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HARD DECISIONS FOR SOFT AEROSPACE POWER

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Master of Defence Studies

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HARD DECISIONS FOR SOFT AEROSPACE POWER

By Wing Commander D.S. Glasson

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ABSTRACT

The changing nature of international relations has seen military forces being increasingly involved in operations other than war, including Humanitarian and Disaster Relief (HADR) operations. Despite these changes, the corresponding changes of joint doctrine have not been reflected in aerospace doctrine. This paper highlights the increasing prevalence of air forces being employed in soft power roles and argues that more emphasis should be placed on HADR in aerospace doctrine.

Armed Forces contribute to soft power by demonstrating a nation's ability to project power and also by reinforcing foreign policy objectives through the demonstration of goodwill. HADR is an important way for a nation to contribute as a global citizen, allowing smaller nations to achieve greater international status. Air forces in particular play an important role in HADR operations. The aerospace characteristics of elevation, speed, reach and agility combine to provide an immediate and persistent response to global crises. The limitations of aircraft such as payload, support dependency, fragility and sensitivity to the environment must also be considered when employing air forces in these roles. This paper analyzes the contribution made by the Canadian aerospace functions of Command, Sense and Act supported by the enabling function of Shield. The effects of these functions are demonstrated through a case study on the response to Typhoon Haiyan in the Philippines and the lessons learned from these operations.

This paper also discusses the alternatives to air forces in HADR, such as other military forces and civilian options and determines the particular aspects of air forces that make them well suited to HADR operations. To be better prepared for future operations, this paper outlines the changes needed in aerospace doctrine in order to generate, sustain and plan for the future force.

INTRODUCTION

The last thirty years have seen a significant shift to the type of operations that a country's military forces conduct. The state versus state confrontations predominant in the early 20th Century such as the two world wars, Korea and Vietnam have been surpassed by more collaborative operations including peacekeeping, peace enforcement, humanitarian and disaster relief (HADR), and more recent experiences in irregular warfare. Nations strive to avoid using their military forces to flex their hard power, preferring diplomatic or softer approaches.

This change in the way military forces are employed has seen a paradigm shift in the very manner in which individual soldiers, sailors and air personnel approach their duties. It has led to changes in the tactics that direct them and the strategies in place to achieve state aims. Military theorists have championed and debated these changes in the literature. Some levels of joint and individual environment doctrine have accepted this change and adapted to ensure the right framework is in place to plan and prepare for future military engagement.

Traditional aerospace power doctrine emphasizes the hard power roles of air forces, focusing on kinetic aspects such as fighter, strike and bomber campaigns. There are however, important non-kinetic roles that air forces play. Over the last few years the global community has witnessed disasters such as the Boxing Day Tsunami, earthquakes in Pakistan, and Japan and most recently the typhoon in the Philippines. Air forces have been regularly called upon to perform non-kinetic roles as the first responders in the aftermath of such disasters and to assist in a myriad of other humanitarian causes. Whilst acknowledging the role of aerospace power in HADR, aerospace doctrine has done little to reflect the shift in importance of this growing area

of concern. Accordingly, this study will argue that more emphasis should be placed on Humanitarian and Disaster Relief in aerospace doctrine.

Methodology

In order to establish the current doctrinal environment, this paper will review the associated literature and military doctrine as it relates to soft power and HADR. In particular it will analyze the changes that have been made within aerospace power doctrine to reflect HADR operations. The foundation of this argument is that there is a shift from hard power towards soft power. Chapter 1 will chronicle how international relations have changed over the last century and the effect that has had on the changing nature of war. These changes have also been evident in the military postures of powers following the end of the Cold War. The 1980s saw countries such as Canada and Australia committing forces to peacekeeping and peace enforcement operations, a commitment that has continued to the present day. There are those, such as the neoconservatives within the United States, who would argue in favour of more assertive uses of military force. These factors will be analyzed to determine the changing nature of conflict and whether there is a trend towards the use of soft power in international politics.

Aerospace power is often viewed in the light of its ability to deliver hard power. Its unique ability to use reach, penetration and concentration of force have been notable in the air campaigns of Bomber Command in the Second World War, Operation Linebacker in the Vietnam War and the prosecution of “shock and awe” tactics against Iraq. This is the hard style of aerospace power advocated by early theorists such as Douhet and Trenchard and reinforced by modern strategists like Warden. There is however, a broader view of aerospace power held by

those like Billy Mitchell which encompasses soft as well as hard power.¹ It is not the aim of this paper to diminish the importance of hard aerospace power, particularly in its foremost duty in the defence of the nation. Chapter 2 will however highlight the broader view and the other avenues in which aerospace power can be used as a soft power to achieve national goals.

The role of aerospace power in HADR will be discussed in depth in Chapters 3 and 4 by detailing the characteristics and functions of aerospace power in HADR and lessons learned from recent experiences. The specialized role of aerospace power as a first responder and its ability to provide an immediate effect will be discussed in context with longer term participation. The effect of space power will also be discussed as an important but often overlooked element of HADR.

In order to fully understand the challenges facing aerospace power in HADR, Chapter 5 will detail a case study on the recent international response following Typhoon Haiyan in the Philippines in November 2013. This case study will detail the actions that air forces took and the problems faced in delivering much needed aid. The emergent issues provide a basis for addressing the factors for future operations and the need for doctrinal change.

Chapter 6 will determine whether air forces are best suited to conduct HADR operations. Are there alternative Non-Government Organisations (NGOs) or government agencies that can provide the same level of humanitarian assistance? Finally, this paper will accentuate the need for change in emphasis in aerospace power doctrine by discussing the product of such a change. Doctrine is at the very heart of the culture of aerospace power and determines the framework for the future direction of air forces. A fundamental change in doctrine affects planning, structure and command of air forces. This paper will show that changing emphasis on doctrine will allow

¹ David MacIsaac, "Voices from the Central Blue: The Aerospace Power Theorists," in Peter Paret, ed., *Makers of Modern Strategy from Machiavelli to the Nuclear Age* (Princeton: Princeton University Press, 1986), 624-647.

air forces to more realistically prepare, train and equip for future operations. A change in doctrine will also engender a change in the way in which air forces are viewed, an image that is more in line with national policy. By making hard choices about the importance of soft power roles such as HADR, air forces will be better shaped to meet the demands of a changing world.

Doctrine and Literature

Much has been written on the nature of the soft power of nations and indeed there are numerous articles on the use of armed forces in soft power roles. Certainly, Humanitarian and Disaster Relief is mentioned in many countries' aerospace power doctrine. However, the role of aerospace power in HADR operations has taken on a more significant role and this changing importance is not often featured in modern doctrine. This paper aims to address the gap in literature regarding the emphasis that should be placed on HADR in aerospace doctrine and the benefits that a change in doctrinal thinking will engender.

The term soft power was first mentioned in an article in the *Foreign Affairs* magazine in the 1990s by Joseph Nye, who has since authored a number of books and articles about soft power and world politics. He describes power as the “ability to alter the behaviour of others” through coercion, incentive or attraction. Sometimes referred to as the stick and the carrot approach, coercion can be exerted through the hard power of economic pressure or military force, whilst soft power relies on the attraction of a nation's culture, values and policies.² Coercive Diplomacy is described as the “threat of punishment for noncompliance that he will consider credible and potent enough to persuade him to comply with the demand.”³ Non-military

² Joseph S. Nye, “Think Again Soft Power”, *Foreign Policy*, (23 February 2006), accessed 06 February 2014 , http://www.foreignpolicy.com/articles/2006/02/22/think_again_soft_power

³ Alexander L. George, "Coercive Diplomacy," *The Use of Force: Military Power and International Politics*. Ed. Robert J. Art and Kenneth Waltz (U.S.A.: Roman & Littlefield, Inc., 2004), 70.

coercion, military deterrence and the use of soft power are widely used in meeting foreign policy objectives. Soft power has three sources, consisting of the attractive nature of a country's culture, political values and foreign policies.⁴ There is certainly much literature and academic discussion about soft power and its increased role in world affairs.⁵

This change has had an effect on the employment of forces from the three military environments. A number of articles have been written about the effect of aerospace power as a soft power and the changing direction towards soft power. For instance, Canadian aerospace academic Richard Goette has written and spoken on the positive effects of soft aerospace power, arguing that it should be considered in conjunction with more traditional kinetic aerospace power.⁶ The change in direction of aerospace power is highlighted in the paper by Australian academic Sanu Kainikara, in which he argues the need for a review of the thinking of aerospace power to meet the changing requirements of world affairs.⁷ In 2005 the Canadian International Policy Statement noted a change in emphasis in international security from nations waging war against one another to peace operations and the impact on civilians.⁸ Moreover, academics are not the only ones engaged in this discourse.

As early as 1997 the Commandant of the United States Marine Corps (USMC) General Charles Krulak formulated the concept of the "Three Block War" highlighting the shift in world affairs and the challenge to marines who are increasingly providing humanitarian assistance

⁴ Joseph S. Nye, "Think Again Soft Power," *Foreign Affairs*, (23 February 2006).

⁵ Zbigniew Brzezinski, "From Hope to Audacity: Appraising Obama's Foreign Policy." *Foreign Affairs* (89, no. 1 January/February 2010); Craig Cohen, Joseph S. Nye Jr., Richard L. Armitage "A Smarter, More Secure America", Report by the *Smart Power Initiative*, Centre for Strategic and International Studies, (06 November 2007), accessed 17 March 2014, <http://csis.org/program/smart-power-initiative>; Bates Gill, & Yanzhong Huang, "Sources and limits of Chinese 'soft power'", *Survival: Global Politics and Strategy*, Volume 48, Issue 2, 2006, accessed 19 August 2014, http://www.tandfonline.com/doi/abs/10.1080/00396330600765377#.U_KcPJXNvIU

⁶ Richard Goette, "The Positive Psychological Effect of Aerospace Power," *RCAF Journal*, (Vol.1 No.1, Winter 2012), 82.

⁷ Sanu Kainikara, "A Fresh Look at Air Power Doctrine", Air Power Development Centre, (Canberra:ACT, 2008).

⁸ Canada, Department of Foreign Affairs and International Trade, *A Role of Pride and Influence in the World – Diplomacy, Canada's International Policy Statement*, (FR4-4/2005), 11.

alongside war fighting duties.⁹ This concept sparked much academic debate and, whilst not fully accepted as doctrine, began a process of doctrinal change within the USMC towards a greater understanding and acceptance of humanitarian roles in future operations.¹⁰

United States Joint Doctrine relating to Humanitarian and Disaster Relief has recently undergone a holistic review. The new Joint Publication, released in January 2014, changes the name to Foreign Humanitarian Assistance which is used as an “umbrella term” covering a range of humanitarian activities including disaster relief. The use of aerospace power in this joint environment is discussed, including specifics regarding mission planning for air forces.¹¹

In Canada, the shift to humanitarian operations was notably accepted with Chief of Defence Staff General Rick Hillier echoing the sentiments of the “three block war” in 2005.¹² Canadian Joint Doctrine and operational policy documents provide a focus on HADR, and define the types of operations that the Canadian Armed Force (CAF) will be involved in and numerous planning considerations. Chapter 10 of the *Canadian Armed Forces Operations* doctrine is devoted to Peace Support Operations and defines such operations and their conduct.¹³ Whilst these documents include reference to the aerospace environment, they do not focus specifically on aerospace power.

Australian Joint Doctrine follows a similar path to its Northern Hemisphere allies with Joint Doctrine defining Peace Operations and Humanitarian operations with focus on joint conduct of such missions.¹⁴ Whilst Joint Doctrine and associated operational policy documents have adapted to the change in emphasis on humanitarian operations, aerospace doctrine still

⁹ Walter Dorn, “Three Block War: A Critical Analysis”, Presentation, Canadian Forces College, (3 December 2007).

¹⁰ Dorn, Walter and Michael Varey, “The Rise and Demise of the “Three Block War””, *Canadian Military Journal*, (Vol. 10, No. 1, 2009), 39.

¹¹ United States, JP3-29 *Foreign Humanitarian Assistance*, (03 Jan 14), iii., III-13

¹² Dorn, Walter and Michael Varey, “The Rise and Demise of the “Three Block War””, *Canadian Military Journal*, (Vol. 10, No. 1, 2009), 39.

¹³ Canada, Department of National Defence, B-GJ-005-300/FP-000, *Canadian Forces Operations*, (Aug 2005), 10-1.

¹⁴ Australia, Australian Defence Doctrine Publication, ADDP 3.8 *Peace Operations*, (Canberra: December 2009).

needs to catch up. The United States, Canada, Britain, Australia and New Zealand, otherwise known as the five eyes defence community, treat aerospace power doctrine in their own individual style.¹⁵ Whilst the content and theory are very similar, certain definitions, format and indeed emphasis differ between these five countries. One commonality of these countries' aerospace power doctrine is the lack of emphasis on HADR.

The Royal Australian Air Force's *Australian Air Power Manual* classifies HADR as a non-warlike operation that forms part of the Shape and Deter elements of Australia's military strategy.¹⁶ The only other times humanitarian operations are mentioned are as examples of aerospace power's characteristic of penetration and reach. The *Air Power Manual* discussed the importance of Airspace Management in humanitarian operations but in no great detail.¹⁷ In addition to the main doctrine there are a number of subordinate publications relating to the Air Force's approach to Irregular Warfare, Logistics and Intelligence, Surveillance and Reconnaissance (ISR) but no such doctrinal publications relate to HADR.

Canadian Forces Aerospace Doctrine approaches HADR in a similar manner. Humanitarian assistance is briefly mentioned as an example of the aerospace power application of Support. The operational function Act (Move) defines Humanitarian-Relief Operations (HUMRO) and provides two examples of recent operations.¹⁸ Subordinate operational publications relating to electronic warfare, force protection and personnel have been developed but as yet there is no such doctrine focussing on HADR.

¹⁵ James Cox, "Canada and the Five Eyes Intelligence Community", *Strategic Studies Working Group Papers*, (Canadian Defence and Foreign Affairs Institute, December 2012), accessed 18 August 2014, <http://www.cdfai.org/PDF/Canada%20and%20the%20Five%20Eyes%20Intelligence%20Community.pdf>

¹⁶ Australia, Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2014), 27.

¹⁷ *Ibid*, 65, 123.

¹⁸ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 25, Operation Hestia and Operation Plateau described on pages 20 and 21.

The Royal Air Force's *Air and Space Power Doctrine* states that aerospace power is uniquely suited to "spearheading a humanitarian response" and highlights HADR as a strength of aerospace power in irregular warfare. The British doctrine further notes the importance of humanitarian assistance in irregular warfare but does not go into detail or place further emphasis on these important operations.¹⁹

United States Air Force Doctrine recently underwent a significant redevelopment that took three years to complete. This major change "redefined what aerospace power means" by placing greater emphasis on culture and irregular war.²⁰ Despite this change, the USAF Doctrine Document defines HADR and HUMRO but does not go into detail regarding the theory or conduct of such missions. Like Australia and Canada, the US air doctrine has also been amended to include Annexes dedicated to ISR, Irregular War and Medical Operations. Despite these additions, none address the particular requirements of HADR or HUMRO.

Despite the changing nature of international power and the evolution of armed forces conducting more humanitarian missions, aerospace power thinking is still dominated by kinetic operations. As a consequence, aerospace doctrine is lacking in detail and focus on soft power. This study will address this gap and indicate the benefits of updating doctrine to be more in line with current practice.

Defining HADR

Humanitarian and Disaster Relief or HADR, a term favoured in Australia, is called different things in various countries. For instance, Canadian Joint Doctrine defines Humanitarian Operations (HO) rather broadly as the use of the military to "to assist in the

¹⁹ United Kingdom, *British Air and Space Power Doctrine*, (AAP 3000, 4th Edition), 17, 59.

²⁰ Markeshia Ricks, "New Service Doctrine Redefines Aerospace Power", *Air Force Times*, (13 January 2014).

alleviation of human suffering.”²¹ US Doctrine uses the term Foreign Humanitarian Assistance (FHA) which is described as conducting operations outside of the US whose aim is to “directly relieve or reduce human suffering, disease, hunger, or privation.”²² These operations include Foreign Disaster Relief (FDR) and can be conducted simultaneously with other military operations.

Disaster Relief is a subset of HOs that follow the impact of a natural occurrence or human induced disaster that has had an impact on the population. These disasters range from floods to a building collapse. HOs are treated separately to Peace Support Operations (PSO) in that HOs are usually a limited operation that is primarily focussed on delivering humanitarian assistance, whereas Peace Operations or PSOs are focussed on establishing the conditions for “diplomatic, economic or humanitarian activities, ... and to transition from involvement.”²³ FHA is often performed in concurrence or support of other local and international agencies, including the United Nations (UN), North Atlantic Treaty Organisation (NATO), and Non-Government Organizations (NGO) in accord with the effort of the Host Nation (HN).

The Australian Defence doctrine also specifically includes support to domestic humanitarian assistance and disaster relief.²⁴ Military Forces can be used within their own country to support their own disaster relief efforts and they may additionally be required to seek assistance from other nations. By their inherent nature, military forces have the equipment, skills, structure and are prepared for rapid response, making them readily available to provide humanitarian assistance. This assistance can be through the direct action and assistance in “face-

²¹ Canada, Department of National Defence, B-GJ-005-300/FP-000, *Canadian Forces Operations*, (August 2005), 10-3.

²² United States, JP3-29 *Foreign Humanitarian Assistance*, (03 Jan 14), I-1.

²³ United States, JP3-03.7 *Peace Operations* (01 August 2012), I-7.

²⁴ Australia, Department of Defence Fact Sheet 9, Humanitarian Assistance and Disaster Relief, <http://www.defence.gov.au/header/factSheets/09..pdf>

to-face distribution of goods and services” or indirectly through supporting NGOs, agencies and other relief personnel.²⁵ Military forces can also contribute side by side to the efforts of other relief providers. There are three main phases of disaster response: the immediate live saving phase which includes “assessment, search and rescue, medical aid, delivery of water and emergency shelter,” the stabilization phase which continues life preserving operations and the recovery phase which aims to restore self-sufficiency and governance. In the longer term military forces can assist in the ongoing Development Assistance of a nation, by improving the infrastructure, training programs and generally ensuring the state has enhanced living conditions.²⁶

The UN describes a range of events that can lead to humanitarian assistance, including the displacement of people through the actions of “war, weather or natural disasters” as well as events that have had an effect on “health, hygiene, education, nutrition or basic shelter.”²⁷ The myriad of different events and circumstances leading to humanitarian assistance opens a wide array of the types of activities militaries can be used to provide support.

The increased emphasis of HADR has come about through changing international relations and the rise of soft power as a foreign policy tool. To establish the foundations of this change, Chapter 1 will describe the history of the move towards internationalism, modern theory and practice and the shift towards soft power.

²⁵ Canada, Department of National Defence, B-GJ-005-300/FP-000, *Canadian Forces Operations*, (August 2005), 10-3.

²⁶ *Ibid*, 1-5, 1-2.

²⁷ United Nations, Humanitarian and Disaster Relief Assistance, accessed 18 May 14, <http://www.un.org/en/globalissues/humanitarian/>

CHAPTER 1 - A SMART SHIFT TO SOFT POWER

Introduction

This chapter will discuss the changing international environment in order to determine the viability of the hard use of military power and the effectiveness of soft power as a foreign policy tool. The Director of the Strategic Studies Institute at the US Army War College makes the immoderate argument that “military force seems to fail as an instrument of policy and, as a consequence, it invites the view that it is becoming obsolescent and even anachronistic.”²⁸

Rather than being obsolete, this chapter will show that military power still has an important role to play in hard power as the stick, particularly in coercive diplomacy, and as an instrument of soft power as the carrot.

From Imperial to International Relations

It is clear that war is not a mere act of policy but a true political instrument, a continuation of political activity by other means.

-Karl von Clausewitz²⁹

When Clausewitz wrote his masterwork *On War* in the 1830s the world was a significantly different place than today. His concepts of absolute war and the importance of war as a political instrument are a product of, a time defined by empires and international rivalries. The end of the 19th Century and the beginning of the 20th Century heralded the height of the global influence of European empires. International relations were governed by the old system of diplomacy focused on the ambassador, who was usually the sole conduit of information and

²⁸ Douglas Lovelace Jnr in the Foreword to Colin S. Gray, “Hard Power and Soft Power: The Utility of Military Force as an Instrument of Policy in the 21st Century”, Strategic Studies Institute, (US Army War College, April 2011).

²⁹ Carl von Clausewitz, *On War*, Edited and translated by Michael Eliot Howard and Peter Paret, (Princeton University Press, 1976), Chapter 1, Section 24.

negotiation.³⁰ This old diplomatic system was shrouded in secrecy, leaving countries unclear about others' intentions and was where Clausewitz's use of war as a hard power tool of persuasion thrived.

The rivalry of the imperial era and old diplomacy culminated in the horror and devastation of the First World War. The change in the distribution of international power following that war was unprecedented, causing the major powers to accept a need for an international body to preserve peace and security. The League of Nations was the first international organization established with aims of safeguarding peace and to promote a radical change in the methods of international diplomacy.³¹ The distribution of power was changing throughout the world and during this time of transition from the old system to the new, the challenge of tackling world peace proved too much for this fledging global institution.³²

Following the Second World War the international community was again faced with the necessity of creating new institutions to meet the needs of the time. The United Nations (UN) was founded in San Francisco in 1945 with the UN Charter binding all signatory nations to the sentiment of its preamble to "save succeeding generations from the scourge of war, which twice in our lifetime has brought untold sorrow to mankind."³³ The UN Charter attempted to address the perceived shortcomings of the League of Nations and marked a profound change in diplomatic relations. In addition to changes in diplomacy, changes to the world economic system was also required, as a consequence the Breton Woods system was introduced.³⁴ The main power

³⁰ Karl J. Schmidt, "The League of Nations", *American History*, 2.

³¹ Ruba Zinati, "International Relations in the 21st Century", World Security Network, (03 October 2010, Internet Accessed 09 March 2014, <http://www.worldsecuritynetwork.com/Democracy-UN/ruba-zinati/International-Relations-in-the-21st-Century>;

Thomas J. Knock, *To End All Wars: Woodrow Wilson and the Quest for a New World Order* (New York: Oxford University Press, 1992), 36-7

³² Ruba Zinati, "International Relations in the 21st Century".

³³ United Nations, *Charter of the United Nations*, (26 June 1945), Preamble, 1.

³⁴ Ruba Zinati, "International Relations in the 21st Century".

holder in this structure was the United States, marking a transition from a multipolar system of international relations to a decidedly bi-polar system. It consisted of two ideologically-divided groupings, with the US and its NATO capitalist allies on one pole and the communist Soviet Bloc on the other. In this environment, international relations were dominated by the spectre of atomic weapons, leading to the long period of Cold War.

Cold War and Superpower

From 1945 until the fall of the communism in the early 1990s, the Cold War dominated international relations. The two superpowers, the USSR and the USA shared an overwhelming hegemon over their respective spheres of influence. Economically and militarily the USA dominated the west, while the USSR dominated the communist bloc politically and by military force. The communist pole had the added influence of an emerging China and its direct influences on neighbouring Asian states. The proliferation of nuclear weapons and the conventional arms race made the concept of an all-out war and its aftermath unthinkable. The threat of Mutually Assured Destruction by nuclear weapons created a level of stability at an international level.³⁵

Despite the lack of large state versus state conflicts, smaller more regionally focused confrontations were prevalent, sometimes fought vicariously by the superpowers. For the first time Europe experienced a long peace during the Cold War, while the “hot” wars occurred on the sidelines in Asia, Africa and the Middle East.³⁶ The world’s major armed forces were structured and equipped for Cold War scenarios, such as defence against a large scale invasion of Europe.

³⁵ John Lewis Gaddis, “International Relations Theory and the End of the Cold War,” *International Security* (Vol. 17, No. 3, Winter, 1992-1993).

³⁶ Andreas Wenger and Doron Zimmerman, *International Relations: From the Cold War to the Globalized World*, (Lynne Rienner Publishing: Boulder, 2003), 4.

The superpowers also structured their militaries to meet the challenges of the wars they were actually fighting, The US experience in Vietnam in the 1960s and the USSR in Afghanistan in the 1980s are but two examples that highlight the unsuccessful use of hard military power. Throughout this period US foreign policy was squarely aimed at containing communism through economic and military means.³⁷ The Soviet Union, unable to continue to fund such large forces, suffered economically. The radical economic reforms of *perestroika* and the openness of *glasnost* introduced in the 1990s led to the end of the Soviet era and with it the Cold War.

The fall of the Soviet Union transformed international relations in the late 20th Century, changing it from a bipolar system to one where the US as the sole superpower. Some theorists argue that the end of the Cold War not only changed the system but led to a major transformation of the system of international relations.³⁸ The initial dominance of the US and its unilateral approach made way for a new era of multilateralism. The importance of international consultation was evident in the events prior to the invasion of Iraq. The George H.W. Bush Administration, despite popular support at home, went to significant efforts to gain international support for its actions both through courting of allies for the “coalition of the willing” and through its efforts to gain United Nations sanction for the invasion.³⁹ There is a perception that despite having overwhelming power, nations should legitimize their actions on the world stage through recognized international institutions.

³⁷ Ruba Zinati, “International Relations in the 21st Century, World Security Network, (03 October 2010), Internet Accessed 09 March 2014, <http://www.worldsecuritynetwork.com/Democracy-UN/ruba-zinati/International-Relations-in-the-21st-Century>.

³⁸ K.J., Holsti “The Problem of Change in International Relations Theory”, *Institute of International Relations Working Paper No.26*, (Vancouver: The University of British Columbia, December 1998),3.

³⁹ Samuel J. Barkin, “The United Nations and Its System.” In *International Organization: Theories and Institutions*, (New York: Palgrave Macmillan, 2006), 57.

Modern Theory and Practice

International Relations theories follow three broad categories: realism, liberalism and idealism. Realists are concerned with the self-interest and the shifting power of states, liberals the emergence of democracies, while idealists acknowledge the changing nature of sovereignty, human rights and international justice.⁴⁰ Complimenting these theories is the concept of internationalism which favours a system of international institutions that encourage multinationalism and cooperation. It has been argued that the Obama Administration has shifted its attention to “comprehensively reconceptualise US foreign policy,” focussing on rebuilding relationships and confronting social and environmental dilemmas.⁴¹ This transformation has seen a much greater level of debate, cooperation and indeed use of the international organizations such as United Nations as a forum for resolving international dispute. This environment makes the unsanctioned use of hard power through military force unacceptable to the global community and increases the likelihood of international pressure and reprisals for such actions.⁴² Hard power is however not only concerned with the use of military force.

Hard power can also be asserted through punitive use of economic sanctions or trade embargoes in order to get another country to acquiesce to one’s demands. This has been notable in the UN Special Economic Measures Act (SEMA) which imposes trade restrictions on Iran following their recalcitrance over bans on nuclear weapons development. Recent events in the Ukraine further highlight the change from the use of the hard power of the military to a preference for internationalism and policies of coercion and attraction. US Secretary of State

⁴⁰ Jack Snyder, “One World Rival Theories”, *Foreign Policy*, (November/December 2004), 54.

⁴¹ Zbigniew Brzezinski, "From Hope to Audacity: Appraising Obama's Foreign Policy" *Foreign Affairs* (89, no. 1 January/February 2010), 17.

⁴² Ruba Zinati, “International Relations in the 21st Century, World Security Network, (03 October 2010), Internet Accessed 09 March 2014, <http://www.worldsecuritynetwork.com/Democracy-UN/ruba-zinati/International-Relations-in-the-21st-Century>.

John Kerry criticized Russia's heavy handed tactics in Ukraine stating "You just don't, in the 21st Century, behave in a 19th Century Fashion."⁴³ Despite this rhetoric and the threat of further sanctions, the US and Europe are steering well clear of hard military options.⁴⁴

Whilst the term soft power was only coined relatively recently, its use as a diplomatic tool has been well established. The most notable and effective example of the use of soft power was the US implementation of the post Second World War Marshall Plan. The Marshall Plan was introduced in 1947 to provide financial aid and assistance in rebuilding infrastructure of European nations devastated by the war.⁴⁵ This fostering of goodwill demonstrated a masterly use of soft power by ensuring the stability of these states and acting as a bastion against the rise of communism. Additionally, in 1950 a group of Commonwealth nations including Canada and Australia developed the Colombo Plan, which distributed bilateral aid to developing countries in South East Asia.⁴⁶ The Colombo Plan also used soft power by sponsoring Asian students to study at western universities in Australia and Canada. Whilst noble in its construct, this plan was specifically developed with the intention of using soft power to stop communism spreading throughout South East Asia and to help ensure involvement in every level of foreign policy, economic planning and cultural engagement.⁴⁷

To strengthen relationships in Asia, Australia has recently reinitiated a New Colombo Plan offering university exchange programs throughout the region.⁴⁸ Many nations' international aid programs are indivisibly linked to their foreign policy agendas. This was highlighted recently as the reason for the integration of the Canadian International Development Agency (CIDA) into

⁴³ David Von Drehle and Simon Shuster, "What Putin Wants", *Time*, (17 March 2014), 17.

⁴⁴ *Ibid*, 17.

⁴⁵ Lael Brainard, "The Lessons of the Marshall Plan", *Brookings Institution Press*, (04 June 2007)

⁴⁶ Australia, Australian Government, *Australia and the Colombo Plan 1949-1957*, (ACT: Department of Foreign Affairs and Trade, 23 May 2005)

⁴⁷ *Ibid*.

⁴⁸ Australia, Australian Government, *About the New Colombo Plan*, (ACT: Department of Foreign Affairs and Trade).

the Department of Foreign Affairs, Trade and Development⁴⁹ and in the southern hemisphere when Australia's equivalent, AusAID was subsumed into the Department of Foreign Affairs and Trade.⁵⁰

The use of soft power as a foreign policy tool has its critics. Certainly advocates of the use of hard power, such as the US neoconservatives, believe that the measure of a great power is its willingness to use that power, particularly through global military involvement.⁵¹ Neocons hold the view that soft power does not achieve foreign policy aims and that there is no threat in coercive diplomacy if the state is not willing to, or indeed perceived to be willing to, back up threats with action.⁵² Notably, neocons held key positions during the George W. Bush administration and were instrumental in the strategy to use military force to achieve regime change in Iraq in 2003.⁵³ At the time US Secretary of Defense Donald Rumsfeld claimed he did not even know the meaning of soft power.⁵⁴ The use of hard power in this way has proved an expensive undertaking and dented the US's image around the world. Following the Global Financial Crisis and subsequent recessed economies, reliance on hard power has proved difficult and too expensive for many countries to maintain. There are resounding calls from both sides of politics stating that the US can no longer afford to be the world's policeman.⁵⁵

Other critics of soft power claim that it is very difficult for a state to engineer the outcomes or reactions through attractions and subtle influences. China for example has embarked on enterprises to increase its soft power through expansion of news media and Confucius

⁴⁹ Stephanie Levitz, "CIDA Closed: International Aid Agency Merged With Foreign Affairs", *The Canadian Press*, (21 March 2013)

⁵⁰ Noel Towell, "DFAT-AusAid merger details to come next year", *The Canberra Times*, (21 November 2013)

⁵¹ Jack Hunter, "What's a Neoconservative?", *The American Conservative*, (23 June 2011).

⁵² Ibid.

⁵³ Joshua Micah Marshall, "Remaking the World: Bush and the Neoconservatives", *Foreign Affairs*, (November 2003)

⁵⁴ Joseph S. Nye, "Think Again Soft Power", *Foreign Affairs*, (23 February 2006)

⁵⁵ Geoffrey Garrett, "World's policeman turns in the badge", *Sydney Morning Herald*, (30 March 2011)

Academies but with little tangible results.⁵⁶ Soft power in this regard is viewed as too subtle a tool to wield effectively to achieve direct results. The influences of such soft power may not be felt for a considerable period of time.

Robert Kagan famously quoted that “Americans are from Mars and Europeans are from Venus,” indicating the preference of one for soft power and the other for hard power.⁵⁷ Indeed, Europe has successfully used its political and economic affiliation to attract new entrants and achieve its aims, while the US has been criticized for relying too heavily on the big stick of economic and military power. Joseph Nye argues that “it is a mistake to rely on hard or soft power alone;”⁵⁸ instead there should be a mix of hard and soft power. Termed ‘smart power,’ this concept was developed by the Centre for Strategic and International Studies to counter the perception of the US relying too much on hard power. It argues that “complementing U.S. military and economic might with greater investments in soft power, America can build the framework it needs to tackle tough global challenges.”⁵⁹

While military force is often related to a country’s hard power, in this new world environment the military can play a greater part by contributing to smart power through a combination of softer roles. The next chapter will outline the many advantages of using military force as a soft power tool.

⁵⁶ Alex Lo, “Joseph Nye's soft power concept is lame”, *South China Morning Post*, (02 May 2013)

⁵⁷ Robert Kagan, *Of Paradise and Power: America and Europe in the New World Order*, (Knopf Doubleday Publishing Group, 18 December 2007)

⁵⁸ Joseph S. Nye, “Think Again Soft Power”, (*Foreign Affairs*, 23 February 2006)

⁵⁹ Craig Cohen, Joseph S. Nye Jr., Richard L. Armitage “A Smarter, More Secure America”, Report by the *Smart Power Initiative*, (Centre for Strategic and International Studies, 06 November 2007)

CHAPTER 2 - SMART USES FOR ARMED FORCES IN SOFT POWER

A country's armed forces are viewed and measured by their ability to conduct the hard power roles of deterrence, defensive or offensive action. The three military environments are however able to provide a nation with capabilities beyond traditional warfighting in operations other than war (OOTW). The Army, Navy and Air Force can contribute in a myriad of ways towards smart power, drawing on their own particular strengths developed with the intention of hard power employment to achieve soft power results. Often armed forces are the only agencies with the work force and equipment that are readily available to respond to unforeseen circumstances. This chapter will discuss the use of armed forces in soft power roles and highlight the benefits of promoting their use in these roles. In particular, this chapter will focus on aerospace power and the psychological effects of soft power. While there are a number of ways a nation can use the military for soft power aims, this chapter will focus on the demonstration of power and the demonstration of goodwill.

The Demonstration of Power

Soft power seeks to influence others through the attraction of a country's culture, political values and foreign policies.⁶⁰ One method a country can employ its military to achieve soft power is through the demonstration of the nation's strengths and achievements. This demonstration of power is more than just a flexing of muscles; it is providing an opportunity to show off the nation's technological advancement, wealth and ability to project power through its military. Naval forces have a particular knack for achieving this soft power goal. In the 1700s Britain was able to demonstrate its ability to reach the most remote and uncharted corners of

⁶⁰ Joseph S. Nye, "Think Again Soft Power", *Foreign Affairs*, (23 February 2006)

the earth through the might and skill of the Royal Navy. During that time many naturalist and scientific expeditions were undertaken utilizing naval ships which not only provided the means of transport but “flew the flag” all around the world, claiming pieces of land and opening trade routes.⁶¹

In a blatant demonstration of the US’s emerging power status, in 1907 President Theodore Roosevelt commissioned a fleet of US Navy ships to circumnavigate the globe. These ships were all painted in white and became known as the ‘Great White Fleet.’⁶² Today ships routinely sail into foreign ports, participate in local celebrations and hold cocktail parties for local diplomats and dignitaries. In October 2013, the Royal Australian Navy (RAN) conducted an International Fleet Review (IFR), inviting navies from around the world to participate. The highlight of the event was a fireworks and light show featuring ships and aircraft celebrating the service the navy has given over the last 100 years. In case the point was too subtle, coinciding with the IFR, the RAN hosted a Sea Power Conference with the aim of examining “contemporary utility of navies as tools of statecraft, from hard and soft power perspectives.”⁶³

Communist countries have often held annual armed forces parades demonstrating their army’s strength and prowess. North Korea favours this style for demonstrating their power, even using the occasion to unveil newly developed missile systems.⁶⁴ Military parades were initially a method of drilling battlefield manoeuvres but have now become a show of precision and prestige. One of the most recognized and visited tourist attractions in London is the Changing of the Guard at Buckingham Palace. Indeed, a recent survey following the 2012 Olympic Games in

⁶¹ Michael S. Reidy, Gary R. Kroll, and Erik M. Conway *Exploration and Science: Social Impact and Interaction*, Science and Society, (ABC-CLIO: Santa Barbara, 2007), 103.

⁶² Leah Averitt, “Chinese Hospital Ships and Soft Power”, *Semaphore*, Issue 3,(April 2011)

⁶³ Australia, Royal Australian Navy, RAN Sea Power Conference 2013, accessed 02 Apr 14 <http://www.navy.gov.au/ran-sea-power-conference-2013>

⁶⁴ Mark Fitzpatrick, “North Korean Proliferation Challenges: The Role of the European Union”, *Non-Proliferation Consortium Non-Proliferation Papers*, (No. 18, June 2012), 10.

London listed the UK as the world leader in soft power, acknowledging the importance of military tradition, pomp and ceremony in achieving this ranking.⁶⁵

Although often associated with their ability to produce shock and awe by the use of hard power in kinetic actions, air forces are also an important soft power tool. Sir Basil Liddell Hart described aerospace power as “above all, a psychological weapon” arguing that soldiers should not “underrate the importance of psychological factors in war.”⁶⁶ Like many military theorists, Liddell Hart is specifically referring to the demoralizing impact of the kinetic aspects of air power, the instilling of the overwhelming fear that the odds are against you.⁶⁷ While having a negative effect on one’s foes, the impact of the kinetic might of air power also has a positive effect on friendly force morale. The combination of the air power characteristics of perspective (elevation in Canadian doctrine), speed and reach allow aircraft to penetrate beyond the frontline, providing reassurance to even the most isolated forward fighting soldiers.⁶⁸

There are however many ways in which air power can contribute to soft and smart power goals. Indeed, many of the characteristics of aerospace power provide ideal means of demonstrating power. In particular, the aerospace characteristics of speed and reach can be effective smart power tools. Speed allows a country to react quickly to a situation and “provides a rapid response capability that can be projected over great distances” while reach is defined as the characteristic which shows that a nation can “projected globally, unimpeded by surface

⁶⁵ Tom Kelly, “Britain ousts the U.S. as world’s most influential nation: Country tops rankings for ‘soft power’”, *Daily Mail Online*, (18 November 2012)

⁶⁶ Major Jon Huss, USAF, “Exploiting the Psychological Effects of Airpower A Guide for the Operational Commander”, *Aerospace Power Journal*, (Winter 1999), accessed 05 May 2014, <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj99/win99/huss.htm>

⁶⁷ Ibid.

⁶⁸ Australia, Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2014), 150

features.”⁶⁹ The air power characteristics that produce penetration in kinetic operations can be exploited to a positive psychological advantage in softer roles.

Air displays are also an effective means of demonstrating a nation’s technological superiority and ability to project power. At the 1988 Air Show at RAAF Richmond, Australia, a USAF B-52, based in Guam, flew down, conducted a fly past and flew back to Guam without landing.⁷⁰ Much was made of the fact that the aircraft had operated non-stop from such a distance, the spectators naturally were suitably impressed. More than merely wowing the crowds, this demonstration gave a clear message that the US had the reach and ability to strike over long distances in the Asian region. Today air shows are largely commercial ventures, providing an opportunity for aviation corporations to display their wares but the opportunity for nations to display their aerospace power is still prevalent. At the Singapore Air Show in February 2014, whilst many countries took the opportunity to show off their latest aircraft, the US proved to be the predominant exhibitor. They kept open their trade displays for the public and providing 5 of the 13 flying demonstrations, utilizing its Pacific based units (plus one from Australia’s newly acquired US built F-18 Super Hornet).⁷¹ The public relations boost was tremendous and important for a superpower that is pivoting towards Asia.

Further demonstrating their prowess, many air forces maintain formation aerobatic teams that travel the world participating in flying shows. The RCAF Snowbirds, RAAF Roulettes, US Navy’s Blue Angels and USAF Thunderbirds are examples of precision formation display teams. These teams not only demonstrate air power at home but also abroad. Such displays highlight the ability of the nation’s air power, clearly emphasizing their professionalism, precision and skill.

⁶⁹ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 25.

⁷⁰ Author’s firsthand account of events, Bicentennial Air Show, RAAF Richmond 1988.

⁷¹ Matthew Merighi, “Jet-Powered Diplomacy Boosts the Rebalance, American Soft Power on Display at the Singapore Airshow”, *Real Clear Defense*, (19 February 2014).

Displays at air shows and precision formation aerobatic teams advertise and emphasize the nation's air power capabilities, providing a positive psychological effective on allies, while deterring would be aggressors.

Air Forces also provide a level of soft power to diplomatic missions. There can be no mistaking the importance of a visit by the US President when Air Force One touches down, providing an impressive backdrop for the arrival and initial media coverage, reminding all that the world's super power has come to visit. Notably, this provided an iconic setting to President Nixon's ground breaking visit to China in 1972.⁷² Controversially, the RCAF VIP aircraft fleet recently changed from a dull air superiority grey to a colour scheme that is more distinctly Canadian as depicted in Figure 1.



Figure 1 – New RCAF VIP Aircraft colour scheme.

Source - Meagan Fitzpatrick, "Stephen Harper's jet gets red, white and blue makeover" *CBC News*, (07 June 2013).

⁷² Kenneth T. Walsh, *Air Force One: A History of the Presidents and Their Planes*, New York: Hyperion, (14 May 2003), 98.

Demonstration of Goodwill

In addition to demonstrating a country's level of power, armed forces are able to contribute to smart power in soft ways through foreign policy objectives by demonstrations of goodwill. In the Vietnam War era this was described as winning the hearts and minds, ensuring that the image of the military was not only seen as belligerent but as the “good guys” who were there to help. The military is a valuable tool in demonstrating that a country is a good and contributing global citizen.

A most notable recent example of the use of the military to demonstrating goodwill is the search for the missing Malaysian Airlines Flight MH370. When the aircraft was initially reported missing in the Gulf of Thailand, six countries sent military maritime patrol aircraft and naval ships to search for the wreckage. Countries were eager to demonstrate their goodwill and certainly their military capabilities by assisting in the search. When the search area moved to the southern Indian Ocean some 26 countries had been involved in the search, the largest operation of its type.⁷³ By mid-March the visual search was based out of the RAAF Base in Pearce, Western Australia, attracting the attention of the world media and an unprecedented level of cooperation between nations within the region and beyond. The use of military soft power included surface and sub-surface naval vessels, military aircraft, satellite and radar installations.⁷⁴ The leadership taken by Australia in this soft power role is an important counterpoint to the harder policies of border protection further north in the Indian Ocean, an opportunity not missed by the Prime Minister as depicted in Figure 2.

⁷³ Yang Yi, “Unprecedented international search for missing flight MH370”, (Xinhua Net, 04 May 2014), accessed 05 May 14. http://news.xinhuanet.com/english/china/2014-05/04/c_133309270.htm

⁷⁴ Australia, Department of Defence News, “Defence supports search for aircraft”, *Defence News Online*, (23 March 2014), accessed 08 August <http://www.defence.gov.au/defencenews/stories/2014/mar/0323.htm>



Figure 2 – Singapore newspaper depicts Australian Prime Minister Tony Abbott with Chinese, Japanese and South Korean crews assisting in the search for MH370 in front of RAAF P3C Orion.

Source - “MH370 Lost in Indian Ocean, Day 24”, *New Straits Times*, Singapore, 31 March 2014

Indeed, while media attention can be positive in promoting soft power it can also prove to be a double edged sword. While the goodwill of nations participating in the search has been evident by the use of their latest military hardware and satellite technology, the failings of some nations’ militaries has also been detrimental to their soft power image. Notably, the lack of cohesion between the Malaysian Government and Military in the initial days has been seen as having a negative impact on the success of the search. Furthermore, the lack of reaction and failure to report the radar plot of the aircraft has drawn criticism of the professionalism and capability of the Royal Malaysian Air Force.⁷⁵ China has been one of the most visible nations contributing to the search with over 18 warships, 21 aircraft and 13 satellites involved. While

⁷⁵ Siva Govindasamy and Niluksi Koswanage “Malaysian military withheld radar data on Flight MH370 as nations searched wrong area, sources say”, *National Post*, (11 April 2014)
<http://news.nationalpost.com/2014/04/11/malaysian-military-withheld-radar-data-on-flight-mh370-as-nations-searched-wrong-area-sources-say/>

China has been universally praised for its commitment to the search, it has also exposed challenges to its ability to deploy naval forces on extended operations.⁷⁶

The use of a nation's military in soft power roles is especially important to middle powers. Canadian diplomat and academic Hume Wrong's functionalism principle argued that smaller nations achieve a greater status in international affairs based on three functions: relevance, contribution and capacity.⁷⁷ A smaller power has greater international effect if the issue at hand is relevant to the state's interests, the level of contribution the state is willing to make or has historically made and the capacity for the nation to participate in global affairs.⁷⁸ Canada has established itself as a middle power of some importance particularly in niche interests such as humanitarian affairs.⁷⁹ This status has come about through utilizing the functionalism principle, particularly through Canada's contribution and capacity to participate in peacekeeping and humanitarian missions. Similarly Australia plays a regional role that has been cemented through international cooperation and humanitarian assistance both regionally and internationally. Contribution on the international stage by use of the military in soft power roles ensures a state fulfils its duties as an international citizen and demonstrates two of Wrong's functionalities for gaining greater international status. As such, the contribution of a nation's military to humanitarian and disaster relief roles increases soft power, demonstrates goodwill, and reinforces important foreign policy issues.

Humanitarian assistance is also an important military soft power function of superpowers. The US Navy has two ships dedicated to humanitarian roles, the USNS *Mercy* and the USNS

⁷⁶ Greg Torode and Michael Martina, "Search for MH370 reveals a military vulnerability for China", Reuters, (22 April 2014), accessed 05 May 14, <http://www.reuters.com/article/2014/04/22/us-china-navy-idUSBREA3L1P120140422>

⁷⁷ Adam Chapnick, "The Canadian Middle Power Myth", *International Journal*, Vol. 55, No. 2 (Spring, 2000), 189

⁷⁸ *Ibid*, 189.

⁷⁹ Evan H. Potter, "Niche Diplomacy as Canadian Foreign Policy", *International Journal*, Vol. 52, No. 1, Canadian Foreign Policy (Sage Publications, Ltd, Winter, 1996/1997), 189.

Comfort. These ships are continually providing humanitarian support in South East Asia and Latin America. They are in such high demand that the USN has diverted \$250 million in funds specifically for aid and is planning to build more ships dedicated to humanitarian roles.⁸⁰

The delivery of soft power in humanitarian roles can also provide a hard edge. In response to the border conflict between Russia and Georgia in August 2008, President George W. Bush sent immediate humanitarian assistance to the region. This assistance consisted of a destroyer, the USS *McFaul* docking at an important strategic port and airlifted humanitarian supplies directly to the capital Tbilisi. In a further show of support NATO ships on exercise in the Black Sea provided a greater presence by moving closer to the Georgian coast. This demonstration of goodwill and strong message with a hard power edge was not lost on the Russian media who claimed “NATO’s navy delivers weapons to Georgia under the guise of humanitarian aid.”⁸¹ The use of soft power in this way has a significant psychological effect on the population that is being supported while having a negative effect on the belligerent.

Smart Uses of Armed Forces

The reinforcement of foreign policy objectives and the demonstration of power and goodwill are combined in the use of military in HADR operations. Not only can aerospace power have a particularly positive psychological effect; it can also achieve very real effects in HADR operations. The next chapter will describe how the unique characteristics of aerospace power contribute to these operations.

⁸⁰ Grace V. Jean, “Greater Demand for ‘Soft Power’ Reveals Shortfalls in The Navy”, *National Defense Magazine*, (March 2009).

⁸¹ “NATO’s navy delivers weapons to Georgia under the guise of humanitarian aid”, *Pravda*, (27 August 2008), accessed 10 May 14, http://english.pravda.ru/world/ussr/27-08-2008/106216-nato_georgia-0/

CHAPTER 3 - AEROSPACE POWER CHARACTERISTICS IN HADR

Introduction

Humanitarian and Disaster Relief operations cover a range of activities that are seemingly ongoing all around the world. The scope of these operations covers short notice emergency relief to long term assistance. We are often faced with news stories of hurricanes destroying villages, islands hit by storms, landslides or earthquakes devastating cities both rich and poor. In all of these tragic circumstances assistance can be provided in a number of formats. Often military forces are called upon to assist local and international agencies in providing aid. Aerospace power has characteristics and roles that are uniquely suited to such HADR operations. This chapter will define the contribution that the characteristics of aerospace power can make to HADR Operations. It will provide an analysis of the strengths and weaknesses of these characteristics, with illustrative examples of relevant recent experiences in HADR.

Aerospace covers the environment above the earth which “extends through the air into space.”⁸² Operations in support of HADR can take advantage of many of the unique characteristics that are experienced in the environment of both air and space. These characteristics of aerospace power can be exploited individually or in synergy with each other. The four characteristics of Elevation, Speed, Reach and Agility combine to provide an immediate and persistent response to global and regional HADR. There are, however also a number of characteristics that impose limitations on the ability of aerospace power to contribute to HADR.

⁸² Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 25.

Elevation

The characteristic of elevation is the capacity to take advantage of the greater perspective gained by the height above the earth's surface.⁸³ Elevation offers the ability to not only see further but to gain a greater understanding of the situation being faced. In HADR this provides a significant advantage as it allows a more detailed assessment of the effects of the disaster and the plight of the population. Often, affected areas are remote or cut off from regular outside contact necessitating the use of alternative methods of gaining information. Elevation also adds to the ability to provide communications within the affected area by utilizing “key communication nodes to ensure broad situational understanding across and beyond the theatre.”⁸⁴ Satellite imaging and communication facilities can be the only link to areas whose essential infrastructure has been destroyed. Elevation does have its limitations: a bird’s eye view of the area affected does not necessarily provide the level of detail that can be gained by those in closer proximity. Elevation can however, provide an important initial examination of the region.

The advantage of elevation was highlighted in the initial assessment of the devastation caused by the Tsunami on Boxing Day 2004. This tsunami was caused by an earthquake off the coast of Sumatra in Indonesia, the ensuing damage covered a vast geographic area around the Indian Ocean including Sri Lanka, India, Thailand, Malaysia and around to the Indonesian Archipelago. The initial assessment of the extent of the damage was difficult due to the widespread area and the destruction of communications infrastructure. Determining the worst affected areas requiring immediate assistance was impossible to ascertain without information supplied by imaging satellites. The satellite imagery was developed to compare large regional

⁸³ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 25

⁸⁴ Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2014), 132.

areas before and after the tsunami, this data was then analyzed and relayed to government relief agencies to focus their efforts.⁸⁵

Speed

The characteristic of speed “provides a rapid response capability that can be projected over great distances.”⁸⁶ This ability to cover vast distances quickly can provide assistance in HADR with minimal delay. In certain disasters the ability to react quickly and provide immediate aid can be critical. There are numerous HADR circumstances where speed can be the key to survivability. The prompt supply of water, shelter and medical treatment may literally be the difference between life and death. The element of speed often empowers air forces as the "first responders" in HADR operations. Aerospace power shoulders the initial responsibility of enabling operations with a high degree of urgency. Like many emergency services (ambulance, fire fighters) however, the assistance provided by first responders may be "lighter" than those that follow at a slower pace. A Boeing C-17 for example cruises at over 500 knots compared to a naval amphibious vessel cruising at a maximum speed of up to 22 knots.⁸⁷

The importance of speed in the initial response to HADR situations can be paramount. This is epitomized by the use of Urban Search and Rescue (USAR) following earthquake destruction of buildings in city areas. USAR teams are specially trained and have dedicated equipment with the capability to find, provide medical assistance, and extricate people who have been trapped by a structural collapse. It is imperative to find and rescue victims within the first

⁸⁵ Jay H. Samek, David L. Skole, and Walter Chomentowski, “Assessment of Impact of the December 26, 2004 Tsunami In Aceh Province Indonesia”, Center for Global Change and Earth Observations, (30 December 2004), 2.

⁸⁶ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 25.

⁸⁷ Colonel John Mayer, “31st Marine Expeditionary Unit, USMC in the Pacific”, Amphibious Operations Seminar, Royal United Services Institute of New South Wales, 27 May 2014.

days following the disaster. In response to the Christchurch Earthquake in February 2011 USAR teams were deployed from as far as the United Kingdom, United States, Japan, China, Taiwan, Singapore and Australia to assist the New Zealand authorities with the task of finding survivors under the rubble.⁸⁸ The use of air transport is the only way that these highly specialized personnel and equipment can be deployed within the window of opportunity to successfully perform the rescue operation.

Reach

The characteristic of reach is the ability of aerospace power to be “projected globally, unimpeded by surface features such as mountain barriers or water expanses.”⁸⁹ This characteristic offers nations the ability to assist in HADR operations throughout the world, broadening their ability to reinforce foreign policy objectives and spread soft power goals. The USAF claims to be the “only military force in the world which has the airlift and air refueling capability to provide immediate relief supplies and personnel in response to global emergencies.”⁹⁰ Despite this assertion there are a number of modern air forces that have the capability to provide long haul transportation of supplies, equipment and personnel to areas in crisis. In addition to providing the capability to project assistance globally, the characteristic of reach also allows delivery of assistance within the theatre of operations. Natural disasters can inhibit the use of road or sea transportation networks requiring the use of the third dimension to overcome these barriers.

⁸⁸ Stephen Glassey, “Analysis of urban search and rescue markings applied following the 22 February 2011 Christchurch earthquake”, Institute of Risk, Resilience & Renewal, University of Canterbury, *Journal of Search & Rescue*, Volume 1, Issue 1, (February 2013), 30.

⁸⁹ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 25.

⁹⁰ United States, Air Force Doctrine Document, AFDD 1, (05 June 2013), 29.

There are innumerable examples of the ability of aerospace power to project globally over vast distances but it is important to understand that reach also has advantages over shorter distances in overcoming ground obstacles. Nothing represents this characteristic better than the Berlin Airlift in 1948. In an attempt to place pressure on the allies occupying parts of West Berlin, the Soviets blockaded the land access to Berlin creating a shortage of food and supplies to the local population. In order to overcome this blockade, British, US, and Australian civil and military aircraft delivered an average of 8000 tons of food and supplies per day.⁹¹ This air bridge sustained West Berlin sufficiently until the Soviets lifted their blockade one year later.

Agility

Aerospace power has an ability to adapt and perform multi-role tasks with different platforms. Agility is described as a “blend of responsiveness, adaptability, flexibility, resilience and acuity.”⁹² Aircraft can conduct a number of aerospace power roles and have the flexibility to adapt from delivering one effect to another. Aerospace power can be a force multiplier, performing multi-role and swing role missions. Multi-role capability refers to the ability to conduct more than one role on a given mission, while swing role refers to the ability to change from performing one task to another.⁹³ For example, a C-130 Hercules delivering supplies can be re-tasked in flight to conduct a search and rescue mission. Furthermore, aircraft can be undertaking tasks in one theatre and then be replanned to conduct flights to different parts of the globe with minimal notice. This provides governments with a range of options to provide assistance and utilize air assets in a multitude of ways.

⁹¹ Australia. Australian Air Publication, AAP 1000-H, *The Australian Experience of Air Power*, (Canberra, ACT: Air Power Development Centre, 2013), 87.

⁹² United Kingdom, *British Air and Space Power Doctrine*, AAP 3000, (4th Edition, 2013) 17.

⁹³ Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2014), 138.

In a HADR operation this can have a number of advantages, allowing the use of minimum assets to conduct a variety of tasks. These characteristics of flexibility and responsiveness are summarized by Australian Boeing C-17 pilot Flight Lieutenant Luke Ridgeway:

One day we can be delivering supplies to the people of the Philippines, the next day an air drop in Central Australia. Then you can be involved in an international mission in South Sudan delivering vital supplies to people in need. The response on the ground has been amazing - big smiles when they see it's an Australian plane.⁹⁴

Aerospace power has the flexibility and responsiveness to conduct multiple mission types providing an important force multiplier function.

Limited Payload

One of the inherent weaknesses of aerospace power is the size and weight of the payload aircraft can carry, especially when compared to the capacity of land and sea vehicles. This is essentially a “trade off of load-carrying capability against speed, reach and security.”⁹⁵ Air forces can therefore provide the initial spearheaded response that may need to be backed up by a slower, heavier commitment provided by other military or civilian agencies. Despite being smaller, a payload delivered quickly to the right location “may be far more value in stabilizing a critical situation than a larger one deployed much later.”⁹⁶ Advances in aircraft and equipment loading characteristics have also allowed greater effects of the limited payload.

Canada and Australia's recent acquisition of the Boeing C-17 has significantly increased the payload capacity than the previous Lockheed C-130 airlift capability for a marginal increase

⁹⁴ Irene Scott “South Sudan crisis: Former ABC journalist Irene Scott travels with RAAF crew on relief mission”, ABC News, (16 January 2014), <http://www.abc.net.au/news/2014-01-16/former-abc-journalist-describes-south-sudan-situation/5201234>

⁹⁵ United Kingdom, *British Air and Space Power Doctrine*, AAP 3000, (4th Edition, 2013), 18.

⁹⁶ *Ibid*, 18.

in runway requirements. The C-17 has a maximum payload of 72, 727 kg, over three times as much capacity as the C-130J a maximum payload of 21,772kg.⁹⁷ The use of civilian cargo aircraft to deliver to a logistics hub can also increase the air lift capacity. These payloads however pale in comparison to the capacity of sea lift ships such as the USS *San Antonio*, a Landing Platform Dock (LPD) which can carry 54 times as much as the C-17 or the new Australian Canberra Class Landing Helicopter Dock (LHD) which takes as much as 400 C-17 loads.⁹⁸

Support Dependency

Another limitation of aerospace power is Support Dependency: the requirement to have a “high level of technical and logistical support that must be provided from a support base of operations.”⁹⁹ Aircraft require refueling, specialized loading equipment and maintenance servicing at a safe and secure facility. In addition to this, fixed wing aircraft require an airport with runways, taxiways and parking areas of sufficient size and capacity to support their operations. The requirement for this level of support may place additional burden on infrastructure already affected by disaster and supply chains struggling to meet the humanitarian needs. In this situation, it is paramount to determine the right balance and priority of logistics assets needs to be determined. The relative gains achieved by air support need to be weighed against the encumbrance of the footprint created by its inherent support dependency. There are however, a number of employment and delivery methods such as hub and spoke or “lily pads” (explained later in this chapter) that can shift the main support base away from the affected area.

⁹⁷ Royal Canadian Air Force, “Aircraft”, accessed 28 May 14, <http://www.rcaf-arc.forces.gc.ca/en/aircraft.page>

⁹⁸ Col John Mayer, “31st Marine Expeditionary Unit, USMC in the Pacific”, Amphibious Operations Seminar, Royal United Services Institute of New South Wales, 27 May 2014.

⁹⁹ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 26.

The trade-off between military logistics and security requirements versus humanitarian need attracted considerable criticism during the airlift support after the earthquake in Haiti in 2010. Doctors Without Borders and the UN World Food Programme claimed that most of the 200 flights coming into Haiti every day were carrying US military support and not the much needed humanitarian aid.¹⁰⁰ The limited capacity single runway at Haiti's main airport Jacmel also restricted the number of flights that were available to operate in and out of the area.

Fragility

In addition the high level of support dependency, air assets have a degree of fragility in that they are vulnerable due to the “sophisticated materials of which air platforms and technologically advanced systems are composed.”¹⁰¹ Put simply, aircraft and their systems have a tendency to break down, particularly when operated in austere and high tempo environments. Not only does this level of fragility add to the level of dependency on support, it also requires planning for sufficient redundancy measures to account for aircraft unserviceability.

Fragility can have the effect of diminishing the assistance effort but also the inability to provide relief can have a negative effect on a nation's image. In response to the crisis in Mali early in January 2013, Britain sent two Boeing C-17 aircraft to assist the French led relief effort. One of these aircraft became unserviceable due to a technical problem and was embarrassingly stuck on the runway in Paris for some time.¹⁰²

¹⁰⁰ Mark Weisbrot, “Haiti needs water, not occupation”, *The Guardian*, (21 January 2010).

¹⁰¹ Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2014), 144.

¹⁰² Alex Stevenson, “Red-faced? Mali-bound RAF aircraft breaks down in Paris”, politics.co.uk, (14 January 2013), accessed 26 May 14, <http://www.politics.co.uk/news/2013/01/14/red-faced-mali-bound-raf-aircraft-breaks-down-in-paris>

Sensitivity to Environmental Conditions

Aircraft and space platforms are especially affected by local environmental conditions.¹⁰³ Aircraft are limited by meteorological factors in which they can take off, fly through and land. Space imagery is also affected by basic changes such as the extent of cloud cover. This limitation may be particularly prevalent with inclement weather persisting after the occurrence of a natural disaster. Aerospace power may not be effective within the area until the climactic situation improves. Whilst this can also be said of land and sea assets, aerospace power is especially sensitive to these conditions. These sorts of deteriorating conditions led to the cessation of relief flights over Japan for periods in 2011 after the earthquake, as the visibility became too poor for helicopters to take off from their ships.¹⁰⁴

Aerospace Power Characteristics

This chapter has summarized the characteristics of aerospace power as they relate to HADR operations. The four characteristics of elevation, speed, reach and agility combined prove effective in these operations when the limitations are acknowledged and allowed for. These characteristics all form part of the operational and enabling functions of aerospace power which will be discussed in the next chapter.

¹⁰³ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 25.

¹⁰⁴ “Weather hampers U.S. relief flights over Japan”, *Navy Times*, (16 March 2011)

CHAPTER 4 - AEROSPACE POWER FUNCTIONS IN HADR

Introduction

Now that the characteristics of aerospace power in the performance of HADR operations have been analyzed, the actual roles or functions that air forces can contribute will be further discussed. The functions of aerospace power are the cycle of activities that are undertaken to conduct effective aerospace operations.¹⁰⁵ As shown in Figure 1, Canadian doctrine emphasized six core functions, three operational functions and three enabling functions. The operating functions consist of Command, Sense and Act, which is then broken into the sub-functions of Shape and Move.¹⁰⁶ The three enabling functions comprise Shield, Sustain and Generate. The contributions that the operational functions make to HADR will be analyzed individually. The contribution of the enabling functions to HADR will be further detailed in Chapter 6.



Figure 1: Canadian Aerospace Doctrine Functions

Source: Canada. Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, 35

¹⁰⁵ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 35.

¹⁰⁶ *Ibid*, 35.

Command

While British and Australian doctrine treat command as an enabling role, Canada establishes command as the primary and fundamental operational function of aerospace power.¹⁰⁷ The Command function is not unique to the air environment but has its own particular effects in the conduct of air operations. Command covers activities such as “planning, coordinating, allocating, tasking, executing and assessing air operations to accomplish assigned objectives.”¹⁰⁸ It is important to emphasize that HADR operations, like any other military activity, need to be conducted not in isolation but in collaboration with joint or combined commands. Command in HADR operations will invariably require the coordination and integration of not only military activity but a variety of government and non-government agencies. This is where command becomes paramount in the effective conduct of the air contribution to HADR. Without centralized command and control, the response and ongoing relief effort can be chaotic and dysfunctional. The most efficient and effective use of the air resources can only be achieved through the exercise of command across the strategic, operational and tactical levels.¹⁰⁹

Command is further divided into two important command and control missions, air campaigning and battlespace management. Air Campaigning covers planning, targeting and the execution of the air operation.¹¹⁰ Battlespace management includes a range of efforts to manage the airspace, the Electromagnetic Spectrum and the whole air and space environment.¹¹¹ In HADR operations every one of these command and control concepts require coordination with

¹⁰⁷ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 35

¹⁰⁸ United Kingdom, *British Air and Space Power Doctrine*, AAP 3000, (4th Edition, 2013), 61.

¹⁰⁹ Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2014), 80.

¹¹⁰ Targeting does not only refer to physical kinetic effects but the cognitive and information effects.

¹¹¹ Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2014), 83-85.

the host nation and civil coordination agencies. On an international level the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) is the body that provides oversight of all humanitarian assistance provided by the UN.¹¹² Other international bodies such as the North Atlantic Treaty Organization (NATO) have bodies such as the Civil Emergency Planning Committee who work towards coordinating international governments and NGOs in disaster and emergency response.¹¹³ An air force's contribution to the HADR response may be under the coordinating authority (as distinct from strict command and control) of such a body. The aerospace function of command in HADR operations must consider all levels of planning and interaction with national, international and host nation agencies.

Another function of command is the determination of the prioritized use of air assets. This requires an assessment of the need for supplies, equipment and specialist personnel and the determination of areas that necessitate specific aid. Command determines not only which aircraft to assign to specific tasks but a triage type allocation of the actual loading of aircraft. Experiences in the airlift in Haiti demonstrate the importance of planning aircraft movements, coordination with host nation and NGOs and appropriate prioritization of assets and space.¹¹⁴ Chapter 5 will further examine these issues and lessons learnt in the response to Hurricane Haiyan in the Philippines.

The challenges to command in an international HADR effort were faced in Sumatra following the Boxing Day Tsunami in 2004. The international community rushed to assist the stricken area, including a mix of civilian and military aircraft from all over the world. An Air Operations Centre (AOC) was established and Indonesian Air Traffic Control (ATC) was

¹¹² United Nations Office for the Coordination of Humanitarian Assistance, "Who we are", Accessed 31 May 14, <http://www.unocha.org/about-us/who-we-are>

¹¹³ North Atlantic Treaty Organisation, "Civil Emergency Planning", accessed 31 May 14, http://www.nato.int/cps/en/natolive/topics_49158.htm

¹¹⁴ Mark Weisbrot, "Haiti needs water, not occupation", *The Guardian*, (21 January 2010).

supplemented by RAAF personnel. Despite a combined effort to coordinate the aircraft movements, Medan and Banda Aceh airports were overwhelmed with air traffic often with “large aircraft just turning up” causing delays and a backlog of supplies clogging up the tarmac space.¹¹⁵

To ensure the most effective response to HADR situations, the function of command is vital in planning, assessing, decision making and direction of action. This function can however, only be successful if the appropriate information is available to feed into the command and control process.

Sense

The aerospace function of sense ensures that commanders and in some cases coordinating agencies are provided with the required knowledge to allow informed decision making.¹¹⁶ Sense delivers information through Intelligence, Reconnaissance and Surveillance (ISR) to achieve a level of situational awareness. In conventional warfare sense is typically considered to be providing analysis and information on the battlespace particularly the disposition and movement of opposing forces. Sense can be easily overlooked in HADR operations but plays an important role in determining the extent of damage, assessment of infrastructure and the whereabouts and movements of the affected population. The characteristic of perspective together with advanced technology make aerospace power uniquely suited to ISR in HADR. In a disaster zone a range of air assets including satellites, aircraft and unmanned aerial vehicles (UAV) can be utilized to search for survivors using visual, infrared or radar equipment.

¹¹⁵ Australia, “Humanitarian Assistance – Operation Sumatra Assist”, *Pathfinder*, Air Power Development Centre Bulletin (Issue 67, May 2007),.

¹¹⁶ Canada. Department of National Defence , B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 37.

ISR can also be an effective aerospace tool before the disaster occurs. Aerial imagery assets, satellites and atmospheric measuring equipment can be used to predict weather patterns or tidal activity, thus forewarning the affected areas and establishing the situational awareness for command decisions. The US Air Force was involved in assessing and tracking Hurricane Katrina before it made landfall. This information was used by the USAF to disperse aircraft from bases in the path. While this information led to some evacuations, the information passed on to civilian agencies was not adequately acted upon due to the insufficient mechanisms in place to cope with an evacuation on such a vast scale.¹¹⁷ After the hurricane had passed the USAF flew a total of 361 ISR sorties to assess the damage and determine the priorities for relief efforts.¹¹⁸

The importance of the aerospace function of sense in HADR operations should not be underestimated. In these situations, mechanisms to ensure the coordination of assessment and dissemination of ISR information to command or coordinating bodies should be established to ensure the appropriate decisions and response activities are made.

Act – Shape

The Act function consists of the sub-functions that Shape “the battlespace with kinetic and non-kinetic actions, and rapidly “moves” personnel and materiel.”¹¹⁹ It should be noted that although the roles that are included in shape are largely kinetic in nature, this definition includes the term non-kinetic actions. The roles that make up the function of shape are predominantly kinetic activities. Shape includes the aerospace power roles of control of the air, air attack and information operations. These roles invoke images of fast jet fighters or bombers in very

¹¹⁷ Daniel L. Haulman, “The US Air Force Response of Hurrigan Katrina”, USAF Media Document, (17 November 2006), Accessed 03 Jun 14, <http://www.afhra.af.mil/shared/media/document/AFD-070912-046.pdf>, 1.

¹¹⁸ Ibid, 10.

¹¹⁹ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 38.

aggressive manoeuvres involving munitions. Indeed, these kinetic operations may have a role as a precursor to HADR operations where there is a need to ameliorate a threat before assistance can be safely provided. There are times when humanitarian assistance needs to be provided as a direct result of conflict and in those times, the hard use of aerospace power may be necessary. Aircraft normally involved in control of the air or air attack, can also be used non-kinetically as a deterrent to potentially hostile forces.¹²⁰ Aerospace power has a crucial role in hostile environments but there are however, non-kinetic uses of the function of shape in HADR.

Information Operations (IO) can play an important non-kinetic role in HADR operations. IO covers a range of concepts including operations to “affect understanding and thereby perception and behaviour.”¹²¹ The influencing of the mindset and conceptual understanding of a population can have important implications in humanitarian operations. It is fundamental to the success of the operation that the local population understand that the air force is there to provide positive assistance, to help and not hinder. IO can also be useful to ensure that there is a level of trust and understanding with the civilian agencies in HADR. Known as Civil-Military Cooperation (CIMIC), it covers interaction with the local population, government bodies and NGOs.¹²²

This is a function that could be used to better advantage in HADR operations. The Pakistani military dropped 15,000 pamphlets in the remote areas near Larkana, warning of advancing flood waters and advising local inhabitants to seek higher ground.¹²³ This was one of the only ways that the information could be distributed to the villages within the required space

¹²⁰ United Kingdom, *British Air and Space Power Doctrine*, AAP 3000, (4th Edition, 2013), 17.

¹²¹ Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2014), 63.

¹²² Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 82.

¹²³ “Larkana: Army to air drop flood warning pamphlets”, *Dawn*, (11 August 2006), accessed 05 June 14 <http://www.dawn.com/news/205523/larkana-army-to-air-drop-flood-warning-pamphlets>

of time. Aircraft can be used to communicate the positive intent of the HADR operation and establish a level of trust with both the aid givers and receivers.

Act – Move

Arguably the most recognizable and often used form of aerospace power in HADR operations is the function of Move. Move is the use of air mobility to provide transport and delivery of personnel, equipment and supplies.¹²⁴ Move uses the characteristics of speed and reach to project aerospace power globally with local effect. Although inherently lighter than sea or ground transportation, air mobility can provide an important effect in HADR operations by providing practically immediate relief and aid. Air Mobility includes airlift and air to air refuelling, both providing advantages in soft power applications.¹²⁵ Airlift can be fixed wing or rotary wing transport, while air to air refuelling is the delivery of fuel from one aircraft to another whilst airborne.¹²⁶

The most common activity of the move function in HADR operations is Air Logistics Support (ALS) which covers the operations to deploy, distribute and retrieve personnel and materiel.¹²⁷ ALS provides air transport, both at a strategic level to the affected area and also at a tactical level within the theatre of HADR operations. There are a number of alternative applications of ALS that can be employed to alleviate the footprint and burden on affected areas and to overcome some of the limitations of payload capacity. Initially, strategic air lift of cargo and personnel may be delivered from an Aerial Port of Embarkation (APOE) through to an

¹²⁴ United Kingdom, *British Air and Space Power Doctrine*, AAP 3000, (4th Edition, 2013), 41.

¹²⁵ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 43.

¹²⁶ Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2014), 68.

¹²⁷ *Ibid*, 66.

Aerial Port of Disembarkation (APOD) outside of the affected area, flown to a terminal that serves as a logistics hub. This payload can then be flown by intra theatre airlift to a forward operating base (FOB) through a “Hub and Spoke” system as illustrated in Figure 1.¹²⁸ Such methods allow aircraft to be utilized in the role to which they are best suited: larger aircraft conducting strategic airlift and smaller aircraft or helicopters operating within the spokes. If sealift is utilized for the heavier bulk of the cargo, these airlift concepts also allow the facilitation of more efficient distribution from a central hub.



Figure 2 – Air Lift employment methods

Source - United States, Air Force Doctrine Document, AFDD 1, (05 June 2013), Annex 3-17 Air Mobility Operations, 50.

The situation on the ground may inhibit the use of airfields due to remoteness, damage or an unsecure environment. In this scenario helicopters or fixed wing aircraft can be used to airdrop supplies directly to the receiver site. Air to Air Refuelling provides the capability to extend the range of the receiver aircraft. This can be beneficial in HADR scenarios where the

¹²⁸ United States, Air Force Doctrine Document, AFDD 1, (05 June 2013), Annex 3-17 Air Mobility Operations, 50.

area is remote or if there are no “lily pad” airfields to allow intermediate stops on the way to the destination.

Another important mission within the Move function is the ability to provide Aeromedical Evacuation (AME). The HADR situation may often include injured or ill people who require treatment at a capable medical facility that is not established within the affected area. AME is a specialized capability that can be performed throughout the spectrum of air mobility aircraft, utilizing both fixed and rotary wing.¹²⁹ Air forces have the capability to deploy an Air Transportable Hospital (ATH) which is able to be quickly air lifted to the affected area. These fully self-supporting hospitals are furnished and staffed to conduct all-encompassing health support roles including surgical, general medical, pathology and environmental health. Before they are evacuated patients are prioritized and prepared for air transport by an aviation medicine qualified specialist at an Airfield Staging Facility (ASF).¹³⁰

One of the largest scale AMEs in peacetime was performed following the terrorist bombings in the Indonesian island of Bali in October 2002. The local hospitals were insufficiently facilitated to cope with the number casualties and the complexity of the medical care, especially burn injuries. These patients required treatment that was only available at specialist burns units in hospitals in Australia. The operation involved the “triage, stabilization and evacuation of 66 critically ill patients from Bali to Darwin over 21 hours.”¹³¹ Two RAAF C-130 Hercules with aeromedical evacuation teams consisting of a Medical Assessment Element (MAE) and a Fly Away Surgical Team (FAST), were sent within hours to Denpasar Airport in Bali. An ASF was established to prepare the patients for the flight, determine which facility they

¹²⁹ United Kingdom, *British Air and Space Power Doctrine*, AAP 3000, (4th Edition, 2013), 45.

¹³⁰ Australia, Australian Defence Force Publication, ADFP 1.2.3, *Casualty Evacuation and Patient Movement*, (Canberra: ACT, 2013), 1-26.

¹³¹ “The Australian Defence Force response to the Bali bombing, 12 October 2002”, ADF Health Journal, (Volume 4, April 2003)

needed to be flown to and the priority for the order of evacuation. The quick reaction and speed of this evacuation ensured 61 of these 66 most critical patients survived. Over the next few days, 5 RAAF C-130 aircraft with air force aeromedical teams together with special Boeing 767 flights operated by Qantas Airways, including fly away teams from CareFlight and the Ambulance Service of New South Wales continued to fly the more stable patients to Darwin and then onto more specialist facilities in Perth and Sydney.¹³² Crucially, the initial response teams were equipped with satellite phones and able to communicate directly with commanders at the headquarters in the rear echelon to relay the requirements of the ASF and coordinate the follow on response through the central coordinating agency, Emergency Management Australia, to ensure a synergy of effort between military and civilian resources.¹³³

This highly successful operation, conducted on a large scale, vanguarded by air force and coordinated with both military and civilian resources, demonstrates the importance of the aerospace characteristics of speed and reach and the functions of command, sense and air mobility.

Shield

The aerospace function of Shield is an enabling function of force protection that “minimizes the vulnerability of personnel, facilities, materiel, and information” to allow the freedom to conduct operations.¹³⁴ In the HADR environment the function of shield must also be applied to the local population to ensure that it is also afforded a level of protection. If the deployed forces are perceived to be “looking after themselves” then there is a risk of creating

¹³² “The Australian Defence Force response to the Bali bombing, 12 October 2002”, ADF Health Journal, (Volume 4, April 2003).

¹³³ Ibid.

¹³⁴ Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2014), 86.

mistrust among the populace.¹³⁵ The protection of the local population is paramount in HADR as it is the very function of why the operation is being undertaken in the first place.

HADR operations share many of the shield functions with conventional warfare but also have its own particular considerations. Aircraft are particularly vulnerable to the environment and need to be shielded from the elements to ensure they are serviceable to continue operations. Operations out of austere or damaged airfields increase the risk to aircraft, requiring HADR planners to consider methods of clearing runways, taxiways and providing safe areas for aircraft replenishment. Personnel must also be protected from hazardous environments, for in HADR areas there can be an increased threat of contamination or disease. Information security may not be as critical as in a warlike environment but the combination of the information and moral domains are important to ensure the HN population understand the reasons for the HADR operation and that negative reactions are not engendered. Unfortunately, the plight of the affected population can lead to looting, riots or attacks on HADR workers and their equipment. This issue caused particular problems in Somalia where aid groups were forced under threat of violence to hire “porters” affiliated with local militia to unload the aircraft; inevitably these porters were responsible for stealing a substantial proportion of the payload.¹³⁶ The appropriate level of physical security must be assessed to find a balance between protection and alienation.

Functions of Aerospace Power

The operational functions of Command, Sense and Act together with the enabling function of Shield provide a unique contribution to HADR operations. These functions combined

¹³⁵ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 45.

¹³⁶ Melissa Labonte, *Human Rights and Humanitarian Norms, Strategic Framing, and Intervention*, (New York: Routledge, 2013), 81.

with the characteristics of aerospace power are regularly employed on such operations. The international response to Typhoon Haiyan in the Philippines in 2013 demonstrated the real and psychological effects that aerospace power has on people affected by disaster. The next chapter will utilize this experience to study these effects and the lessons learned to improve future operations.

CHAPTER 5 - CASE STUDY: INTERNATIONAL RESPONSE TO TYPHOON HAIYAN

Introduction

On the 5th of November 2013 meteorologists determined that a tropical storm in the Northern Pacific Ocean was developing into a typhoon as it tracked towards the Federated States of Micronesia (FSM) and Palau. Designated Typhoon Haiyan, known locally in the Philippines as Typhoon Yolanda, it continued to grow in strength to a Category 5 typhoon and hit the southern archipelagic region of the Philippines during the night of 7th November 2013.¹³⁷ Over the next 24 hours the typhoon, judged by some to be the most powerful storm ever recorded, devastated areas around Calabrazon, Mimaropa and Tacloban City (see Figure 1) and affecting an estimated 11.3 million people.¹³⁸ The international community rushed to provide humanitarian and disaster relief to one of the poorest and most undeveloped areas of the world. The disaster relief effort was concentrated in the first two weeks to relieve the immediate suffering of those displaced, without food or shelter and then moved to a phase of recovery, returning the damaged area to a pre-typhoon situation. Air power played a key role in these efforts.

This chapter will concentrate on analyzing the aerospace functions that contributed to the assistance efforts following the devastating effects of Typhoon Haiyan. Initially, it will detail the strategic coordination of aerospace assets from international sources to the host nation within the disaster zone. The level of information available to commanders and coordinating agencies was a main factor in making appropriate decisions about the apportionment of aid. A number of

¹³⁷ United Nations Office of the Coordination of Humanitarian Affairs, *Philippines: Typhoon Haiyan Action Plan*, Humanitarian Country Team, (November 2013), 1.

¹³⁸ *Ibid*, 1.

aerospace ISR techniques were used to provide damage assessment and information regarding affected populations to commanders and coordinating agencies.

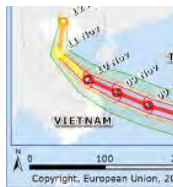


Figure 1 Path and Effect of Typhoon Haiyan

Source : European Commission Humanitarian Aid Department , *Philippines, Vietnam – Tropical Cyclone HAIYAN*, 8 November 2013

The effective communication within the region also proved to be a critical factor in getting the right resources to those people that needed it most. This chapter will further study the air mobility operations following Typhoon Haiyan and the lessons learned from the experiences of both air force and civilian air agencies. The efforts to protect the HADR operation will also be analyzed and the soft power effects resulting from the humanitarian response. This case study will use the experiences of the HADR efforts in response to Typhoon Haiyan to illustrate the important contribution made by aerospace power and identify factors that would benefit from an increased emphasis on HADR operation in aerospace power doctrine.

Initial Response and Coordinating Actions

The initial warning of the strengthening storm came from the Joint Typhoon Warning Centre (JTWC), a US Government service utilizing the meteorological services and aerospace ISR assets controlled by the USN and USAF. The information regarding the storm was passed to the Philippine Government National Risk Reduction and Management Council. The council used this information to evacuate “125,604 people to 109 evacuation centres in 22 provinces.”¹³⁹ Immediately following the passing of the typhoon, the Philippines Air Force airlifted essential drinking water and food supplies to the affected areas. The vast numbers of people injured, displaced and requiring aid coupled with the extent of their geographical disbursement overwhelmed the capabilities of the Host Nation (HN), requiring the Philippines Government to formally request international assistance.¹⁴⁰

A number of US forces based in the Philippines were readily available to render immediate assistance. Initially, UN Disaster Assessment and Coordination teams were flown in to the area to provide a more detailed assessment of humanitarian needs.¹⁴¹ As early as the 10th November 2013, Canada deployed an Interdepartmental Strategic Support Team (ISST) which arrived by CC-144 Challenger to determine the humanitarian needs of Internally Displaced Persons (IDP) and assess the possible support requirements under Operation *RENAISSANCE*.¹⁴² Australia established Operation *PHILIPPINES ASSIST* promptly deploying a C-130J aircraft

¹³⁹ United Nations Office of the Coordination of Humanitarian Affairs, *Philippines: Typhoon Haiyan Action Plan*, Humanitarian Country Team, (November 2013), 2.

¹⁴⁰ *Ibid*, 4

¹⁴¹ United States, “Navy P-3C Aircrews Assist Relief Efforts in the Philippines” *American Forces Press Service*, (17 November 2013), accessed 19 Jun 14, <http://www.defense.gov/news/newsarticle.aspx?id=121157>.

¹⁴² Canada, Department of National Defence, *Operation RENAISSANCE 13-1*, accessed 19 Jun 14, <http://www.forces.gc.ca/en/operations-abroad/op-renaissance.page>

with an Air Component Coordination Element and a Primary Health Care Team (PHCT).¹⁴³ Aircraft carrying similar teams were flown in from countries all around the world, including offers from a range of NGOs. To produce the required HADR effects, these agencies had to be coordinated and controlled responsibly with decisions based on critical information about the humanitarian situation.

Sensing the HADR Environment

The aerospace function of Sense provided forewarning of the impending disaster and enabled the Philippine authorities to take measures to reduce the impact on the area. Following the event an aerial survey of the Leyte province determined the extent of the damage to the coastal areas.¹⁴⁴ The US Navy dispatched two squadrons of P-3C Orion maritime patrol aircraft based in Japan to conduct search and rescue missions in the affected area. The P-3Cs flew missions to assess the damage to the regions and to determine the location of people without food, water and shelter. This task was only able to be conducted by air due to the archipelagic nature of the area with population scattered over 7000 islands.¹⁴⁵ The aim of these missions was to provide the commanders of the US forces with information as swiftly as possible to assess the areas of highest need. Data from satellite imagery coupled with surveillance by US Navy VP-26 Tritons and VP-62 Broad Arrows aircraft were able to “provide the critical information about where to best focus relief efforts.”¹⁴⁶

¹⁴³ Australia, Department of Defence, *Australian Defence Force completes Philippines recovery operation*, accessed 19 June 2014, <http://news.defence.gov.au/2013/12/18/australian-defence-force-completes-philippines-recovery-operation/>

¹⁴⁴ United Nations Office of the Coordination of Humanitarian Affairs, *Philippines: Typhoon Haiyan Action Plan*, Humanitarian Country Team, (November 2013), 1.

¹⁴⁵ United States, “Navy P-3C Aircrews Assist Relief Efforts in the Philippines” *American Forces Press Service*, 17 (November 2013), accessed 19 Jun 14, <http://www.defense.gov/news/newsarticle.aspx?id=121157>

¹⁴⁶ Ibid.

Once the areas of critical damage were determined the sense effort focussed on determining what had to be done to deliver the aid to those areas. The locally based USAF 353rd Special Operations Group as part of Operation *Damaycan* conducted sorties to airports in the region to assess the damage and determine the suitability of airfields for use.¹⁴⁷ Unmanned Aerial Vehicles (UAV) were also found to be effective in capturing imagery of affected areas that were not able to be accessed by road. The Ateneo de Manila University used expendable, low cost drones to provide information directly to the Red Cross.¹⁴⁸ The use of UAVs in this localized environment provided a quick assessment of the situation directly to NGOs in areas where a comprehensive assessment had not been conducted.

In addition to passive data collection, another problem facing the HADR situation was the lack of communications within the area. It was determined that 70% of the affected area was without telecommunications and 90% of the area was without electrical power.¹⁴⁹ This made the provision of emergency communication with the local population a priority. Air Force air transportable communications units are trained and equipped to be self-supporting and deploy to austere locations to set up communications centres. OCHA requested emergency telecommunications equipment and trained radio personnel, during the first weeks no NGOs were able to accommodate these requests, requiring them to be filled by international forces.¹⁵⁰ This lack of communication coupled with the absence of liaison personnel in the remote communities, limited the two way flow of information between those affected and the relief

¹⁴⁷ United States Air Force, “AF special operations group key to aid effort after Typhoon Haiyan”, *USAF News*, (21 November 2013), accessed 19 June 14, <http://www.af.mil/News/ArticleDisplay/tabid/223/Article/467571/af-special-operations-group-key-to-aid-effort-after-typhoon-haiyan.aspx>

¹⁴⁸ Centre for Excellence in Disaster Management & Humanitarian Assistance, *Lessons from Civil-Military Disaster Management and Humanitarian Response to Typhoon Haiyan (Yolanda)*, Centre for Excellence in Disaster Management & Humanitarian Assistance, (January 2014), 23.

¹⁴⁹ *Ibid*, 11.

¹⁵⁰ *Ibid*, 11.

agencies. The inability of commanders to communicate with the local population centres and receive reports on their wellbeing is a significant obstacle to the efficient provision of HADR.

Further to the need for two-way communications is the necessity of open communication between agencies. There was not a commonality of information that was shared between ISR assets to create one common picture available to commanders which “hampered the unity of efforts.”¹⁵¹ To ensure the greatest level of situational awareness it is imperative that the widest range of information is disseminated and shared among HADR coordinating agencies.

Command, Control and Coordination

In determining the contribution a nation can make to HADR, it is important to respect the sovereign rights of the nation affected. Military forces or NGOs do not have the right to launch into a foreign country without a formal request from that HN. The US forces, operating under an existing Status Of Forces Agreement (SOFA) began immediate operations out of its bases within the Philippines, and Australia had begun relief flights to the southern islands on 13 November 2013 after the HN government made a formal request for international assistance.¹⁵² In response to this request, the UN OCHA determined an action plan that required the international community, working in collaboration with the HN Government, to meet approximately one third of the total relief efforts. This action plan detailed the initial priorities and actions required over a six month period to return the area to pre-typhoon levels of health, shelter and self-reliance. With the HN Government as the overarching authority and the UN OCHA as the international coordinating agency, International Government Organizations and NGOs were required to work

¹⁵¹ Centre for Excellence in Disaster Management & Humanitarian Assistance, *Lessons from Civil-Military Disaster Management and Humanitarian Response to Typhoon Haiyan (Yolanda)*, Centre for Excellence in Disaster Management & Humanitarian Assistance, (January 2014), 24.

¹⁵² Ibid, 11.

in collaboration to meet the HADR objectives. To coordinate relief efforts, the UN organizes functional clusters of agencies, providing a point of concentration for all those providing specific contributions such as shelter, logistics, telecommunications etc.¹⁵³

As the international aid started flowing in, the need for the aerospace function of command became readily apparent. In particular there was a requirement for Air Campaigning and Battlespace management. In the first week, US and Australian Air Forces, coupled with the HN air force started flying supplies and personnel to the damaged areas. Heavy lift aircraft began arriving in the major Philippine airport of Manila. There was a great deal of segmentation with many NGOs and foreign air forces being commanded and reporting to their own embassies instead of through a central agency.¹⁵⁴ There needed to be a comprehensive plan to coordinate and control this traffic so that all air agencies were working together to avoid uncontrolled, random and inefficient sorties. This is crucial in the early stages of HADR when the affected populations are lacking the most important basic necessities of water, food and shelter.

Despite overarching command, control and coordination at an operational level, the response to Typhoon Haiyan was criticized for its lack of coordination at a tactical level.¹⁵⁵ In the outlying distribution centres and logistics hubs, there were slow and limited mechanisms for command, control and coordination where the requirements were met through ad hoc arrangements.¹⁵⁶ The exception to this was in the Roxas area where the Canadian Disaster Assistance Response Team (DART) had set up multilingual liaison officers, including a Royal Canadian Air Force officer who joined local police to provide a translation service. The “Capiz

¹⁵³ United Nations Office of the Coordination of Humanitarian Affairs, *Philippines: Typhoon Haiyan Action Plan*, Humanitarian Country Team, (November 2013), 3.

¹⁵⁴ Centre for Excellence in Disaster Management & Humanitarian Assistance, *Lessons from Civil-Military Disaster Management and Humanitarian Response to Typhoon Haiyan (Yolanda)*, Centre for Excellence in Disaster Management & Humanitarian Assistance, January 2014, 24.

¹⁵⁵ *Ibid*, 40.

¹⁵⁶ *Ibid*, 35.

Model,” named after the capital of Roxas served as an example of how successful civil-military coordination can be when the agencies are collocated and have broad information sharing.¹⁵⁷ Moreover, the experience from Typhoon Haiyan showed that those air force planners and commanders who had previous training or experience in HADR operations were more open to civil-military cooperation and better equipped for the HADR situation.¹⁵⁸

Having numerous aircraft from a number of international militaries and civilian organizations flying in the same environment increased the risk of an accident and further compounded tragedy. Airspace management became a critical factor in ensuring the safe conduct of relief operations. Not only was there a significant increase in the number of aircraft movements but also limitations caused by damage to infrastructure. This resulted in significant air traffic congestion in Manila and Tacloban airports causing costly delays.¹⁵⁹ Military air traffic controllers supplemented the local airport staff and utilized deployable air traffic control facilities at damaged airfields. To facilitate the management of the rapidly crowding airspace, the USN launched E-2C Hawkeye aircraft to “direct and de-conflict traffic.” The P-3C Orion and E-2C Hawkeyes also worked to relay vital information such as suitability of landing zones and disaster areas needing assistance.¹⁶⁰

Air Mobility Effects

The Air Mobility effects in providing HADR following Typhoon Haiyan were noticeable on two distinct levels. These were the strategic air lift of cargo, supplies and personnel into the

¹⁵⁷ Centre for Excellence in Disaster Management & Humanitarian Assistance, *Lessons from Civil-Military Disaster Management and Humanitarian Response to Typhoon Haiyan (Yolanda)*, Centre for Excellence in Disaster Management & Humanitarian Assistance, (January 2014), 28.

¹⁵⁸ *Ibid*, 12.

¹⁵⁹ United Nations Office of the Coordination of Humanitarian Affairs, *Philippines: Typhoon Haiyan Situation Report 8*, Humanitarian Country Team, (14 November 2014), 5.

¹⁶⁰ United States, “Navy P-3C Aircrews Assist Relief Efforts in the Philippines” *American Forces Press Service*, (17 November 2013), accessed 19 June 2014, <http://www.defense.gov/news/newsarticle.aspx?id=121157>

region through major airports such as Manila and the more localized effects of tactical airlift into the affected regions. Both levels of air mobility were critical to the success of the HADR operation particularly in the initial two weeks of the relief operation. The early involvement of military airlift capability was the essential key to ensure the immediate basic humanitarian needs of the affected population were met and “pivotal in the success of the subsequent relief operation.”¹⁶¹ In particular, the military airlift capability to move large quantities of aid quickly and the appropriate distribution of those supplies was praised as being the reason the “morbidity and mortality” figures were kept relatively low.¹⁶²

The air mobility operation following Typhoon Haiyan followed a hub and spoke model, where large aircraft were flown into Manila and then out to the main logistics hubs at Tacloban, Mactan Air Base near Cebu, Ormoc and Roxas. These hubs were then used by lighter aircraft and helicopters to transfer supplies to local distribution points. A total of 12 foreign militaries provided support with aircraft such as C-5s, C-17s and C-130s flying strategic airlift flights into Manila and Tacloban Airports. In addition to moving supplies and people into the area, Australian and US air force flights carried over 8,000 displaced persons out of the affected area to safety. Besides the military flights, a number of civilian cargo operators such as Lufthansa, Chapman Freeborn, and Japan Air Lines used Antonov An-12, Airbus A340, Boeing 777 and Boeing 747 freighters to fly cargo to the Philippines. Lufthansa, for example, used an Airbus A340 which moved 25 tonnes of cargo including medical supplies 5,400 fleece blankets, 3,000 plastic tarpaulins and tents.¹⁶³ These civilian air cargo companies received donated supplies from

¹⁶¹ Centre for Excellence in Disaster Management & Humanitarian Assistance, *Lessons from Civil-Military Disaster Management and Humanitarian Response to Typhoon Haiyan (Yolanda)*, Centre for Excellence in Disaster Management & Humanitarian Assistance, (January 2014), 12.

¹⁶² Ibid, 13.

¹⁶³ “Airfreight responds to typhoon Haiyan”, *Air Cargo Week*, (15 November 2013), accessed 28 June 14, http://www.aircargoweek.com/news/Airfreight-responds-to-typhoon-Haiyan_5044.html

government and non-government agencies. United Airlines established a partnership with Americares, the American Red Cross, and Operation USA to operate charter flights into Manila airport carrying the supplies from these organizations.¹⁶⁴

With cargo starting to pile up in Manila and Tacloban, the job of the airlifters was to distribute the right supplies to those who needed them. This distribution was a collaborative process between NGOs, the UN and foreign air forces. In the first few days of the operation at Mactan Air Base the facilitation of the distribution was conducted by one man acting alone as a logistics cluster without standard operating procedures.¹⁶⁵ This led to delays and inefficient loading of flights and numerous aircraft parked on the airfield awaiting loading. This prompted the recommendation that standard procedures be implemented for aid distribution from the very outset of the operation.¹⁶⁶

Another challenge that faced the air mobility operation was the lack of facilities and equipment at forward airfields to load and unload supplies. Guiuan airport for example was deficient in basic facilities such as forklifts, requiring pallets of cargo to be manually offloaded through human chains.¹⁶⁷ This slowed down the process considerably and led to a number of minor injuries to aid workers. The availability of Material Handling Equipment at aerial ports of disembarkation needs to be considered early in the HADR operation to ensure the most efficient distribution of supplies.

¹⁶⁴ Airfreight responds to typhoon Haiyan”, *Air Cargo Week*, (15 November 2013), accessed 28 June 14, http://www.aircargoweek.com/news/Airfreight-responds-to-typhoon-Haiyan_5044.html.

¹⁶⁵ Centre for Excellence in Disaster Management & Humanitarian Assistance, *Lessons from Civil-Military Disaster Management and Humanitarian Response to Typhoon Haiyan (Yolanda)*, Centre for Excellence in Disaster Management & Humanitarian Assistance, (January 2014), 31.

¹⁶⁶ *Ibid*, 32.

¹⁶⁷ *Ibid*, 43.

Protecting the Relief Operation

A number of shield functions were conducted in the response to Typhoon Haiyan to protect the personnel and equipment that were being utilized in the relief operation. In desperate need of basic necessities such as food, the local population swamped a rice storage facility in Alangalang, Leyte province taking away over 100,000 sacks of rice. The security was inadequate to cope with such a huge crowd bent on securing food stuff.¹⁶⁸ This demonstrated the need for protection of not only the aid workers but the actual supplies themselves, to ensure they were distributed proportionately. Similar scenes were evident at Tacloban airport when over 3000 IDPs swarmed onto the taxiways at Tacloban Airport in an attempt to get onto one of the two Philippines Air Force C-130s.¹⁶⁹ These types of incidences highlighted the need to not only ensure adequate levels of protection for the HADR operation but also to get the aid out to the people as quickly and as fairly as possible.

Being over protective of information in HADR operations can lead to negative effects. Military imagery can inherently be burdened with classification limitations making it difficult to disseminate to non-military agencies. OCHA officials “gave up on trying to coordinate” with the USAF at Villamour Air Base near Manila because data was deemed as classified and not suitable for distribution, whenever a UN official entered a room it had to be cleared of sensitive information.¹⁷⁰ In addition to a reduction of the level of shared information, this also creates an atmosphere of mistrust between civil and military agencies.

¹⁶⁸ Kate Hodal and Tania Branigan , “Typhoon Haiyan: eight die in food stampede amid desperate wait for aid”, *The Guardian*, (13 November 2013).

¹⁶⁹ Ibid.

¹⁷⁰ Centre for Excellence in Disaster Management & Humanitarian Assistance, *Lessons from Civil-Military Disaster Management and Humanitarian Response to Typhoon Haiyan (Yolanda)*, Centre for Excellence in Disaster Management & Humanitarian Assistance, (January 2014), 32.

Soft Power Effects

The international response to the devastation of Typhoon Haiyan was generous and displayed the caring nature of many nations. In addition to the selfless tangible relief provided to the Philippines population there were a number of soft power effects. Vice Admiral Ray Griggs, Chief of the Royal Australian Navy stated “Contributing to the clean-up of the typhoon in the Philippines last year, in my mind that was a power projection activity. [It was] projecting soft power, but it was power projection.”¹⁷¹ The US found the soft power effects of the HADR operation particularly beneficial. The US military relationship with the Philippines was gaining a level of prominence due to the foreign policy pivot towards Asia. There had been a number of negative incidents with Philippines based US troop and discussions regarding the future of US bases had been underway for some time. American HADR operations in response to the typhoon thus had a significant effect; a US congressional report stated that the “involvement of U.S. military forces in Haiyan relief efforts bolstered support for enhanced U.S.-Philippine military cooperation.”¹⁷²

Despite having a strategic and territorial interest in the region, China provided minimal assistance or aid following the typhoon. China provided as little as US\$100,000 in aid and practically no physical response. James Holmes of the *Diplomat* criticized this as “not the behaviour of an aspirant of regional leadership” and that it “razed its own soft-power edifice to the ground.”¹⁷³ China later increased its financial aid to a mere \$1.6 Million, less than the much

¹⁷¹ Claire Corbett, “Our Navy Blues”, *The Monthly*, (April 2014), 23.

¹⁷² Thomas Lum and Rhoda Margesson, “Typhoon Haiyan (Yolanda): U.S. and International Response to Philippines Disaster”, Congressional Research Service, (February 2014).

¹⁷³ Claire Corbett, “Our Navy Blues”, *The Monthly*, (April 2014), 18.

smaller New Zealand and sent a hospital ship, the *Peace Ark* which arrived weeks after the cyclone hit, treated relatively few patients and departed after only 25 days.¹⁷⁴

Typhoon Haiyan and Aerospace Power

The international response to Typhoon Haiyan demonstrated the soft power effects of HADR and the importance of air forces role as first responders in minimizing casualties and paving the way for further recovery assistance. There were also a number of lessons learned from this experience, such as the importance of open communication, appropriate sustainment and the benefits of realistic training. The next chapter will further investigate alternatives to air forces in these operations and determine how these lessons learned can be realized through changing doctrine.

¹⁷⁴ Anthony Bergin, "China's medical diplomacy and the Philippines", *The Strategist*, (29 November 2013), accessed 30 June 2014, <http://www.aspistrategist.org.au/chinas-medical-diplomacy-and-the-philippines/>

CHAPTER 6 - ADVANTAGES AND CHANGING EMPHASIS

The previous chapter demonstrated the valuable contribution made by aerospace power in HADR operations. Indeed there are a number of HADR roles that are best performed by aerospace functions. The aerospace characteristics of speed and reach provide an important role for air forces as first responders in disaster relief operations. This chapter will discuss the immediacy of effect provided by air and space assets and analyze whether air forces are best suited to conduct this role. Military doctrine provides the very framework for thinking, planning and the culture of armed forces. The benefits spawned by a changing the emphasis of aerospace doctrine toward HADR operations will therefore also be addressed in this chapter. Lastly, the potential outcomes of shifting the doctrinal emphasis will be discussed in terms of the enabling functions of Generate and Sustain.

Immediacy of Effect

It is acknowledged that a few of the functions that aerospace power contributes to HADR operations can be provided to some extent by land and sea forces. Certainly, sealift offers the ability to carry far greater loads and deliver larger, heavier equipment than those that are capable of being transported by air. Land forces offer a higher level of local engagement and an ability to provide longer term recovery and development. The characteristics of aerospace power however, offer a number of significant advantages over other environmental forces in HADR. One of the most important contributions, indeed the one that only can be provided by aerospace power is

immediacy of effect. Immediacy of effect is the combination of aerospace characteristics, implemented through the Act function, to rapidly accomplish desired outcomes.¹⁷⁵

The speed, reach and penetration of aircraft allows for aerospace power to act as the first response to humanitarian crises, even from the furthest reaches of the globe. Aircraft provide an agile platform that can be on short notice standby to deploy on tasks covering a range of aerospace functions. The flexibility of aerospace power also allows for aircraft to be redeployed from other tasks or sent to multiple areas. This immediacy of effect is an important critical factor to ensure the utmost survivability of the affected population. The distance between point of embarkation and disembarkation determines the time it will take for assistance to arrive in the affected area. No matter what this distance, modern aircraft have the capability to cover these distances within a matter of hours. The initial Canadian Disaster Assistance Response Team flew from Trenton to Manila by CC-150 Polaris taking less than 15 hours to arrive.¹⁷⁶ This immediacy of effect is most vital in the first two stages of disaster response, the immediate lifesaving phase and the stabilization phase.

Comparisons to other Military Mobility

US joint doctrine acknowledges the strengths and weaknesses of air, land and sea mobility and utilizes the synergy of the combination of the three to ensure the most successful outcome. The strategic mobility triad, as indicated in Figure 3, ensures that with appropriate prepositioning and preparation, “air mobility transports the light high priority forces and

¹⁷⁵ ‘Immediacy of Effect’ is an original term devised during the course of this thesis.

¹⁷⁶ Canada, Department of National Defence, *Operation RENAISSANCE 13-1*, accessed 19 June 2014, <http://www.forces.gc.ca/en/operations-abroad/op-renaissance.page>

supplies.”¹⁷⁷ This includes units and equipment that can integrate with the prepositioning forces to prepare for the follow on heavy sealift and sustainment for the already deployed forces.



Figure 3 – Strategic Mobility Triad

Source - United States, Joint Publication JP4-01.2, Sealift Support to Joint Operations, 31 August 2005, I-1.

The US Navy plans for a time period of between 4 – 20 days for ready reserve ships to be ready to depart port.¹⁷⁸ Many specialized air transportable teams such as the Canadian DART are established to deploy at a short notice of between 3 to 12 hours on HADR operations. These teams are typically equipped to conduct operations for 10-12 days but not usually more than 40 days; time enough to conduct the initial first response activities before being resupplied, reinforced or replaced by ground or seaborne operators.¹⁷⁹

The use of aerospace power as first responders allows for not only the immediate aid of the afflicted but for the preparation of the HADR theatre for follow on forces. Disaster affected areas require the repair of land and sea transport infrastructure before these heavier methods can be used. Advance parties can be inserted by air to repair and prepare port facilities for the arrival

¹⁷⁷ United States, Joint Publication JP4-01.2, Sealift Support to Joint Operations, (31 August 2005), I-1.

¹⁷⁸ Ibid, I-1, III-11.

¹⁷⁹ Canada, Department of National Defence, B-GJ-005-307/FP-040, *Humanitarian Operations and Disaster Relief Operations*, (31 May 2005), 4-3.

of heavier sea lift capability. Instead of inter-service rivalry, the best results are achieved by a complimentary effort that acknowledges the advantages and disadvantages of all three forces.

In HADR operations the immediacy of the initial response can be crucial to those in need. Not only does aerospace power have the ability to provide the tangible relief of physical presence, but also the psychological reassurance that help is indeed on the way, alleviating the fear of helplessness and abandonment. For instance, in June 2013, a C-130 Hercules from the Royal Canadian Air Force air dropped food and essential supplies to a group of tourists that were stuck in the ice floes near Baffin Island.¹⁸⁰ This immediate response provided both the sustenance and a level of hope that allowed the tourists to survive long enough to await rescue by sea.

Alternatives to Air Force

In an ideal world there would be a billionaire philanthropist who sponsors the formation of an international rescue service that provides aerospace power to assist in global humanitarian and disaster crises. Unfortunately however, *Thunderbirds* remains a 1960s puppetry based television show. Air forces have the capability to provide an important contribution to HADR but there are a number of civilian alternatives that can also provide useful contributions to HADR operations.

The experiences following Typhoon Haiyan demonstrate the benefits of assistance from civilian air cargo freighters. Civilian companies can be chartered to fly bulk goods and personnel into main airports for further distribution. The use of these freighters is subject to their

¹⁸⁰ Shiv Malik, "Canadian military airdrops supplies to tourists stranded on Arctic ice floe", *The Guardian*, (26 June 2013), accessed 06 June 2014
<http://www.theguardian.com/world/2013/jun/26/canadian-airdrops-tourists-arctic-ice-floe>

availability and is of course encumbered by charter costs. There is also a factor of the time needed to organize the cargo freight operation and getting the materiel to the agreed air point of embarkation. The US Air Mobility Command, for example, has a number of standing contracts with civil air transport companies.¹⁸¹ Intra theatre air lift is also able to be performed by civilian air transport operators. The UN often uses chartered aircraft for its services within an area of operation and has established procedures for the establishment and conduct of such charters.¹⁸² These contracts do however require a period of time for processing and are often used in the recovery stage not the immediate life-saving stage. As many of these aircraft are supplied by eastern European companies, there have been concerns about the safety and standards of these charter companies.¹⁸³

Likewise, civilian companies can be chartered to provide the sense function through search and rescue. Once exclusively used by the military, Unmanned Aerial Vehicles (UAVs) are now more accessible to the civilian community. In addition to the Red Cross's utilization of UAVs in the Philippines, they have been used extensively within the US in disasters such as wildfires.¹⁸⁴ These UAVs are however on a smaller scale and have a shorter range than the military drones and are yet to gain the same level of expertise in data analysis.

Air forces have the advantage of being on standby to deploy at very short notice. Air forces are also equipped and trained to operate in austere environments and are largely self-sufficient with deployable maintenance facilities and personnel. The UN often uses foreign

¹⁸¹ Defense Industry Daily staff, "The US Military's International Airlift Contracts", *Defense Industry Daily*, (12 February 2012), accessed 09 July 2014, <http://www.defenseindustrydaily.com/the-us-militarys-international-airlift-contracts-05066/>

¹⁸² United Nations, "United Nations General Conditions for the Charter of Aircraft Agreements", United Nations Procurement Division, accessed 09 July 2014, http://www.un.org/Depts/ptd/sites/dr7.un.org_Depts.ptd/files/files/attachment/page/pdf/general_conditions_air.pdf

¹⁸³ Colum Lynch, "Is it still safe to fly on a U.N. helicopter?", *Foreign Policy*, (20 May 2013)

Accessed 09 July 13, http://blog.foreignpolicy.com/posts/2013/05/20/is_it_still_safe_to_fly_on_a_un_helicopter

¹⁸⁴ Heather Kelly, "Drones: The future of disaster response", CNN Cable News Network, (23 May 2013), accessed 09 July 2014, <http://whatsnext.blogs.cnn.com/2013/05/23/drones-the-future-of-disaster-response/>

military in HADR operations for their unique ability and effectiveness in six key areas: timeliness, appropriateness and competence, efficiency, absorptive capacity, coordination and costs.¹⁸⁵ The timeliness factor acknowledges the urgency of response in disaster relief and the importance of the immediacy of effect. Appropriateness and competence refers to unique capabilities of military air forces that are not obtainable in civilian fields. The aspect of efficiency is largely related to the techniques used in HADR operations and whether the military, normally trained in war fighting, can adapt to humanitarian tasks. Absorptive capacity is the ability of the HN to effectively integrate foreign military into the HADR operation. Due to the established command and control structures of air forces, this is often more readily absorbed than civilian assets and can be more readily coordinated at a tactical and operational level. Finally, the UN acknowledges that military forces can be expensive but that the nature of the funding is an issue for contributing nations to determine.¹⁸⁶ The costs of an air force commitment to HADR are an important planning consideration. Whilst there are certain alternatives, air forces offer several unique advantages for the employment of aerospace power in HADR operations.

Benefits of a Change in Doctrine

Aerospace doctrine provides the highest level of guidance and vision for the employment of an air force. Doctrine encapsulates the fundamental tenets and beliefs of an organization and establishes a conceptual basis for air forces. Aerospace doctrine determines how to “structure, train and develop our force.”¹⁸⁷ Importantly, aerospace doctrine should evolve and change as the nature of operations and the employment of air forces change. Doctrine should be “continuously

¹⁸⁵ United Nations, “The Effectiveness of Foreign Military in Natural Disaster Response”, (Stockholm International Peace Research Institute, 2008), 32.

¹⁸⁶ Ibid, 35, 40, 43.

¹⁸⁷ Air Marshal Geoff Brown quoted in Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2013), iv.

revalidated and never be considered as dogma.”¹⁸⁸ Aerospace doctrine should therefore be continually assessed for its relevance to the current and future employment of aerospace power. In addition to defining their employment on operations, doctrine is used as the advocate for the future direction of how an air force is structured, funded, the types of aircraft to be purchased and the training that is conducted. It has been established that HADR operations are becoming more prevalent and that air forces make an important contribution in these operations. There are, however, improvements and efficiencies that need to be made, and these must evolve with relevant doctrinal authority.

Following experiences in HADR and counter-insurgency, the US Army recently changed its doctrine to include an additional warfighting function of “engagement.”¹⁸⁹ This change acknowledges that there had been a lack of understanding of the concepts of the human domain in warfare. Similarly the USAF changed its doctrine in the last year to include an emphasis on the importance of culture when developing strategies for the employment of air power.¹⁹⁰ To ensure that air forces are evolving and adapting to the current and future requirements, a change of emphasis on HADR in aerospace doctrine will ensure that there is a change in the manner in which air forces are generated, sustained and structured. Changing doctrine leads to changes in not only the operational functions of how air forces conduct HADR operations, but importantly, also changes to the enabling functions of Generate and Sustain that determine planning for the future.

¹⁸⁸ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 1.

¹⁸⁹ Gary Sheftick, “TRADOC: Strategic Landpower concept to change doctrine”, *US Army News*, (16 January 2014), accessed 09 July 2014

http://www.army.mil/article/118432/TRADOC_Strategic_Landpower_concept_to_change_doctrine/

¹⁹⁰ United States, Air Force Doctrine Document, AFDD 1, (05 June 2013), 41.

Changes to the Generate Function

The Generate function prepares and develops an air force's capabilities "to meet force employment requirements."¹⁹¹ This function includes training, materiel and infrastructure acquisition to ensure future needs are met. The increasing prevalence of HADR operations and the important role played by air forces in these operations requires the right fit of equipment and aircraft to meet future challenges. Importantly, the training in the use of these tools must meet these changing requirements.

To remain relevant and to keep abreast of new technologies, air forces undergo continuous update and capability development programs. Projects for the acquisition of new aircraft must be determined within defence budgeting constraints.¹⁹² Determination of the allocation of these tight resources depends on the priorities determined by air force planners and the subsequent arguments presented to government detailing the need and future employment of aircraft. The Alenia C-27J replacement for the aging Caribou aircraft in Australia was argued primarily as a Battlefield Airlifter to move the army around the tactical battlespace. Despite this, the Australian Minister for Defence, the Honourable Stephen Smith highlighted the importance of generating air mobility requirements for HADR and indicated that the acquisition of the C27J for the RAAF was to be "able to operate from rudimentary airstrips in Australia and overseas and will be able to support humanitarian missions in remote locations."¹⁹³

The ability of aircraft to perform multirole functions should also be taken into consideration when determining acquisition priorities. Although Canada had purposely avoided the expense of a strategic airlift capability, the reliance on NATO and contractors was not

¹⁹¹ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 49.

¹⁹² Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2013), 208.

¹⁹³ Stephen Smith, Speech, Air Power Conference, National Convention Centre, Canberra, (10 May 2012).

meeting operational requirements. The Canadian CC-177 was purchased to address the lack of strategic airlift in the RCAF and in particular with the capacity to carry the Light Armoured Vehicle (LAV) III to operational areas such as Afghanistan.¹⁹⁴ In addition to this warfighting role, the CC-177 was identified as being needed to deploy Disaster Assistance Response Team on HADR operations; indeed within two weeks of delivery the aircraft deployed to Jamaica in the wake of Hurricane Dean.¹⁹⁵ Changing the emphasis on aerospace doctrine toward HADR operations alters the balance of priorities for the allocation of resources and funding for future acquisition programmes.

Another aspect of the generate function is training and developing the skills of personnel within the air force to “undertake all air power roles and missions with technical and professional mastery.”¹⁹⁶ Air forces regularly conduct training and exercises to further develop their war fighting skills in purely air environments such as Exercise Red Flag and also in combined exercises with other arms. The Centre for Excellence in Disaster Management and Humanitarian Assistance determined in a study of the response to Typhoon Haiyan that there was a need for “more varied approach to future DoD [US Department of Defense] training and joint exercise scenarios.”¹⁹⁷ This should include a comprehensive and realistic package that comprises participation by not only military forces but also interaction with civilian relief organizations. Such realistic exercises can have an additional soft power benefit by both demonstrating goodwill and establishing a level of trust in the nation’s air force. This was demonstrated in the

¹⁹⁴ Defense Industry Daily staff, “Canada Joining the Anglosphere C-17 Club with CC-177”, *Defense Industry Daily*, (17 November 2008), accessed 18 July 2014,

<http://www.defenseindustrydaily.com/canada-joining-the-anglosphere-c17-club-02388/#AdditionalReadings>

¹⁹⁵ Ibid.

¹⁹⁶ Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2013), 93.

¹⁹⁷ Centre for Excellence in Disaster Management & Humanitarian Assistance, *Lessons from Civil-Military Disaster Management and Humanitarian Response to Typhoon Haiyan (Yolanda)*, Centre for Excellence in Disaster Management & Humanitarian Assistance, (January 2014), 46.

recent Exercise Pacific Partnership, a United States (US) Pacific Command (PACOM) sponsored exercise involving the US, Australia, New Zealand, Japan and France. The stated aims of the exercise are to “strengthen international relationships, improve Host Nation resilience to Natural Disasters and improve the interoperability of regional forces in response to natural disaster and humanitarian emergencies.”¹⁹⁸ Air force medics and dentists performed tasks such as fixing the teeth of 3000 schoolchildren in East Timor.¹⁹⁹ Whilst these exercises provide valuable assistance and are a step in the right direction, further exercises involving realistic interaction between military, HN and NGOs is warranted. Changing emphasis on HADR in aerospace doctrine will foster a change in the balance of training and exercise scenarios.

Change to Sustain Function

The Sustain function of aerospace power ensures that the ability to maintain and regenerate the air force “during and after operations.”²⁰⁰ An inappropriate or insufficient sustainment process can have a detrimental effect on the outcome of an HADR operation.²⁰¹ HADR operations require equipment more suited to the task and different levels of sustainment to other war fighting aerospace roles. In disaster affected areas, aircraft operate into austere environments and need to begin a process to return the area to pre-disaster levels. This will necessitate self-sustaining logistics of the most basic necessities in addition to those required by the host nation. USMC Colonel Mayer noted that his marines, who were equipped to fight the war in Iraq but redeployed to Bangladesh to assist with flood relief operations, were “sinking in

¹⁹⁸ Australia, Department of Defence website, “Exercise Pacific Partnership”, accessed 18 July 2014, <http://www.defence.gov.au/exercises/pacificpartnership14/>

¹⁹⁹ Ibid.

²⁰⁰ Australia. Australian Air Publication, AAP 1000-D, *The Air Power Manual*, (Canberra, ACT: Air Power Development Centre, 2013), 93.

²⁰¹ Canada, Department of National Defence, B-GA-401-000 *Canadian Forces Aerospace Doctrine*, (Edition 2, December 2010), 46.

the mud” under the weight of their armour and equipment.²⁰² Whilst military forces often “make do” with what they have, this experience highlights the requirement to equip those conducting HADR operations with the right tools needed to do the job.

Advantages and Change

Aerospace power conducted by air forces offer a number of advantages in HADR operations. Air forces are equipped and ready to conduct operations at very short notice, providing the important and unique immediacy of effect which is vital in disaster relief operations. Air mobility has different strengths and limitations to sea lift which should be acknowledged and used to deliver the best combination of forces.

A change in the emphasis of aerospace doctrine towards HADR will have the flow on effect of ensuring the generation and sustainment of air forces is relevant to the prevalence of these operations in now and in the future. The right doctrinal emphasis provides a sound basis for determining aircraft acquisition projects and the suitable arguments for funding appropriations. Changing doctrine towards HADR operations also provides the vision of how these operations should be conducted.

²⁰² Col John Mayer, “31st Marine Expeditionary Unit, USMC in the Pacific”, Amphibious Operations Seminar, Royal United Services Institute of New South Wales, (27 May 2014).

CONCLUSION

Introduction

The very nature of warfare and the employment of armed forces have changed significantly over the last century. To remain relevant, doctrine must continue to keep pace with these changes. In particular, air power doctrine must be reflective of the growing importance of Humanitarian and Disaster Relief (HADR) operations, which include a range of tasks aimed at alleviating human suffering. Military forces are regularly called upon to respond to earthquakes, tsunamis, famines and typhoons, and air forces are becoming increasingly engaged in responding to these disasters. These operations can be conducted at home or in a foreign country to assist a host nation, to relieve the suffering caused by natural disasters or as a result of human occurrence. By analyzing the aerospace doctrine of Canada, the United States, the United Kingdom and Australia, this study has shown that whereas conventional war fighting is the main focus of these countries' doctrine, HADR operations are given scant regard. As doctrine provides the foundation for the very existence of air forces by defining their character, tenets and concepts, aerospace doctrine needs to change to reflect the changing prevalence of HADR operations.

Summary

This paper has proved that more emphasis should be placed on HADR operations in aerospace doctrine to ensure air forces are better prepared for future operations. It began by describing the changing nature of international relations and warfare that has seen a shift towards soft power. The character of international relations has changed considerably over the last 100 years. In particular, the fall of the Soviet Union left the US as the sole superpower, creating a

unilateral environment. Despite this overwhelming power, Chapter 1 shows that nations still need to legitimize their actions on the world stage through recognized international institutions using both hard power and soft power. Whilst hard power describes punitive actions including the use of military force, soft power, in contrast, uses the attraction of a nation's culture, values and policies as incentive and attraction. The mix of hard and soft power to achieve a nation's goals has been termed smart power.

Chapter 2 demonstrated that, although traditionally associated with hard power, armed forces play a major role in the projection of a nation's soft power. It showed the way military forces project soft power by demonstrating a nation's power and goodwill. A nation's military force can assert influence and attraction by demonstrating the power of that nation. This can be effected through the display of a nation's wealth, technological advancement and ability to project force. Air forces often demonstrate power through air shows, fly pasts or just by making a show of flying a head of state to a foreign country. Military forces can also be used to demonstrate the goodwill of a nation and to underscore their foreign policy agenda. By acting as a responsible global citizen, a nation can exercise soft power when assisting another country in their time of need. In addition to altruistic motives, HADR operations are an important demonstration of a nation's goodwill and embodiment of their foreign policy. Smaller powers have the ability of gaining greater influence in world affairs by being relevant, contributing to humanitarian assistance and furthermore by demonstrating their capacity to assist when needed.

Air forces make an important and unique contribution to HADR operations, providing the immediacy of effect critical to saving lives in the initial phases. The characteristics of aerospace power provide a distinctive ability to contribute to these operations, as shown in Chapter 3. The four characteristics of Elevation, Speed, Reach and Agility combine to provide an immediate and

persistent response to global and regional HADR operations. Elevation provides the perspective to gain a greater assessment of the affected area through surveillance and the ability to communicate beyond line of sight. The speed and reach of aircraft allows a rapid response to crises, delivering aid and level of hope to where it is needed in the critical immediate life-saving phase of an HADR operation. The agility of aerospace power to adapt to different and changing situations is a vital force multiplier. Aircraft can perform multi-role or swing role missions, being readily available to change tasks or area of operation.

Chapter 3 also detailed that aerospace power does however have a number of limitations that need to be considered when planning and conducting HADR operations. Being fast and able to travel long distances limits the amount of payload that can be carried by aircraft. Rotary wing aircraft and those limited to shorter airfields are also limited by the payload they can carry. Aircraft are inherently dependent on support, requiring a support base of operations to refuel, replenish and repair. Modern aircraft are fragile and vulnerable to the elements, requiring operational planners to account for aircraft unserviceability and unavailability.

Chapter 4 described how the operational functions of aerospace power all provide important contributions to HADR operations. The function of Command can be complex within a HADR operation involving the Host Nation, international military forces, government and non-government organizations. Moreover, Command is paramount to guarantee the most efficient use of aircraft and distribution of life saving resources. The function of Sense provides commanders with the information required to make informed decisions. The aerospace characteristic of Perspective, coupled with advanced technology, is essential in determining the extent of damage, assessment of infrastructure and the whereabouts of survivors. The Act function of Shape can afford an important level of protection or deterrence from aggression to relief operations.

Information Operations are necessary to confirm the right message is getting out to the affected population and also to the outside world.

The Shape function of Move is arguably the most prominent form of aerospace power in HADR operations. Air Mobility missions utilizing fixed wing and rotary wing transport aircraft are able to distribute personnel, equipment, essential supplies, food stuffs and a range of other cargo. Air mobility delivers these items strategically into the theatre of operations and around the distribution network. Aeromedical evacuation and air transportable medical facilities ensure the swiftest treatment of casualties. The enabling function of Shield also minimizes the exposure of personnel and equipment to vulnerability and ensures their freedom to conduct HADR operations. Importantly, the local population must also be afforded a level of protection, not only for their own wellbeing, but as reassurance to avoid alienation from the relief personnel.

The case study on the aerospace contributions following the devastation of Typhoon Haiyan in Chapter 5 highlighted many lessons for future aerospace HADR assistance. The initial assessment, coordination and planning was vital in the immediate life-saving phase. Establishing communication networks and the sharing of information among military and civilian agencies helped achieve the greatest unity of effort. Whilst strategic and operational level command and coordination worked along established practices, there was a lack of tactical level coordination, causing congestion and inefficiencies which slowed down relief efforts. Experiences in the Philippines demonstrated the need to protect air assets and preposition the right handling equipment. One of the clearest lessons learned was the importance of appropriate and realistic training for future HADR operations. The international response to Typhoon Haiyan also proved the soft power gains of HADR operations and the negative impact on those countries offering little or no support.

An analysis of alternatives to aerospace power was made in Chapter 6. It was determined that whilst land and sea forces provide important contributions to HADR operations, only air forces are able to provide the important factor of immediacy of effect. The combination of aerospace characteristics, implemented through the Act function, rapidly accomplishes desired outcomes. This situates air forces as the first responders to HADR situations and is a critical factor to ensure the greatest chance of survivability of the affected population.

Air mobility is unable to match the sheer volume that sea lift can provide; nor can aerospace power provide the number of boots on the ground or heavy equipment that can be supplied by land forces. In addition to providing immediate HADR aid, air forces can prepare the way for larger follow on forces. Acknowledging the strengths and weaknesses of air, land and sea mobility and utilizing their synergy in combination delivers the most successful outcomes.

There are of course civilian alternatives to the use of military aircraft in HADR operations. Strategic airlift into the theatre of operations and intra theatre airlift can be utilized during the recovery and stabilization phases by chartered aircraft once appropriate provisions are made. There are however a number of advantages of using established military air forces, including their rapid response times, specialist capabilities and competence, efficiency, ability to work within established coordination structures and adherence to command and control concepts. Importantly also, the cost of contributing air force resources are borne by the contributor, often absorbed in defence budgets and not added to the burden of the host nation.

Changing Doctrine

Military doctrine provides the very framework for thinking, planning and the culture of armed forces. Whilst there have been air power theorists since the very dawn of aviation, formal

aerospace doctrine was developed to encapsulate this thinking and provide air forces with a *raison d'être*. In particular, aerospace doctrine is the foundation for the way in which operations are conducted and for planning for the future. As such, doctrine must adapt and change to remain relevant. The changing prevalence of HADR operations coupled with the unique and important contribution made by air forces requires that aerospace doctrine evolves accordingly.

Changing doctrine also leads to resulting modifications to the Generate and Sustain enabling functions. A change in emphasis on HADR operations in aerospace doctrine will ensure that air forces are generated appropriately through the suitable acquisition of aircraft and equipment. In times of constrained budgets, funding arguments must be based on sound doctrinal reasoning. Importantly, a change in emphasis will also focus training towards more realistic employment scenarios and develop the skills needed by air force personnel to complete HADR missions. Changing aerospace doctrine also provides the basis for the Sustain function, ensuring that deployed forces are adequately equipped and regenerated to meet the challenges of the task.

Hard but Smart Decisions for the Future

Whilst we continue to require the kinetic aspects of aerospace power, it is time to be realistic about the ways in which we are likely to employ our air forces in the future. Air forces should not be shackled to the dogma of previous conflicts. Governments need to be confident that they can use their air forces in a variety of ways to achieve their foreign policy goals.

Increasingly, this is realized in soft power roles, including providing real and immediate effects in humanitarian situations. Ensuring that the humanitarian roles of aerospace power are given their due will allow air forces to concentrate on improving the areas that need it most. We

need the right aircraft, tools and trained people to accomplish the actual job at hand. Surely, helping those in need should be the altruistic goal of all nations.

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