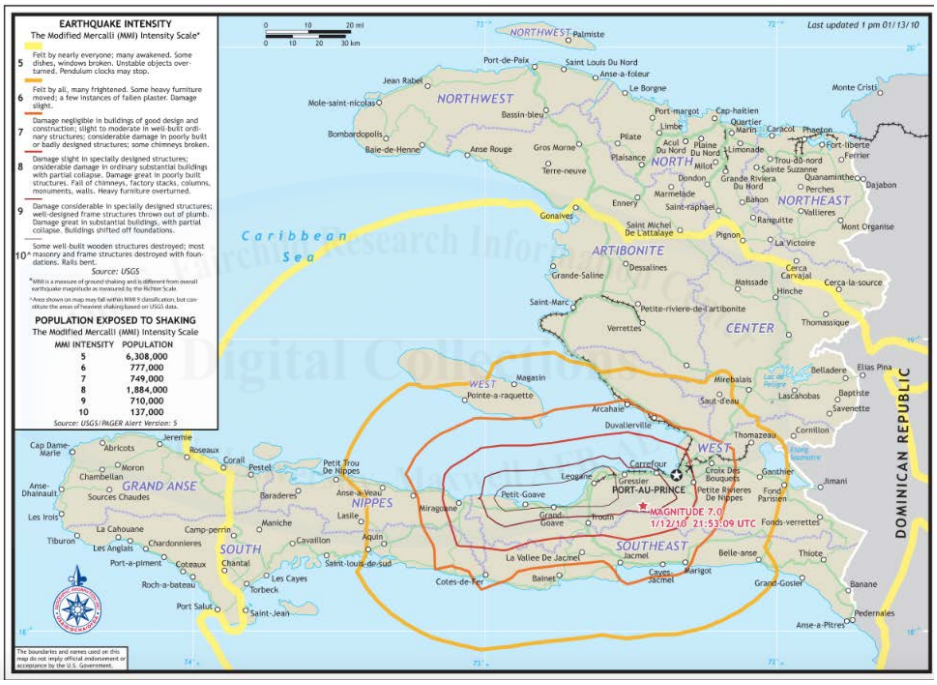

Figure 1. Map of Haiti Earthquake

Source: USAID

Nature of the Disaster

In order to respond to a natural disaster effectively, an organization must have, at a minimum, a level of understanding of the situation so the organization can respond with the appropriate assets at the appropriate time, with the appropriate coordination and authorities in place. When the earthquake struck Haiti, the US was clearly the most

capable and resource laden nation in the world. In addition, the US is located geographically closer to Haiti than any other developed nation. Nevertheless, no country—not even the US—can begin to provide disaster relief in any hemisphere without a proper understanding of what challenges and restrictions it is facing.

The Haiti earthquake was the most destructive natural disaster by far, in terms of casualties, in the 34 years since the Tangshan, China earthquake of 1976.[2] Based on potential reporting errors from previous disasters, it is possible that the Haiti earthquake was the most deadly disaster in over 100 years. Not surprisingly, the US military response to the disaster was the largest military humanitarian response in history.[3] As will be pointed out, the robust response was massively effective in performance metrics, but its measures of effectiveness were much more ambiguous (and in many areas, actually nonexistent). This ambiguousness is, in large part, a result of the lack of a full understanding of the nature of the disaster and the associated actual needs of the host nation population versus what could be provided quickly and en masse.

The disastrous earthquake effectively decapitated the Haitian government, and killed the two senior United Nation officials in Haiti. Serendipitously, the US SOUTHERN COMMAND (SOUTHCOM) Deputy Commander, Lieutenant General P.K. (Ken) Keen, was already in Haiti when the earthquake hit. General Keen was on an official visit with the U.S. Ambassador to Haiti, Kenneth H. Merten. To his credit, General Keen was quick and decisive with the military response once the request came from the Government of Haiti (GoH). However, due to the scale of the disaster and the envisioned necessary operational response, General Keen did not wait for any requirements request before dispatching forces

[2] Cecchine, 2.
[3] Cecchine, 31.

to supply and evacuate the country.[4] In other words, he did not have a full understanding of the needs of the populace and emergency workers before providing supplies. For example, in many disaster situations, potable water and medical supplies are the top two requirements on scene. Thus, it is not surprising that the initial response forces brought millions of liters of water to the airfield at Port Au Prince.

The chief problem, however, one not understood initially by the response forces, was that the country actually had no shortage of potable water.[5] Response forces simply assumed water was a critical need, and flooded the airport ramp with pallets of potable water. There were two major negative impacts of this endeavor. First, vast amounts of valuable cargo space and weight were wasted on an item that was not needed. Aircraft loads in air mobility operations are typically limited by either maximum cargo space or maximum cargo weight restrictions. Liquid cargo is extremely heavy by relative standards. Therefore, pallets of unnecessary water severely limit the amount of cargo weight that could be taken instead. Second, warehousing and distribution operations are quickly bottlenecked and rendered ineffective when bogged down with supplies that have no required destination. At the Port Au Prince airport, cargo yard space was extremely limited. Counter intuitively, having too much supply on hand can lead to very bad situation. The situation gets even worse when the excess supplies have no requested end user to which to distribute. Warehousing and distribution are discussed further later in the chapter.

General Keen, appointed the JTF-Haiti commander within two days of the earthquake, deserves credit for aggressively organizing a humanitarian response. However, without a fuller understanding of the nature of the disaster and its resultant effects, an enormous force was

[4] Cecchine, xiv.
[5] 601st AOC members, in discussion with author 25 Sept 2015.

mobilized without a clear request for supplies or capabilities. A better analysis of the situation, particularly in key focus areas may have led to a more effective use of precious cargo space.

Authorities

It is key to understand that the final authority for all relief operations in a foreign nation resides with the host nation's government. The host nation will typically seek international assistance from the United Nations. The US, as part of the UN, routinely utilizes a Combined Joint Task Force (CJTF) structure to employ its military aid. Within the US, the lead organization for disaster relief is the US Agency for International Development (USAID). The US military is a supporting organization to USAID. However, because USAID has few personnel and even fewer physical capabilities, the DoD often assumes the preponderance of workload in a disaster situation.

In Haiti, because there was no electrical power and thus no ability for the Government of Haiti (GoH) to contact the UN, the ministry sent a messenger to the US Ambassador to solicit help from the US. President Obama immediately responded by committing the "whole of government" to aid relief efforts. USAID was quickly named the lead US agency and obtained all US authority to direct or administer relief operations. However, USAID's personnel and capability were not sufficient to respond to the scale of the devastation. USSOUTHCOM was designated as the lead US military component due to the fact that Haiti resides within its area of responsibility (AOR) and Joint Task Force Haiti (JTF-H) was established with General Keen as commander.

USSOUTHCOM, like the majority of its counterpart commands, is geographically defined and has the war-fighting mission within said boundaries. Generally speaking, USUSSOUTHCOM, based in Miami, Florida, is responsible for all military operations south of the US mainland within the western hemisphere. The bulk of its mission lies

within Central and South America. Historically, USSOUTHCOM's focus has largely been on counter-narcotics operations. Commander, USSOUTHCOM reports directly to the Chairman of the Joint Chiefs of Staff, who reports only to the President.

USSOUTHCOM was primarily responsible for counter-narcotics operations and had recently reorganized into a different structure than the standardized air operations center (AOC) model. Therefore, organizationally, it was not optimally suited for a large-scale air operation such as required by the earthquake. Furthermore, USSOUTHCOM is a smaller organization than its counterparts. This led to manning and capability shortfalls that had to be reconciled.

Having obtained the role of military authority, USSOUTHCOM and JTF-H went about establishing the necessary command and control network that would allow such a massive operation to begin its major phases.

Command and Control

Command and control (C2) is closely related to, and a natural product of, legal authority. In Haiti, the command and control network was especially important and effective. However, the network was also overly complex due to the larger than normal number of organizations participating in the mobility operation.

Once established, General Keen and JTF-Haiti stood atop the US military command and control structure for Haiti. General Keen was able to accomplish an astounding amount of relief operations in a short period of time, saving innumerous human lives and preventing further suffering. However, drawing upon after action reports, this research will discuss potential flaws and redundancies in the command and control system that responded in Haiti as a means to provide more efficient and effective capabilities for future relief operations.

The doctrinal air arm of JTF-H was the 12th Air Force/AFSOUTH located at Davis-Monthan Air Force Base, Arizona. Resultantly, the 12th

AF Commander was designated the air component commander for JTF-H and was subsequently responsible for all air operations in the area of responsibility (AOR). The geographic separation of AFSOUTH in Arizona and JTF-H in Miami contained inherent challenges in communication. Furthermore, air mobility experts had to figure out how to integrate into physically separated headquarters in order to provide timely and necessary information to both commanders.

The 12th AF quickly recognized the complexity of the air mission in Haiti. Soon, a single airfield with only ten parking spots became operational while hundreds of aircraft attempted to arrive to provide aid workers and supplies. The airspace above Haiti eventually resembled a stirred-up hornet's nest. Dozens of aircraft were in makeshift holding patterns while others diverted or returned to their destination without delivering their cargo. To complicate matters further, other international aircraft simply landed without clearance or approval, creating potentially dangerous situations.[6]

Without resident mobility expertise in Davis-Monthan on disaster relief operations, the 12th AF solicited capabilities from the 1st AF/AFNORTH at Tyndall AFB, Florida.[7] The 1st AF and its 601st Air Operations Center (AOC), had gained valuable experience in major disaster relief during Hurricane Katrina operations. Specifically, the 601st learned how to control the flow of vast amounts of air mobility assets into and out of congested airspace.

The first, and arguably most crucial, action taken to control the airspace above and around Haiti was to gain temporary airspace control and organize the flow of air mobility aircraft. JTF-H and the FAA negotiated with the GoH to gain temporary control of Haitian airspace.

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[6] 601st AOC members, in discussion with author 25 Sept 2015.
[7] Ellery Wallwork, et al., *Operation Unified Response: Air Mobility Command's Response to the 2010 Haiti Eartquake Crisis*, (Scott AFB, Ill: Air Mobility Command, 2010), 4.

Subsequently, the 601st AOC established the Haiti Flight Operations Control Center (HFOCC) to manage the aircraft flow. In an organizational structure that mirrored the genius of the famed Berlin Airlift, the HFOCC established a slot time system, mandated a standardized flow direction of aircraft, and created basic and easily implemented aircraft arrival procedures. For an aircraft to be allowed into Haiti, it first had to obtain an arrival slot time and follow the prescribed flight procedures into the airfield. The actions and capability of the HFOCC alone severely reduced the chaos of the multi-national and multi-agency airlift operation.

Air Mobility Command's (AMC's) C-17 and C-130 aircraft, along with AMC's commercial partners, comprised the lion's share of relief cargo aircraft in Haiti. As such, the success of the command and control of such vast amounts of flights was not by accident. AOCs rely on air mobility expertise and coordination from specially trained and high-ranking mobility experts known as Directors of Mobility Forces (DIRMOBFORs). Due to the percentage of mobility flights in Haiti, DIRMOBFORs played a critical role in translating and coordinating requirements and operations between the headquarters and the 618th AOC at Scott Air Force Base, Illinois, home of AMC, US Transportation Command (USTRANSCOM), and the 18th Air Force (AMC's operational component).

Once mobilized the 618th TACC accomplished phenomenal work in scheduling aircraft and aircrews to the mission. Establishing an aerial port of embarkation (APOE) proved a little tricky. Again, air mobility is not a core mission for USSOUTHCOM. As a result he first APOE envisioned was Homestead AFB, Florida.[8] Homestead seemed a logical choice due to its location in south Florida and its inherent security. However, for a mobility operation, location is only one of many important

[8] Wallwork, 11.

factors. Homestead lacked the men/material handling equipment (MHE), cargo space, and aircraft handling capacity. It took mobility-minded experts to recognize the situation and reestablish the APOE at Charleston AFB, SC, a C-17 main operating base with ample parking, aircraft handling capability, and aircrew staging capacity.

Doctrinally speaking, US Transportation Command (USTRANSCOM) will rarely change operational control (CHOP) of strategic airlift aircraft to other combatant commands (COCOMs), and did not CHOP any in Haiti. Therefore, significant coordination within the C2 structure was critical to getting the right cargo to the right place at the right time. AMC deployed personnel familiar with the cargo requirements system, known as joint operational planning and execution system (JOPES), to JTF-H to collect, prioritize, translate, and input relief requirements into the TRANSCOM system. Without these personnel and their expertise, the streamlined success of the sustainment phase of the operation would not have been possible.

Command and control is not complete once an aircraft has launched. Without C2 on the ground in Haiti, the operation would have been over before it began. Within hours of the earthquake, the 1st Special Operations Wing at Hurlburt AFB, Florida deployed a Special Tactics Team (STT) to the Toussaint L'Ouverture International (TLI) Airport in Port-au-Prince.[9] Imbedded into the small STT were Combat Controllers, special operators highly skilled in controlling special operations aircraft under hostile conditions. The TLI airport control tower was destroyed in the earthquake. However, the STT was able to open the airport to flights within a matter of minutes of arriving. Also in the first few hours after the earthquake, AMC alerted its Contingency Response Group (CRG). The CRG's core mission is to establish and open an airfield, then receive and support mobility aircraft over an extended

[9] Wallwork, 2.

period. Units within CRGs are also organizationally tailorable to meet commanders' needs in the crisis based on an expected amount of aircraft and cargo throughput.

Figure 2. Combat Controllers Guide Aircraft at TLI.
Source: USSOUTHCOM

The CRG was deployed to TLI as part of the JTF-Port Opening (JTF-PO) mission of USTRANSCOM. USTRANSCOM activated the JTF-PO elements to repair and open the seaport in Haiti, as well as to open a distribution operation at TLI. Doctrinally, Air Force assets control the airfield in a JTF-PO operation, and US Army logistics personnel control the distribution center and operation. In Haiti, Air Force personnel from the CRG arrived at TLI and assessed that the STT was performing excellently at controlling the traffic pattern of arriving aircraft, but were quickly out of their element once the aircraft were off the runway. Aircraft were parked incorrectly, and the general state of the parking area was chaotic.[10] It took mobility-minded CRG individuals to integrate with the STT, establish order to the parking apron, and provide an efficient and effective operation to deliver the cargo to the holding and

[10] Wallwork, 19.

distribution center. The STT members were not pleased, at first, to have CRG personnel integrated into their team at the runway and occasionally overruling their decisions. However, within 24 hours, the throughput of aircraft was doubled, and the STT and CRG were fully integrated to maximize effects.[11]

Haiti was unique in many ways, not least of which was the organization of C2. The participation of more than typical numbers of organizations proved to be both necessary and problematic. Figure 3 shows a simplified "normal" C2 structure of a military operation involving air mobility. Compare this with figure 4, which describes the air mobility C2 structure in Haiti.

While the C2 structure was not optimal or greatly efficient, General Keen, along with leaders of AMC, NORTHCOM, and USTRANSCOM, were able to capitalize on expertise and capabilities within the system to overcome the inherent and created flaws in the C2 structure of Operation UNIFIED RESPONSE.

[11] Wallwork, 20.

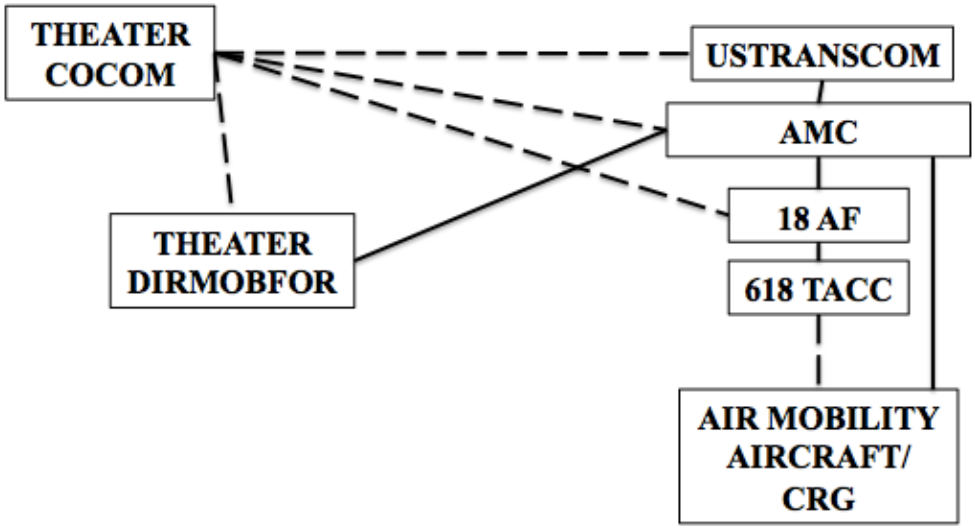

Figure 3. Simplified and Typical C2 Structure for Air Mobility Ops

Source: Author's own work

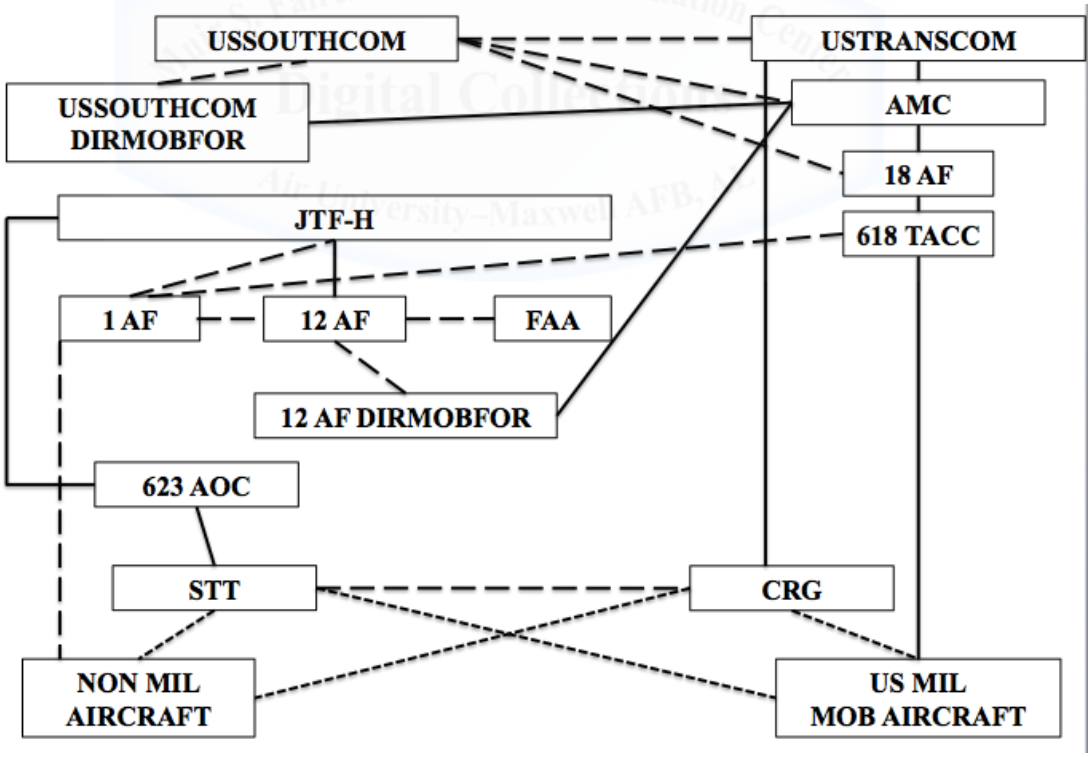

Figure 4. Simplified Relief C2 Structure for Air Mobility Ops

Source: Author's Own Work.

Resources

One simplified definition of strategy is *the most advantageous use of available resources to meet a defined objective*. Therefore, when conducting a major air mobility disaster relief operation, a thorough understanding of available resources is paramount to maximizing both effectiveness and efficiency. It is a mistake to view air mobility simply as a fleet of cargo aircraft and aircrew.

In the modern air mobility enterprise, decision makers have more, better trained, and better equipped resources available now than at any time in airlift history. The US Air Force Expeditionary Center (EC), located at Joint Base McGuire-Dix-Lakehurst prominently displays the slogan, "Air Mobility from the Ground Up" on the entryway marquee of its headquarters building. A large part of the EC mission is to train the USAF's ground-based mobility expert enablers, without whom it would be difficult to envision the air mobility mission succeeding in any expeditionary or contingency capacity. Among the EC's students are future contingency response (CR) specialists. CR personnel come from a litany of air mobility career fields in order to provide AMC with alert-ready and deployable mobility teams that can respond rapidly to a contingency and provide COCOMs with the ability to set up an air mobility hub or APOD in a matter of minutes. This game-changing capability does not exist elsewhere in the DoD.

Civilian contract carriers present another non-traditional resource available to air mobility decision makers. The 18th AF has the ability to contract out individual aircraft from commercial companies on a limited scale, or it can activate the Civil Reserve Air Fleet (CRAF). The CRAF is a program designed around a prearranged and phased approach that grants authority to task of dozens of civilian aircraft in an emergency situation when TRANSCOM air cargo capacity is exceeded and the need to push DoD cargo is deemed extreme enough to activate the CRAF.

In the Haiti response, SOUTHCOM reached initially to the 1st Special Operations Wing (SOW) to take air traffic control of the TLI airport. Combat controllers have extensive experience in controlling aircraft, including cargo aircraft, in austere and extreme environments. In Haiti, they did an outstanding job of responding extremely quickly to the need and opening a forward airfield within a very short period of time. However, this is where the STT's lack of expertise in air mobility operations was highlighted and effectiveness and efficiency suffered as a result. An STT operation with air mobility aircraft is often conducted in an environment where one or more thorough pre-planning and coordination sessions have occurred. These planning sessions allow air mobility-minded professionals to provide input into the STT's control plan. Air mobility operations must be envisioned throughout an operation from the view of the cargo movement, not simply the aircraft vessel. STT personnel did a commendable job at controlling and understanding the aircraft environment, but were quickly overwhelmed when faced with the needs and limitations of the associated cargo operations, which are the lifeblood of air mobility.

CR experts arrived in Haiti as part of TRANSCOM's JTF-PO mission to repair and reopen the destroyed Haitian seaport. When CR teams began work at the airport, they had to "undo" a lot that the STT controllers had done. Once mobility-minded professionals took control of the situation at TLI, aircraft capacity doubled within 24 hours. CR teams understood the adage, "slow is smooth, smooth is fast". The STT controllers were able to bring in several aircraft successfully to the airport, but due to the lack of cargo handling knowledge, the parking apron and cargo areas quickly became chaotic, which bottle-necked operations. Had SOUTHCOM, or JTF-H, had a better understanding of mobility resources other than available, they could have reached out to the 18th AF sooner and coordinated for the CR teams to activate and take control of the airfield earlier and enable much more cargo throughput,

which was the ultimate goal in Haiti in the first several hours of the response.

Infrastructure

Infrastructure is arguably the most crucial aspect of modern air mobility planning. The USAF has the unparalleled ability to provide strategic air mobility to anywhere in the world in an unrivalled capacity. Furthermore, AMC has garnered an exquisite reputation of timeliness and dependability for theater COCOMs, particularly in a crisis. General Mark Welsh, Air Force Chief of Staff, often brags about the air mobility enterprise. For example, he relayed his air planning interactions with other senior US officials recently, stating that "any time a plan comes up that requires getting US forces to anywhere on the planet, the question never comes up, 'how are we going to get them there?"[12] General Welsh implies that the US air mobility enterprise is so dependable that its capability is never called into question and is an assumed definitive in planning.

With the assumption that the 18th AF will meet the need of a COCOM, the next highest priority is infrastructure. First, aircraft-related infrastructure will be discussed, as it is the most obvious. Air mobility aircraft are very large and heavy. This creates a severe burden on the pavement of an airfield. Therefore, an airfield and parking area (both in terms of ground and pavement) must be strong enough to carry the load. This is known as weight bearing capacity or weight bearing capability (WBC). WBC is often the limiting factor when deciding whether or not air mobility aircraft can operate at an airfield at full weight, partial weight, or not at all. The next most common limiting factor is wingtip clearance. C-17s are the strategic backbone of the AMC fleet and they carry a 174-

[12] Welsh, Gen Mark A., (Air Force Chief of Staff) in discussion with author, 30 Aug 2013.

foot distance from wingtip to wingtip.[13] Additionally, many civilian contractors operate the Boeing 747 cargo aircraft, which measures just over 224 feet from wingtip to wingtip.[14] The wingtip clearance consideration often can inhibit operations at potential airfields, particularly smaller airports in underdeveloped countries.

For disaster relief operations, as was the case in Haiti, the obvious aircraft size and weight limitations, while a concern, were not the most critical factors. When air mobility, specifically in disaster relief, is viewed through the lens of logistics instead of aircraft, it reveals a necessary infrastructure that is not initially apparent. Delivering cargo to the destination is often the simplest part of air mobility operations. Once the aircraft is on the ground, particularly in a disaster zone, personnel must be ready to assist with taxiing, parking, and unloading the aircraft. This usually requires heavy machinery in the form of forklifts or K-loaders, specifically designed equipment to carry multiple pallets of cargo at one time. It is important to note that CR teams will often either bring their own forklifts, or have the ability to acquire them locally.

Again, once the cargo is off the aircraft, the work is far from complete. Logistics experts must assess the situation and decide how to store and disseminate the cargo in the most effective manner. All cargo is not created equal. Medical supplies, for example, carry special restrictions on how they must be stored and transported; otherwise they will be useless to the user. Other special cargo may have temperature or storage restrictions. Air mobility enterprise experts have the task of getting the cargo from the airfield to the cargo yard while respecting (and abiding by) the necessary limitations.

In Haiti, as mentioned, controllers did an admirable job getting aircraft on the ground. What to do with the large body aircraft once they

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[13] Air Force Technical Order 1-C-17A-1, *Flight Manual: USAF Series C-17A Aircraft,* 15 Oct 2008.
[14] Boeing, "747-8 Design Highlights"

were on the ground was another issue. Cargo handling, storage, and distribution, if thought of at all, were low priority. Disaster relief operations, much the same as any air mobility operation, must be focused on the cargo at least as much as the aircraft, if not more. In a sense, in disaster relief, planning should begin at the distribution point on the airfield and work backwards to the aircraft, identifying limitations along the way.

Air mobility has inherent restrictions due to the challenge of bringing massive aircraft into austere locations. Further, the cargo is the mission. The plan must focus on the cargo and its supply chain system instead of just the aircraft. The Haiti case served as an excellent example of juxtaposition between two groups: one, the CRG, with men who understood air mobility, and second, the STT, who did not. The infrastructure is not always ideal for large-scale mobility operations. In disaster relief, substandard infrastructure is highly likely. The air mobility infrastructure in Haiti was non-existent at the beginning of the relief operation. However, the STT, CR teams, and logisticians were able to overcome inherent limitations that occur in disasters and were able to establish a flourishing cargo operation at TLI.

Figure 5. Aerial View of Air Mobility Operations at TLI
Source: USSOUTHCOM

Political Implications

Disaster relief operations are multi-national events. Haiti was no different. Dozens of countries participated in the relief. In many Humanitarian Assistance / Disaster Relief (HADR) endeavors, operational commanders cannot overlook, but rather must remain sensitive, to the needs and perspectives of the host nation leaders. The disastrous quake in Haiti virtually wiped out the UN presence in Port-au-Prince. Normally, the UN would have taken the lead in the relief, but in this case, the lack of UN presence, as well as the geographical proximity of the US, led to a non-standard relief operation. An agreement was quickly reached that the UN would maintain a policing presence on the ground, but the US would lead the relief operation due to its overwhelming capability advantage and location relative to Haiti.

Choosing the US as lead nation was a gamble, but it paid off. International pressure to participate and provide relief is enormous. There were two main effects of political considerations in Haiti. First was the perceived need to participate by the international community, particularly at TLI airport. Second was the consideration for proximate nations to the disaster.

In a disaster such as the Haiti earthquake, “the CNN effect” can have severe implications for the response operation. The CNN effect involves the reaction by any actor or population to international media coverage of an event. In Haiti, television camera crews were present on the ground at TLI covering the air operations. The international media often showed video clips of aircraft landing at TLI and unloading cargo on the small ramp. The intended effect of the media was to show the high pace of the operation on such a limited amount of real estate. International actors, however, viewed the media coverage as a chance to advertise their country’s participation to the world. In Haiti, the best form of advertisement was to have an aircraft with the participant’s flag

on the tail prominently shown for the world to see. The need for international advertising had two major impacts on JTF-H air mobility operations, both affecting the scheduling of aircraft. First, it had an impact on slot time allocation. Second, it put controllers in an awkward and potentially dangerous position when international aircraft ignored instructions.

Again, the creation of a slot time system by the 601st AOC at Tyndall AFB was arguably the single-most helpful systematic effect on the operation pertaining to aircraft flow. The efficiency and effectiveness of JTF-H air mobility operations depended heavily on this slot system so that the airfield did not become bogged down, or worse, shut down due to too many aircraft on the ramp without the ability to move. As mentioned, authorities and C2 are fundamentally important, but there are limitations. JTF-H assigned the 601st AOC as coordinating authority for the air traffic into and out of TLI. International participants, by agreement, had to obtain a slot time from the HFOCC in order to land. If an aircraft arrived without a slot time, and many did, it was not given clearance to land and was instructed to proceed to an alternate airfield.[15] However, political will can sometimes trump systematic efficiency. In Haiti, there were multiple instances of international assistance aircraft arriving without slot time coordination. As per the agreement, the controllers would systematically deny landing clearance. The flight crew, however, was under orders from its home nation to deliver the aid and was therefore in a predicament. Often times, the aircraft would ignore controller instructions and land regardless. While the controllers and JTF-H had legitimate right to press the non-compliance up the chain to attempt to address the problem, the airfield personnel were aware

[15] 601st AOC members, in discussion with author 25 Sept 2015.

enough of the larger picture of disaster relief and accepted the anomalies as part of Clausewitz's fog of war.[16]

It was important to the international community not only to deliver aid, but also to do it in a manner that maximized the opportunity for "good press" coverage. As a result, when international countries contacted the HFOCC to obtain a slot time, they often insisted on daytime slot times so that their flag could be seen clearly on camera. Interestingly, the need for coverage outweighed the need to deliver aid. In other words, some nations would turn down night slot times, even if these slots were days later.[17] It was more important to get exposure than to get their supplies to Haiti as fast as possible. Refer to the picture at the beginning of this chapter. Note that there are zero USAF air mobility aircraft on the apron, but rather all international and civilian aircraft. This was an intentional act by the international parties involved to demonstrate the international response.

Political factors in the Haiti air mobility operation were not limited to those nations that sent aircraft and aid, but also to those nations adjacent to the affected host nation; specifically the Dominican Republic and Cuba. The overwhelming force of the US arsenal of airpower can sometimes test the nerves of smaller, underdeveloped countries. As discussed earlier, the ability to distribute cargo and aid with a damaged or non-existent infrastructure was a major hurdle and consideration for air planners. Per doctrine, airdrop, or aerial delivery (AD) is the go-to alternative for lack of infrastructure. Airdrop is the method of delivery in which large aircraft drop cargo pallets attached to parachutes. It is an excellent method to deliver cargo as close to the user as possible in a

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[16] Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 101.
Clausewitz's fog of war indicates the inherent confusion that he prescribes to accompany any form of warfare. It can be a result of lack of information, misinformation, or misperception, among others.

[17] Interview with 601st AOC members, 25 Sept 2015.

very short time. The downside to airdrop is risk. There is risk of injury, malfunction, and in Haiti, negative perception. Once AD operations began, there was immediate political backlash. The neighboring countries of The Dominican Republic and Cuba voiced concerns. AD is a method of delivery born in World War II to deliver a combat airborne division behind enemy lines. Through the decades, the primary purpose (although empirically not the majority of missions) of AD is airborne invasion. As countries that had been previously invaded by the US, both The Dominican Republic and Cuba were uncomfortable with large numbers of large US military aircraft flying low altitudes near their borders and conducting AD operations.[18] As a result, JTF-H terminated AD missions to Haiti, even at a potential cost to lives.

As can be seen, there are many political considerations that cannot be foreseen in any air mobility operation. Disaster relief operations are inherently politically charged and sensitive. Air mobility planners and decision makers must remain aware that civilian politicians or international actors may alter the most effective or efficient plan. The best to hope for is to develop alternative strategies to cope with these anomalies and accept them as part of the fog of war.

Conclusion

Haiti serves as an excellent case study of air mobility operations in disaster relief. It has many unique characteristics that highlight and test those concepts of a relief model. Being close to the US, and with military presence already on site, a very good understanding of the nature of the problem was possible. However, there was far from a complete understanding of the situation. This lack of a full comprehension of the nature of the problem by General Keen and SOUTHCOM led to critical space and weight being wasted and abused in the early stages of relief.

[18] Wallwork, 55.

Authorities and command and control will have a major impact on how an air mobility operation is conducted. In Haiti, the US was given a non-standard and large portion of the command and control system, specifically to the FAA and US military. The proximity to the US was a large factor in this outcome. Such a result cannot be counted on as normal. Most disaster relief does not occur so close to the US, and an understanding of authorities and command and control implications will go a long way in establishing and controlling air mobility operations elsewhere on the globe.

Using the most appropriate and available resources in air mobility is critical. JTF-H chose to reach out to AFSOC combat controllers because of familiarity and proximity. Just as ready were the CR teams in New Jersey or California. In the case of disaster relief, cargo operations and the logistics network are the lifeblood of the relief. The aircraft are the vehicles to deliver the aid. Had JTF-H had a better understanding of the capabilities and limitations of both the STTs and the CR teams, it is likely they would have opted for the CR mobility experts. This decision would have streamlined the cargo flow earlier and increased both efficiency and experts.

The CR capabilities are a direct response to inherent limitations in contingency air mobility operations. Often, when reacting to natural disasters, infrastructure is often damaged or destroyed. Leaders must have a thorough understanding of the available infrastructure in large logistics operations. While this thesis is concerned only with the air mobility-related infrastructure such as the runway, taxi areas, parking, personnel and equipment, storage and distribution areas, there is much more to cargo movement once it leaves the airfield. Many times, the infrastructure restrictions, either inherent or disaster-made, are the limiting factor in air mobility operations. Accounting for these limitations and providing viable alternatives is paramount.

Finally, the best-made plans often do not survive first contact with…politics. Clausewitz stresses that warfare and politics cannot be divorced.[19] The US military is subordinate to civilian leadership that often has political goals in mind that can run counter to the efficiency and effectiveness of cargo movement. Political implications are a naturally occurring phenomenon in disaster relief. Haiti was a prime example. The large response of the international community presented several challenges to JTF-H and controllers on the ground. While these implications cannot be specifically predicted, an awareness of the phenomenon through the understanding of a disaster relief model can prepare mobility operators to expect the unexpected political impact.

[19] Clausewitz, 87.

Chapter 4

Operation TOMODACHI

On March 11, 2011, a 9.0 magnitude earthquake occurred approximately 130km off the northeastern coast of the main Japanese island of Honshu.[1] The earthquake triggered a tsunami wave over 40 meters high directly toward the Japanese coast.[2] As a result, the tsunami left over 16,000 people dead and 5,000 injured.[3] It displaced an additional 131,000 Japanese citizens while destroying over 130,000 houses.[4] To further add to the catastrophe, the tsunami damaged the Fukushima Daiichi nuclear power plant, causing a fire outbreak in the four reactors.[5] The structural damage allowed radioactive material to escape the station and threaten not only the northern half of Japan, but also Alaska, Hawaii, and the western coast of the United States.

The Government of Japan (GoJ) named the earthquake as The Great Eastern Japanese Earthquake.[6] Almost immediately, there was an enormous international response and offers to assist. The GoJ retained host nation authority and asked the US for aid. The US tsunami response, Operation Tomodachi, undoubtedly delivered aid, reduced human suffering, and bolstered diplomatic relations between the two allied nations. The secondary but parallel objective was to evacuate US citizens off of Honshu and away from the nuclear danger. This

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[1] PACAF/13th AF/A9L, "Japan Earthquake and Tsunami Response: (Operation Tomodachi, Operation Pacific Passage Lessons and Observation Report". 29 July 2011, 1.
[2] Moroney, Jennifer D. P., Stephanie Pezard, Laurel E. Miller, Jeffrey Engstrom, and Abby Doll, *Lessons from Department of Defense Disaster Relief Efforts in the Asia Pacific Region*, (Santa Monica, CA: RAND, 2013), 85-86.
[3] Moroney, 88.
[4] Moroney, 85, 88.
[5] PACAF/13th AF/A9L, 1.
[6] Moroney, 86.

evacuation effort, Operation Pacific Passage, was led by the III Marine Expeditionary Force (MEF) and supported by Air Mobility Command aircraft.[7]

Operation Tomodachi presented many challenges to the US military, even those with extensive DR experience. The typical DR scenario involves a predominately US-led force responding to an underdeveloped region with limited host nation capability. Operation Tomodachi occurred in Japan, a highly developed country with considerable governmental and military capability. Many of these unique characteristics allow this research to discuss the attributes of the Japanese tsunami and derive similar themes across the range of the DR spectrum.

Nature of the Disaster

Operation Tomodachi was a tsunami assistance effort. On the surface, it should not have been especially difficult. For a large number of people on the US Pacific Command (PACOM) staff, disaster relief was not a new venture. The PACOM area of responsibility (AOR) is no stranger to natural disasters. A particularly volatile region of volcanic activity exists in the PACOM Theater known as the "Ring of Fire." Furthermore, COCOM staffs had the benefit of learning from their NORTHCOM and SOUTHCOM brethren during their relief effort of Haiti barely one year earlier.

The extensive experience among Pacific military forces both helped and hindered the initial response. The previous experiences of PACOM members helped lead to a relatively smooth initiation of the operation. However, Tomodachi ultimately deviated from how the expected pattern of relief operations look. The US response force fell back on their previous understanding and experience in relief operations. There were three significant differences in the nature of the situation and required

[7] PACAF/13th AF/A9L, 2.

response for Operation Tomodachi. First, the radiological environment provided an unusual problem set for natural disaster operations. Second, the highly developed nature of the host nation presented a framework that is rare to disaster relief. Lastly, and related, was the capacity and ability for the host nation to help itself and coherently request *specified* relief aid. This ability of the host nation had not been part of previous relief doctrine or experience.

The problems associated with the Fukushima Daiichi nuclear power plant caused the most difficulties for US responders. Major General Brooks Bash, Vice Commander of Pacific Air Forces, referred to the nuclear aspect of the response as the largest frustration he faced in the operation.[8] The nuclear radiation leakage from the damaged reactors ultimately forced PACOM to establish a 50 nautical mile exclusion zone around the plant. The establishment of the exclusion zone substantially hindered operations into Sendai, the nearest mobility-capable airport to the tsunami's ground zero.

The Japanese government and military were able to provide extensive search and rescue, as well as relief capacity to its population. The GOJ mobilized 100,000 personnel, 500 fixed wing aircraft, and 60 ships to aid in the rescue and relief.[9] In most disaster relief operations, the host nation is virtually incapacitated and is entirely reliant on external capabilities. In Japan, the two primary deficiencies were airlift capacity and debris clearing. Communication infrastructure in Japan remained intact. The GOJ was able to communicate what needs and aid they required. This ability was foreign to US previous experience. The US government (USG) did not fully understand and capitalize how to conduct disaster response with this added capability. In some cases,

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[8] Bash, Maj Gen Brooks L. (former Vice Commander, Pacific Air Forces) interviewed by Mr. John Trifonovitch, PACAF/A9 and Mr. Steve Diamond, PACAF/HO, 15 April, 2011, 1.
[9] Moroney, 89.

supplies were shipped without receiving a request from the GOJ. Massive amounts of aid were sent to Japan with no requirement, leading to excess capacity as supplies were amassed and not used.[10] In some cases, especially in underdeveloped countries, it may be prudent to "lean forward" and ship supplies that are statistically likely to be needed. Many underdeveloped countries lack the communication or government infrastructure to request relief aid. In the case of Japan, however, the GOJ retained communication and administrative capabilities that negated the need to push supplies without a requirement. A better understanding of the decision and communication environment can help prevent this from occurring.

Authorities

Consistent with disaster relief doctrine, the GOJ retained ultimate authority over disaster relief response in Japan. This authority was not only their sovereign right but unlike some relief operations, and it was also the most efficacious. The GOJ is highly capable and prepared for natural disasters. They have extensive knowledge and experience in prepping for and responding to contingencies. In the case of the Great Eastern Japanese Earthquake, two vital capabilities that the GOJ was unable to meet were radiological damage expertise and debris clearing/airfield opening.[11] Additionally, the Japanese military had a gap in strategic airlift for international aid. The GOJ had dedicated the vast majority of their transport fleet to intra-nation operations.

Unlike most international relief operations, the GOJ was substantially restrictive on which nations and international organizations would be allowed to respond. Initially, 45 countries offered assistance, but Japan requested aid only from Australia, New Zealand, South Korea,

[10] PACAF/13th AF/A9L, 27.
[11] Moroney, 104.

and the US.[12] Normally, the UN is the lead international agency and coordinates directly with, and for, the host nation. In the Japan case, the UN sent a Disaster Assessment and Coordination Team (DACT), but only served in an advisory role.[13] The GOJ wanted to make it abundantly clear that they were still in full control of the disaster operation. The four nations requested reported directly to the GOJ for all relief issues. There was no international intermediary between the host nation and the supporting units.

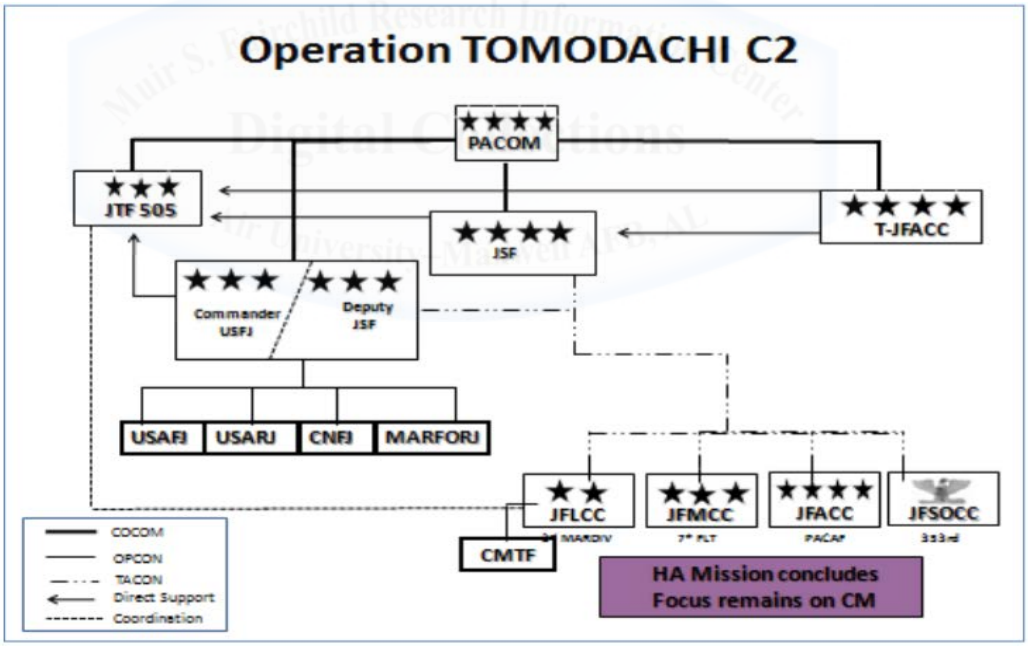
Command and Control

Natural disasters are often no-notice catastrophes. Furthermore, the nature and extent of the damage are unpredictable. As a consequence, it is unlikely to predict what the C2 structure should look like for any given relief operation. Operation Tomodachi was no different. To further complicate the issue, the US had already established a robust military presence throughout the island nation of Japan, comprised of all four US military branches.

The presence of both combatant commands and sub-unified commands only complicated the problem. PACOM, the combatant command, was the ultimate theater military authority. Additionally, PACOM has relatively substantial manning. US Forces Japan (USFJ) was the sub-unified command with theater authority within its boundaries but still subordinate to the combatant command. The presence of multiple commands presented some problems. First, PACOM had the manpower, capability, and authority to lead the military operation. However, USFJ had established relationships, expertise, and experience with the affected nation.

[12] Moroney, 89.
[13] Moroney, 89.

The eventual solution was to for PACOM to form a Joint Support Force (JSF) to lead the US effort, but USFJ remained the subject matter expert for coordination and planning. The reason for the creation of the JSF was to take advantage of planning expertise and provide additional workload capacity.[14] The US augmented the USFJ staff to facilitate the planning effort. Additionally, augmenting personnel joined with the 613th AOC. Many functions of the AOC, specifically Operations, Combat Plans, Air Mobility Division, and Airspace Operations worked out of Yakota Air Base (AB) on Honshu, as opposed to their home location of Hickam AFB, Hawaii.[15] Organizational C2 was functional, but the uniqueness and dislocation of the framework led to confusion and inherent inefficiencies.[16]



[14] Bash, 9.
[15] PACAF/13th AF/A9L, 24.
[16] PACAF/13th AF/A9L, ii.

Figure 6. Operation Tomodachi C2 Structure

Source: RAND

Another unique C2 challenge for the Japanese disaster was Operation Pacific Passage (OPP). OPP was an operation mandated by US government officials to provide voluntary airlift of American citizens and military dependents from Honshu. The III MEF was established as the lead DoD agency for OPP and JTF 505, the joint command for OPP. The III MEF's familiarity with the Japanese theater of operations was highly beneficial, as the III MEF is stationed in Okinawa, Japan.

The III MEF is trained and equipped as a quick-response force for crises and campaigns. OPP was the largest operation of its type since the 1991 volcano eruption and subsequent evacuation of Clark AFB in the Philippines. Although debates still linger as to whether or not it was necessary, OPP was an overwhelming operational success. The strategic confusion surrounding OPP is primarily attributed to a lack of full understanding of the radiological situation, as noted earlier. Nonetheless, JTF-505 chartered over 25 AMC strategic airlift flights and transferred thousands of American citizens away from a potentially catastrophic nuclear situation.

Operation Tomodachi and Operation Pacific Passage serve as perfect examples of the struggles and successes of establishing a C2 structure for disaster relief. Because disasters often suddenly occur unexpectedly, pre-established C2 is extremely difficult. In the case of Tomodachi, organizations and units banded together to form a "coalition of the willing" until PACOM created clear lines of authority.[17]

Resources

Operation Tomodachi highlighted four essential elements of resourcing that enabled a successful operation in Japan. First was

[17] PACAF/13th AF/A9L, 21.

appropriate staff manning. As discussed above, the staff organizations that had the most experience with Japan, such as USFJ, did not have the proper manning to plan and conduct relief operations without augmenting personnel. Fortunately, PACOM, PACAF, and the Air National Guard had the ability to forward deploy staff members so that the US could support planning and operations within the Japanese theater.

The second element was a group of mobility experts. Disaster relief is inherently air mobility-centric. Therefore, experts in air mobility are essential to get into the operation early and with adequate resources. The first mobility expert to consider is a Director of Mobility Forces (DIRMOBFOR). In fact, Major General Bash requested a DIRMOBFOR and staff forward as soon as possible.[18] There is a need for a DIRMOBFOR very early in a DR operation. The DIRMOBFOR and his or her staff have the mobility expertise to tie the theater mobility effort into the global mobility system.[19] Unfortunately, this is a lesson often repeated for disaster relief operations. DIRMOBFOR staffs contain the experience and expertise that are not organizationally inherent in the Air Mobility Divisions of AOCs. It is imperative for Air Component Commanders to recognize the capability gap and pre-position a DIRMOBFOR and staff as soon as a disaster relief operation becomes apparent in need.

The necessity of mobility experts did not end at the planning and coordination level. There was a need for mobility experts embedded in the relief organizations. Relief operations are dependent upon air mobility capabilities. The III MEF, tasked with evacuating over 5,000 American citizens, relied upon embedded mobility planners to plan and coordinate mobility operations effectively. Air Mobility Liaison Officers

[18] Bash, 4.
[19] PACAF/13th AF/A9L, 18.

(AMLOs) are ideal for this purpose and can prove invaluable in scenarios such as OPP. It was air mobility planners attached to the III MEF who put the airlift plan together for them.[20]

Third, Operation Tomodachi was able to resource the III MEF appropriately to add real value to the operation. The III MEF was tasked to fill a significant capability gap in the Japanese military. PACOM recognized the need to open Sendai airport as soon as possible to enable the flow of air mobility relief cargo into the heaviest affected region of northeast Japan's coastline. The III MEF's personnel and heavy equipment were resourced to remove the extensive debris and damage from Sendai airport.

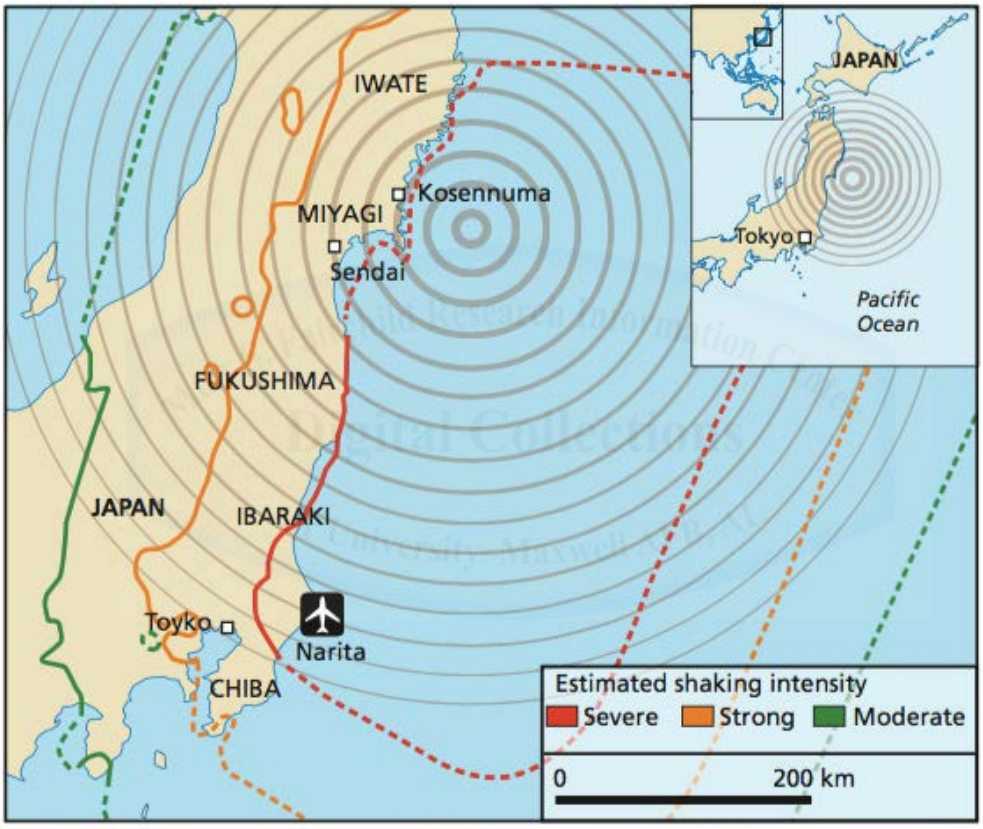
Lastly, PACOM lacked the radiological resources for a situation such as Operation Tomodachi. This piece was admitted to be the area of weakest knowledge and resourcing for PACOM. Naturally, PACOM first sought expertise from the US Navy's nuclear enterprise. PACOM believed that US Navy personnel would be a natural fit for the situation as they had extensive background and training in nuclear operations. However, PACOM failed to consider that US Navy nuclear personnel are trained to conduct nuclear operations on board a nuclear-powered vessel and have entirely different paradigms as how to respond to nuclear problems compared to nuclear power plant personnel. Eventually, PACOM was able to solicit expertise from multiple sources of US government and non-governmental nuclear experts. However, combatant commanders are better prepared if they have a more thorough understanding of their resources' limitations as well as their capabilities.

Infrastructure

The tsunami that led to Operation Tomodachi destroyed enormous amounts of the host nation's infrastructure. The effects and damage of

[20] Bash, 12.

the wave tore across most of Honshu, but the brunt of the blow was near Sendai. For relief operations, the natural "Catch-22" is that the majority of the infrastructure damage is also the area in most need of supplies, and, therefore, relies on infrastructure.



SOURCE: U.S. Geographical Survey (USGS), found in "Japan Earthquake: Tsunami Hits North-East," *BBC News*, March 11, 2011.

Figure 7. Great East Japan Earthquake Center Point

The tsunami destroyed over 2,000 roads, 56 bridges, and 26 railways.[21] Perhaps, most devastatingly, floodwaters had covered Sendai airport with an astonishing amount of debris that immediately closed the

[21] Moroney, 88.

airfield. PACOM staff planners faced a terrible situation. Supply lines could not access northeastern Japan via destroyed land infrastructure, the nearest suitable airfield was inaccessible due to debris, and leaking radiation prevented container ships from entering the damaged coast.

The best available option was to task the III MEF, located on Okinawa, to push northward and begin extensive debris clearing operations at Sendai airport. The III MEF made it possible to deliver much-needed relief supplies via air transport directly to the most affected areas. Within five days after the earthquake, the first fixed wing mobility transport was able to land at Sendai.[22] Air mobility crews shuttled critical supplies from Yakota AB, near Tokyo, to Sendai multiple times per day.

Figure 8. III MEF Conducting Debris-Clearing at Sendai Airport

Source: USPACOM

In Operation Tomodachi, the infrastructure was not limited to the surface. Airspace around the affected area was an important

[22] PACAF/13th AF/A9L, 7.

consideration for planners and responders. First, unlike much previous experience, the Japanese did not relinquish airspace control to the US. PACOM sent augmenting Air Force members from the 623rd Air Control Flight from Kadena AB and the 610th Air Control Flight from Misawa AB. These controllers worked side by side with Japanese controllers, but never took authority or control from the host nation.

An additional infrastructure consideration for the airspace was the nuclear exclusion zone. Ultimately, aircraft and surface vessels, unless specifically authorized, were restricted from entering a 50 nautical mile radius of the Fukushima Daiichi nuclear power plant due to the radiological threat. This restriction significantly hampered the proper flow of air mobility aircraft into and out of the hub of Yakota AB, which sat just south of the exclusion zone. Furthermore, the airspace created inefficiencies for air mobility because specialized medical teams had to test any aircraft that entered the exclusion zone for radiological contamination. The added inspection was a time-consuming process that added significant delays to each sortie into and out of an area that could ill afford any additional setbacks.

Political Implications

The response to the Great Eastern Japanese Earthquake was unique. The departure from international disaster relief occurred from the start. In typical relief operations, the host nation requests assistance from the UN. UN participants will then support UN operations with government organizations and NGOs. In Japan, the Japanese government did not seek direct aid from the UN but instead solicited support from specific individual nations. With the US being one of the requested nations, it placed the US in a political space that is atypical for responders. For the DoD, PACOM established a JSF that worked directly with the Japanese government for relief operations, bypassing the UN.

As discussed earlier, the Japanese government was fully intact and operational after the tsunami struck. Additionally, the Japanese military had full capabilities to conduct a major response to the disaster. Both of these conditions are unique to the US doctrine of disaster response. The US found itself unconditioned to playing a secondary role to the host nation's response.[23]

Another unique condition of the disaster operation was the US basing. Normally, an international disaster response is to an underdeveloped nation without US presence. In 2011, the tsunami struck a nation that was highly developed and had a large US military presence. This US basing further complicated political considerations. One major consideration was how to land foreign aircraft at a US base in support of the host nation, particularly when the aircraft was from a nation that Japan did not specifically request. This complication indicated that planners had not considered this scenario before. It further highlighted the complications of balancing the sovereignty of US military bases and authority with the sovereignty of the host nation's desires in a disaster relief operation.

Finally, there are the political sensitivities to consider with the host nation. For example, in Operation Tomodachi search and rescue operations of Japanese citizens were only authorized for the Japanese military. The US had to adjust to and respect the socio-political desires of the host nation, particularly with such culturally sensitive issues. The US cannot politically afford for host nations to perceive the US as taking over and violating the political sovereignty of the host nation.

Conclusion

Operation Tomodachi, as well as Operation Pacific Passage, serve as valuable case studies in disaster relief. The departure in Japan from

[23] Moroney, 88.

traditional DR operating procedures allows this research to understand the conditions and considerations to conduct disaster relief within the US military more efficiently. Bypassing international organizations at the host nation request presented specific political and authorization conditions to overcome. Further, Operation Tomodachi highlights the flexibility required to take full advantages of organizations within a relatively ad hoc command and control structure.

Perhaps the most valuable insight from Operation Tomodachi and Operation Pacific Passage is the critical need to resource the operation effectively, particularly with mobility experts. Disaster relief is enormously dependent upon air mobility, especially in the most critical early hours of the operation. Therefore, pushing a DIRMOBFOR and staff forward as soon as possible proves to be highly beneficial. Further, embedding action officer-level mobility experts within relief organizations has provided substantial mobility effectiveness and efficiency at the most critical times.

Infrastructure considerations proved to be somewhat unique to Operation Tomodachi. While runway clearing is not a new doctrine or capability, doing so under the threat of radiological contamination was new. Further, the exclusion zone around the Fukushima Daiichi plant presented enormous challenges for air and maritime mobility planners that were specifically unique to Operation Tomodachi.

Finally, US military commanders and relief organizations *must* better understand the nature and political environment of the operation. Japan served as a much-needed wake-up call for US responders. The US must consider each host nation as a unique scenario and cannot rely fully on previous experience or doctrine. Japan's substantial capabilities and sensitivity to sovereignty proved to be a challenge for US planners to overcome early in the operation so as not to cause political fallout or operational consternation at a critical time.

Relief operation planners and mobility experts can extract valuable lessons from Operation Tomodachi and Operation Pacific Passage. When viewed through the lens of these strategic and mobility considerations, a framework of questions and factors can take shape to improve the effectiveness of any given disaster relief operation.

Chapter 5

Conclusions

The Haiti earthquake and Great Eastern Japanese earthquake were natural disasters that caused horrific destruction upon the nations unfortunate enough to reside near the quake's center. The devastation to the civilizations and toll in human lives were nearly unimaginable. Given the catastrophic conditions and inherent confusing environment of the natural disaster aftermath, one can only deem the US and international response and relief efforts as successful. However, the purpose of this research is to look deeper into these two fundamentally different operations. In doing so, this paper sought to highlight elements that are common to both. These elements have been applied or addressed both appropriately and inappropriately in past operations. With a thorough comprehension of the proposed elements of this analysis, the US can continue to improve its disaster relief capabilities in both effectiveness and efficiency.

Through a deeper study of the events surrounding the Haiti and Tomodachi operations, this research proposed six core elements of Air Mobility's disaster relief theory. While these elements are an extraction of these two case studies, they are equally applicable to virtually any disaster relief operation, specifically when Air Mobility is a core function of the effort. The six elements for analysis are:

1. Nature of the Disaster
2. Authorities
3. Command and Control
4. Resources
5. Infrastructure
6. Political Implications

Nature of the Disaster

Understanding the operational environment may be the single most important element for military commanders in any conflict. Natural disaster relief is no different. While Haiti and Tomodachi were both earthquake disasters, the operational environments created by the earthquakes were entirely different. Therefore, a rigid model for natural disaster relief operations is counterproductive.

In Haiti, the most important characteristics of the nature of the situation were the loss of effective government, proximity to the United States, and lack of sufficient logistics infrastructure. These factors put the US in a lead position with more authority than normal. Further, the proximity to the US meant that enormous amounts of relief supplies could reach Haiti in a very short time, often less than a day. The vast amount of supplies, combined with a crippled logistics infrastructure, quickly led to ports that were severely backed up and often unable to deliver the supplies where needed.

In Japan, the capabilities and wishes of the Japanese government, along with the nuclear crisis at the Fukushima Daiichi plant, were the most significant considerations for the US military and airlift planners. The US had never responded to a natural disaster while battling a nuclear crisis. The presence of a second disaster, along with the lack of nuclear expertise in the operation, greatly hindered the relief operation to the tsunami victims.

Admittedly, it is impossible to predict and prepare for any disaster scenario to which the US may be asked to respond. However, these cases have demonstrated that there is no “one size fits all” approach. When disaster strikes, the US must determine the nature of the disaster scenario and the factors that either do or do not conform to the traditional view of US disaster relief. A thorough understanding of the non-traditional factors will greatly aid US leaders and military planners

in conducting the operation. Air mobility leaders must also be aware of these non-traditional factors and communicate to US leaders how the factors will affect the air mobility mission. Had US military leaders been better aware of these non-traditional factors, both strategic and operational adjustments could have been made to maximize the use of US air mobility forces while reducing any potential political friction points.

Authorities

When conducting disaster relief operations, the US normally assists the host nation as a supporting force to an organized international effort. Moreover, the United Nations is the default lead for world disaster relief. When the US approaches disaster relief, it visualizes this traditional model of the operation as a supporting unit to the UN. However, in both case studies presented in this research, the US faced an alternate framework that did not fall into the typical paradigm.

In Haiti, the national government ceded more authority than normal to the US. Several factors led to this decision. First, US military leaders were already present in Haiti when the earthquake struck. Haitian leadership felt that the US was best posed to assess and assist due to this first-hand knowledge. Second, the earthquake effectively decapitated the Haitian government and their communication capability. The earthquake destroyed key government buildings and infrastructure, and killed the two senior UN officials in Haiti. The Government of Haiti, without communication capabilities or UN representation present, reached out by messenger to the US to take the lead in assisting the relief.

In Japan, two major authority conditions resulted in a scenario that differed from typical US disaster response. First, the Government of Japan and its capabilities remained fully intact throughout the duration of the operation. The US is accustomed to swooping in as the largest force in an international coalition, able to shape and dictate how the

action will proceed. In this case, the Japanese government had no intention of ceding authority, only to request assistance based on Japanese priorities and under their authority. The second factor that was different from typical relief aid was that the Japanese government sought relief aid from a handful of specific countries rather than petitioning the UN. This type of request severely limited the role and authority of the UN. It further meant that the US, along with the other participating countries, reported directly to the Japanese government for relief matters instead of the UN.

In the two case studies, neither scenario led to an authority relationship that fell within the normal framework of US disaster relief. In fact, the two scenarios were on opposite ends of the spectrum of US authority. In Haiti, the US had a near-complete power to organize, control, and conduct relief operations. In Japan, the US was fully subjugated to the Government of Japan and its wishes.

There is often a tendency in the US military to prepare for the worst-case, unlimited war scenario. Therefore, when a limited conflict occurs, the US military can scale down and respond as required. While this approach may not always be optimal in traditional warfare, it has merit in disaster relief. If the US is prepared to conduct operations like the one in Haiti, it is not difficult to scale down and respond with limited assets in a supporting relationship to a host nation's functioning government. However, the US must also be aware that the authority relationship is a sliding scale and is often not exactly as it is in US exercises. Responding in contrast to the actual authorities given can be a political and operational disaster. Therefore, the US must understand the authority relationship as soon as possible so that military leaders can allocate the appropriate forces.

Command and Control

The US has a strategic advantage by positioning forces and staffs throughout the globe. This prepositioning structure allows the US to become intimately more familiar with each region, sub-region, or nation in which it has forces. By default of expertise, when problems arise in a specific area, those localized US commanders familiar with the region are best positioned to command the operation.

In disaster relief, however, the case studies highlighted problems that arose in regards to this prepositioning structure. In both case studies, the most appropriate commands were not manned for a large-scale humanitarian mobility operation. In Tomodachi, the presence of multiple commands presented problems. PACOM had the manpower, capability, and authority to lead the military operation, but USFJ had established relationships, expertise, and experience with the affected nation. In Haiti, the geographic separation between USSOUTHCOM and the 12th AF created friction, especially when attempting to integrate mobility expert liaisons into the operational planning staff.

In today's environment, it is unlikely that all commands and sub-unified commands will be fully staffed and well experienced in all types of military operations. Therefore, these case studies have demonstrated the need for military staffs to think through augmenting strategies. Further, combatant commanders must also mentally prepare for natural disasters that destroy or degrade sub-regional commanders' abilities to conduct operations. The nature of natural disasters is so unpredictable that commanders must exercise the worst-case command and control possibilities.

Resources

Through examining the case studies, the consideration of resources, specifically air mobility resources, is perhaps the most impactful. Combatant commanders cannot be complete experts in all types of combat and non-combat operations. Very few, if any, regional combatant commanders have much experience in air mobility operations. Natural disaster relief operations are inherently very mobility-centric. The case studies, along with their lessons learned reports, showed that getting mobility experts involved in the highest levels of operational planning as soon as possible was a necessity. The recommendations of this research cannot overemphasize this point. Organizing and coordinating a massive air logistics supply chain is a challenging undertaking. There exist many considerations, capabilities, and limitations in air mobility not readily apparent to the outside observer. As soon as operational military commanders are tasked with a natural disaster response, one of their first actions should be to coordinate for a DIRMOBFOR and staff as soon as possible. Next, if the planning staff does not contain mobility-minded planners, the commander should seek augmentation from other staffs.

Infrastructure

The review of the two cast studies highlighted one important lesson for infrastructure in disaster relief operations: the infrastructure likely will not exist. Commanders must be aware of the devastating effects that earthquakes and water have on logistical infrastructure. One vital consideration for commanders is to understand what infrastructure remains post-disaster; which, if any, air mobility assets can access the remaining ports; and how to open and access more air and seaports as soon as possible. In a normal non-combat operation, it is virtually unthinkable to rely on a single port for a major operation. In natural disaster relief, only a single port, or less, may be available. Operational

level planners must survey the situation to allow multiple ports of entry to the operation. This consideration ties closely with resources. Because nations are highly unlikely to have the capacity to reopen ports, the US must bring its own port opening resources. In Haiti, the JTF-PO was the perfect solution to reopen the seaport so the operation would receive critical large-scale deliveries of supplies. In Japan, the III MEF was crucial to the operation. PACOM was unable to access the northeastern part of Japan, which was the most in need of supply. Because the III MEF cleared the Sendai airport of extensive debris, relief supplies finally began to flow to those most in need of aid.

Political Implications

Natural disaster relief operations are political by nature. Military commanders must be aware that they are operating in an extremely complex environment when they respond to natural disasters. In most cases, the international community will participate in the operation. This alone creates tensions, as nations may have self-interest in mind when offering assistance. In Haiti, the politics at play during the large international response made coordinating air mobility aircraft more difficult. Additionally, the proximity of Haiti to its neighboring countries limited mobility planners in what they were allowed to do.

In Japan, the lack of UN participation immediately altered the environment from traditional disaster response. Further, the US had to accommodate for the prestige of the Japanese government. The Japanese government was fully operational and retained many capabilities to respond to its own population. Often, the US will control the operation because the host nation does not have the capacity to do so. In Japan, had the US not diverged from its DR doctrine, severe political fallout may have resulted.

Chapter 5

Conclusion

A major natural disaster will occur again. The US will be called upon, in some capacity, to assist and deliver relief aid. Air mobility will again be the primary form of transportation due to its flexibility, capability, and response time. Combatant commanders are often not experienced in major air mobility operations, especially in a degraded environment such as that after a natural disaster.

As a means to equip those commanders so that they may efficiently and effectively respond to those in desperate need, this research presents six considerations that, if understood and accommodated, will greatly enhance a disaster relief operation. First, commanders must understand the nature of the disaster to which they are responding. Second, they must understand their authorities and the relationships of their command with the US and international environment. Third, they must establish simple, effective, and coherent command and control networks that are tailored to the operation. Fourth, they must understand what resources are available to them to conduct an air mobility operation in their AOR. Once identified, mobility experts must be integrated into the decision cycle and operational planning as soon as possible. Fifth, they must survey the area of operation and determine what infrastructure remains, what air mobility aircraft can access the limited infrastructure, and how to create or reopen ports for supply. Lastly, they must understand that natural disaster response occurs in an inherently politically charged environment. Many decisions they will make may not be the best military decision. Rather, the potential political effects and implications will often drive military decisions away from the most effective or

efficient. It is up to the informed commander to minimize the negative operational effects.

This research does not present a specific prescriptive model or checklist for using air mobility in disaster relief. Natural disasters and their effects are far too unpredictable. However, commanders must be able to understand the scenario, adapt, and employ forces in the most effective and efficient manner possible. This research provides those considerations that will help military commanders to do so. General Bash highlighted the need for a flexible model such as presented in this paper. If applied, these concepts and considerations will no doubt aid military commanders and planners to reduce the devastating effects caused by natural disasters. As has been admitted, however, the list of considerations presented here is not complete. As the US continues to participate in international relief operations, future case studies will bring to light new factors that may demand additional considerations or refinement of this model research. In the meantime, an understanding of how these six considerations impact the employment of air mobility in disaster relief will go a long way to reducing the suffering of those devastated by unforeseen disasters.

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