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The Aerospace Engineering Community – A Study in Culture and Leadership

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ABSTRACT

The majority of military leadership writings and research are concerned with those most closely involved with Huntington's conception of the direct management of violence. As such, the realm of those in support roles has largely gone unstudied. Due to its direct support role as part of the Air Ops branch, and its large population in the context of the Air Force, the AEM (Aircraft Engineering and Maintenance) culture, more specifically the AERE (Aerospace Engineer) community as AEM leaders, merits closer examination.

This paper examines the community's moral component, or human dimension, through the lens of culture and leadership to determine whether its origins, values, homogeneity, and nature of its business influence the culture's leadership. Further, it determines if its leadership is a distinct manifestation in comparison to rest of the Air Force. The paper concludes that the community has a unique history centred on the competency of engineering, and is comprised of two distinct sub-cultures: maintenance operations and engineering support. The culture exhibits unique leadership development, and its leadership is characterized as largely transformational, but with transactional tendencies, dependent on sub-culture. Despite its basis in engineering, a strong foundation in leadership enables both the engineering and operations competencies within the AERE culture.

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CHAPTER 1: INTRODUCTION

Leadership is a popular area of study in the military; however, the majority of the writings and empirical research is focused on the Army. Arguably, this focus on Army leadership is due to the profession of arms' preoccupation with the "combat-warrior" image.[1] As such, little anecdotal or empirical research is available regarding leadership in the Air Force. The majority of what does exist is United States Air Force centric; revealing a lack investment on the part of the Canadian Air Force in the examination of its own culture and leadership.[2] Additionally, the leadership research tends to focus on those employed in traditional operator roles of the services, including combat arms, aircrew, and maritime surface and sub-surface officers; with little attention paid to the leadership exhibited by the large military population that support operations.

Army doctrine refers to the concept of fighting power, the application of which achieves desired outcomes and end states. It is not limited to that which is destructive or physical, such as land or air combat forces, but to any military capability, including support. As such, fighting power's components: the physical, the moral, and the intellectual, provide a useful framework against which a military capability, or organization, can be examined.[3]

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[1]Gwyn Harries-Jenkins, *Professional Groups and Subgroups in the Contemporary Military: Challenges and Opportunities* (Kingston, ON: Canadian Forces Leadership Institute, 2003), 30.

[2]Allan English and Colonel John Westrop (retired), *Canadian Air Force: Leadership and Command: The Human Dimension of Expeditionary Air Force Operations* (Trenton, ON : Canadian Forces Aerospace Warfare Centre, 2007), 89.

[3]Department of National Defence, B-GL-300-001/FP-001

The physical component includes the tangible aspects of a military capability including its structure, equipment and training. The intellectual component "consists of the conceptual elements of education and doctrine, and the perceptions and understanding of the operating environment."[4] This component allows an organization to respond to changes in its environment in attempt to effectively apply its capability. The moral component "provides the ethical and cultural base from which...morale, cohesion, *esprit de corps*, and fighting spirit" are derived.[5] This component encompasses the intangible aspects of fighting power, and is its human dimension.

Given the tangibility of the physical and intellectual components, they are more readily studied and documented, but it is the moral component, specifically the concepts of culture and leadership, that is more elusive. This could explain the overwhelming lack of study in this area in the Air Force. The three components of fighting power are interdependent, and must be viewed as a whole; where changes to one component may impact the other components. These effects may be immediate or could take some time to manifest. Leaders of organizations must be conscious of this synergistic relationship, and be cautious of paying too much attention in one area to the detriment of another.

As the Air Force transforms it "…is becoming the expeditionary, network-enabled, capability-based and results focused aerospace force that will satisfy Canada's 21st century security needs."[6] This transformation is evidenced by recent and ongoing

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[4]Department of National Defence, B-GL-300-001/FP-001 *Land Operations DRAFT*, 4-2/36.

[5]*Ibid*., 4-2/36 (emphasis added in original).

[6]Department of National Defence, B-GA-400-000/FP-000 *Canadian Forces Aerospace Doctrine*, (Ottawa: Director General Air Force Development, 2007), ii.

capability acquisitions such as the C-17 Globemaster, CH-148 Cyclone, and CH-147 Chinook. These have obvious effects on the Air Force's physical and intellectual components of its fighting power, such as changes to its organizational structure, increases in equipment, and the development and generation of new training and education programs. Leaders of the Air Force need to be cognizant of the resultant effects on the moral component, particularly, culture and leadership, during these times of change. In order to fully appreciate these effects, a better understanding of the Air Force's constituent sub-cultures, including support, and their distinctive leadership, is required. It is commonly accepted amongst theorists that in order for an organization to respond effectively to the changing environment, that its leaders need to understand the culture. Edgar H. Schein, psychologist and expert in the field of organizational culture posits:

> [i]n an age in which leadership is touted over and over again as a critical variable in defining the success or failure of organizations, it becomes all the more important to look at the other side of the leadership coin - how leaders create culture and how culture defines and creates leaders.[7]

It is recognized in Canadian Forces (CF) leadership doctrine that the Army, the Navy, and the Air Force have distinct identities or cultures, which "manifest certain elements of the CF's ethos in different ways, for example, in leadership styles..."[8] [9] Within the Air Force it is commonly accepted that there are distinct communities, or sub-

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[7]Edgar H. Schein, *Organizational Culture and Leadership*. 3rd ed. (San Francisco: Jossey-Bass, 2004), xi.

[8]Department of National Defence, A-PA-005-000/AP-001 *Duty with Honour: The Profession of Arms in Canada* (Kingston: The Canadian Defence Academy, 2003), 53.

[9]English, and Westrop. *Canadian Air Force: Leadership and Command*…, vii.

cultures, with which members can identify. English and Westrop identify these as operational or occupational communities, or stovepipes.[10] The operational communities are differentiated by aircraft fleet, such as, Maritime, Fighter, Transport and Tactical Helicopter. The occupational communities are distinguished by occupation or trade; for the purposes of this paper, the operator and support cultures.

The Aircraft Engineering and Maintenance (AEM) community provides a direct support function to air operations through the provision of aircraft maintenance.[11] The AEM community is comprised of the Aerospace Engineering (AERE) officer occupation, and Air Technician occupations (Air Tech). The community comprises 36% of the Air Force, arguably its largest sub-culture.[12] Given the community's population within the Air Force it can be concluded that the AERE officer is responsible for leading and influencing a large portion of the Air Force. As such, the AEM culture, and more specifically the AERE culture, as its leaders, merits examination.

Originally, the aim of this paper was to characterize leadership in the AEM community. However, it became clear, due to the dearth of research data and anecdotal documentation pertinent to the AEM community, and support more generally, that a more basic and fundamental approach would be appropriate to address the issues of culture and leadership. It is the author's intent that this paper could serve as a foundation for much

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[10]English, and Westrop, *Canadian Air Force: Leadership and Command*…, 157.

[11]Department of National Defence, B-GA-400-000/FP-000 *Canadian Forces Aerospace Doctrine*, 45.

[12]Based on statistics obtained from 1 April 2008 PeopleSoft data; received via e-mails from Maj N. Tremblay, Director Force Planning and Program Coordination (DFPPC) 4-4; dated 18 April 2008 and 22 April 2008.

needed future research in this area. This paper examines the concepts of culture and leadership, specifically with respect to the AERE community, in view of AERE officers as the leaders of the greater AEM community. A grasp of a group's culture is a key element to understanding the evolution of its leadership, and the development of its leaders. It is not proposed that the AERE community is a distinct culture which is at odds with its overarching military and Air Force cultures, but it is a culture that is unique and complementary.

This paper will focus specifically on the AEM community, primarily the AERE officer, as a distinct culture within the Air Force, and the effects of the culture on leadership and leader development. Therefore, the aim of this paper is to determine whether the requirement for leadership in the AERE culture differs from the rest of the Air Force officer population, primarily aircrew, by examining the AERE culture in comparison to the greater military culture, its cultural origins, its homogeneity or heterogeneity as a culture, and the consequence of these variables on its leadership. This will be done in five separate chapters.

First, Chapter 2 will discuss the theoretical concepts of organizational culture, how culture originates in an organization, and common conceptions of military culture as a profession. Chapter 3 will examine the AEM culture against the theoretical foundation established in the preceding chapter, through a discussion of its place in the broader Air Force culture; its origins, values, beliefs and assumptions; and finally, its sub-cultures. Chapter 4 will provide the reader with an overview of common leadership theories, and the differences between leadership, management, and command in the context of the military. Chapter 5 will examine AERE and pilot leadership development as well as its

resultant effects on leadership and command; pertinent Air Force leadership studies; and, will conclude with an analysis of the leadership tendencies of the AERE culture, and its constituent sub-cultures, using transformational and transactional leadership. The paper will then provide conclusions and recommendations for future research or examination.

CHAPTER 2: CULTURE – ONE SIDE OF THE COIN

The concept of culture typically connotes images of anthropologists and sociologists discovering new and exotic examples of undiscovered peoples; however, culture is more pervasive than that image. It is widely accepted amongst theorists that every organization has a culture.[13] However, culture is an abstract concept that can be thought of in various ways, but primarily and simply, as something an organization "has" or something an organization "is."[14] To better understand the concept of culture it is necessary to define it. Schein defines the culture of a group as:

> …a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.[15]

Schein describes culture as a concept that is more than just "shared" beliefs and traditions. Culture provides critical elements including: structural stability, where the culture still exists if members depart; depth where culture is an intangible aspect of the group, something that cannot be readily grasped, but that is accepted by the membership; breadth of the culture transcends all aspects of an organization or a group including its

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[13]Lt Col Lynne E. Vermillion, "Understanding the Air Force Culture" (Montgomery: Air War College Research Report, 1996), 5.

[14]Vermillion, "Understanding the Air Force Culture", 5.

[15]Schein, *Organizational Culture and Leadership*. 3rd ed., 17.

operations, regardless of area of employment; and patterning or integration, the essence of culture which satisfies the basic human need for order.[16]

The CF's leadership doctrine keystone document *Conceptual Foundations* defines the term culture similarly to Schein:

> A shared and relatively stable pattern of behaviours, values, and assumptions that a group has learned over time as an effective means of maintaining internal social stability and adapting to its environment, and that are transmitted to new members as the correct ways to perceive, think, and act in relation to these issues.[17]

The examination of the elements of a culture suggests that there are different levels or depths of culture against which an organization can be analyzed. Schein proposes three different levels of culture: artifacts, espoused beliefs and values, and underlying assumptions. Artifacts are typically those things that one can visibly observe about a culture such as its symbols, structure, language, ceremonies and rituals and its members' mannerisms and interaction. Examples of artifacts within the AEM community are trade badges, acronyms or jargon unique to the group, and the overarching airworthiness structure that drives how aircraft maintenance activities are conducted. Schein cautions that at this level, from these observable and overt indications, it is extremely difficult to determine the underlying assumptions of the group and it is necessary to delve further in order to make an accurate assessment.[18]

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[16]Schein, *Organizational Culture and Leadership*. 3rd ed., 14-15.

[17]Department of National Defence. A-PA-005-000/AP-004 *Leadership in the Canadian Forces: Conceptual Foundations* (Kingston: The Canadian Defence Academy, 2005), 129.

[18]Schein, *Organizational Culture and Leadership*. 3rd ed., 25-27.

Espoused beliefs and values typically originate with the individual who is a founding leader of the group. Over time, their beliefs and values may be adopted as those of the group or organization, and may even evolve into the more basic assumptions of the group. On the other hand, however, Schein makes a distinction between those beliefs and values that are espoused solely as aspirations for the future rather than in congruence with the organization's basic underlying assumptions.[19]

Basic underlying assumptions are the most fundamental level of a culture or the ""genes" in the cultural DNA."[20] It is the level from which future behaviour can be most accurately predicted in comparison to the previous two, more superficial, levels of culture. These shared assumptions have become taken for granted and "tend to be nonconfrontable and nondebatable, and hence are extremely difficult to change."[21] It is the examination of the underlying assumptions that will allow for a better understanding of AEM culture.

Why is culture important to an organization?

There are several reasons that theorists postulate why it is important to understand the culture of an organization.[22] Schein argues that "the only thing of real importance that leaders do is create and manage culture...the unique talent of leaders is their ability to

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[19]Schein, *Organizational Culture and Leadership*. 3rd ed., 28-30.

[20]*Ibid*., 21.

[21]*Ibid*., 31.

[22]Vermillion, "Understanding the Air Force Culture," 15.

understand and work with culture..."[23] Given the preceding statement it is therefore essential to the leaders of an organization that they understand the concept of culture. Additionally, a comprehension of culture allows for the reasonable and accurate prediction of future behaviour as suggested in Schein's examination of underlying basic assumptions. Culture guides the behaviour of the members of the organization by establishing a set of structures, routines, rules, and norms. Furthermore, culture is the most visible and identifiable aspect of an organization, which influences personnel both internal and external to the organization regarding their perceptions of that culture.[24] It therefore behoves leaders of an organization to be aware of and work within the culture to bring about successful change and effective performance. Although military culture has been the subject of numerous studies and writings, the aspect of culture is not a topic that typically resonates with the average CF member, but perhaps one with which they should be conversant.

How does a culture originate?

As the definitions of culture suggest, it is something that develops over time through the adoption of practices that have proven successful by adapting to the external environment. Shein posits that a group is a social unit whose "members have a shared history."[25] Group formation can be attributed to either an "originating event" triggered by an occurrence requiring a common response, by a leader or founder bringing people

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[23]Schein, *Organizational Culture and Leadership*. 3rd ed., 11.

[24]Vermillion, "Understanding the Air Force Culture," 15.

[25]Schein, *Organizational Culture and Leadership*. 3rd ed., 11.

together for a common purpose, or by attracting individuals to a common experience.[26] Ott cites three sources of culture including the broader culture to which the organization is exposed, the nature of the organization's business, and the founders'or leaders' values, beliefs, and assumptions.[27] Using Ott's framework in the context of the AERE community one can see the profound influence the military culture has on the foundation and sustainment of the AERE culture.

The evolution of the culture determines its strength which is dependant on the length of time the group has existed, the stability of its membership, and the intensity of shared experiences.[28] It is accepted amongst theorists that an organization's culture is the result of founding members' or leaders' vision, beliefs, and values that over time become the shared vision, beliefs, and values of the group, the result of patterns or behaviours of a group. It is through the process of socialization that new members are inculcated into or taught about the culture.[29] Socialization is a social learning process occurring in various ways including the recruiting process, and more specifically in the military through basic and occupational training.

Generally speaking, these aforementioned socialization methods only address the superficial elements of the culture. It is only through 'time in', or exposure to the culture, that the deeper shared assumptions are learned. Within the AEM community, specifically the AERE group, this socialization begins in basic training, as will all military personnel.

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[26]Schein, *Organizational Culture and Leadership*. 3rd ed., 65.

[27]Steven J. Ott, *The Organizational Culture Perspective,* (Chicago: The Dorsey Press, 1989), 74.

[28]Schein, *Organizational Culture and Leadership*. 3rd ed., 11.

[29]Ott, *The Organizational Culture Perspective*, 89-90.

In terms of the specific AERE culture, the deeper socialization process begins prior to basic occupational training, with the AERE Phase Training (APT) program during which AERE candidates are exposed to personnel at different levels of the organization, including Non-Commissioned Members (NCMs) and Non-Commissioned Officers (NCOs).

Cultural Homogeneity – Sub-cultures

The majority of theorists acknowledge that a culture is not entirely homogeneous. Typically within a culture there are identifiable sub-groups or sub-cultures. Certainly, the existence of these sub-cultures is acknowledged within the military, as evidenced in CF leadership doctrine which recognizes the Army, Navy and Air Force as distinct cultures.[30] Within these cultures there are further sub-cultures. Van Maanen and Barely define sub-culture as:

> A subset of an organization's members who interact regularly with one another, identify themselves as a distinct group within the organization, share a set of problems commonly defined to be the problems of all, and routinely take action on the basis of collective understandings unique to the group.[31]

Hatch states "[t]he sub-culture view opens up the concept of organizational culture with about the same effect as the opening of Pandora's box in Greek mythology. Once the box is opened, we must live with the chaos we have unleashed."[32] This is,

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[30]Department of National Defence, A-PA-005-000/AP-001 *Duty with Honour*…, 53.

[31]John Van Maanen and Stephen R. Barley, "Cultural Organizations: Fragments of a Theory," in *Organizational Culture*, ed. P.J. Frost, L.F. Moore, M.R. Louis, C.C.Lundberg, and J. Martin, 3-54 (Beverly Hills: Sage, 1985): 38, quoted in Mary Jo Hatch, *Organization Theory: Modern Symbolic and Postmodern Perspectives* (Oxford: Oxford University Press, 1997), 226.

[32] Mary Jo Hatch, *Organization Theory: Modern Symbolic and Postmodern Perspectives*, (Oxford: Oxford University Press, 1997), 226.

perhaps, an alarmist view. The concept of sub-cultures needs to be considered by military leaders, to acknowledge their existence and better appreciate their effects on the broader culture.

The concept of sub-cultures depends on the frame of reference. That is to say, the Air Force could be considered a sub-culture within the greater military culture, and the AEM community could be considered a sub-culture within the greater Air Force community. The context of military sub-cultures is best categorized as "to whether they support, deny, or simply exist alongside the dominant values of the overall culture."[33] Martin proposes the three perspective model that can be taken in the study of cultures and sub-cultures including: integration, differentiation, and fragmentation.[34] In the integration perspective, the organizational culture is shared by all members of the group and is unified through consensus. The differentiation perspective promotes the existence of sub-cultures, highlighting a less unified culture, but the sub-cultures in themselves are

concepts of the military as a profession and the profession of arms. From a review of related literature Harries-Jenkins offers that there are two distinctive and widely accepted models of military professionalism: the *Profession of Arms*, and the *Pragmatic Military Profession*.[36] Though these models date back to the late 1950's and early 1960's, the concepts are still as valid today, and form the basis for research for present day sociologists studying the military.

The Profession of Arms

Samuel P. Huntington, in his 1957 seminal work *The Soldier and the State*, introduces the concept which is characterized as the *Profession of Arms*. Huntington's concept centres exclusively on the premise that the unique skill of the military profession is the "management of violence" which sets it apart from the rest of society.[37] For this reason, Huntington's model is characterized as being the traditional model as it is closely associated with the historical image of the heroic-warrior.[38] Huntington defines a profession by its expertise, responsibility, and corporateness.[39] It is the application of these three characteristics in the context of the military that make the military culture unique. The expertise is acquired by a structured education and experience, and is founded in history and cultural tradition.[40] The skill to be mastered in the military profession is the application of violence, and the degree to which one is capable of

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[36]Harries-Jenkins, *Professional Groups and Subgroups*…, 15.

[37]Samuel P. Huntington, *The Soldier and The State: The Theory and Politics of Civil-Military Relations,* (Cambridge: The Belknap Press of Harvard University Press, 1957), 11.

[38]Harries-Jenkins, *Professional Groups and Subgroups*…, 24.

[39]Huntington, *The Soldier and The State*..., 8.

[40]Huntington, *The Soldier and The State*..., 8.

effectively directing, operating, and controlling a military unit is based on the individual's level of expertise and competence. Taken to its logical conclusion, then, Huntington infers that there are varying degrees of professional competence within the military culture. This is by virtue of the fact that some officers are employed in trades that are more directly involved in the direct 'management of violence,' such as combat arms, which are closest to the heart of Huntington's conception of the military profession. It is this preoccupation with the 'management of violence' that creates an aspect of exclusivity of membership to the military profession, and can be argued creates a tiered culture between operator and support communities. This is a unique aspect of the military profession and culture.

The aspect of responsibility is values-based and moralistic in nature, and is related to the professional working in the service of society and not for financial gain.[41] The military professional's behaviour towards the state is governed by overarching rules, customs, and traditions indicative of a culture. It is the application of the characteristics of expertise and social responsibility that combine to create a sense of unity or a unique corporateness. The military corporateness is demonstrated through the acceptance of only a certain calibre of people through the recruiting process, and a hierarchy of ranks that are based on level of competence not by virtue of office.[42]

The Pragmatic Military Professional

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[41]Huntington, *The Soldier and The State…*, 9-10.

[42]*Ibid*., 6-18.

In his 1960 defining work, *The Professional Soldier*, Morris Janowitz contrasts Huntington's traditional model with the concept of the "professionalisation" of the military.[43] This model acknowledges that the military as a profession is dynamic and the characteristics of the military professional change over time to align with the transformation of the parent society by adopting civilian norms resulting in reducing the difference in skill between military and civilian counterparts.[44] Janowitz, similar to Huntington's view, characterizes a profession by its skill, group identity and internal administration. The acquisition of skills through training permits the professional to provide a specialized service. Janowitz stresses that the concept of a profession goes beyond the specialized skills to the development of a group identity with system of internal regulation or code of ethics. This concept of group identity and code of ethics aligns with Schein's foundation for a culture.

Janowitz offers several basic hypotheses which account for a departure from the traditional view of the military profession: changing organizational authority, narrowing skill differential between military and civilians elites, shift in officer recruitment, significance of career patterns, and trends in political indoctrination.[45] Harries-Jenkins posits that the first four hypotheses are timeless and remain useful for modern day analytical purposes.[46] For the purposes of this paper and the study of the AERE culture the first two hypotheses have the most relevance, namely changing organizational

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[43]Harries-Jenkins, *Professional Groups and Subgroups*…, 4.

[44]*Ibid*., 3.

[45]Morris Janowitz, *The Professional Soldier,* (Glencoe: The Free Press, 1960), 8-13.

[46]Harries-Jenkins, *Professional Groups and Subgroups*…, 7.

authority and narrowing skill differential. With respect to the changing organizational authority, Janowitz suggests that the military has shifted from a primarily authoritarian organization to one based on principles of contemporary society founded on group consensus and persuasion.[47] This change undoubtedly had an effect on the culture and leadership approaches of the military. Regarding the narrowing skill differential between military and civilian elites, Janowitz attributes this directly to the increasing number of "technical specialists" in the military who perform tasks that have "direct civilian equivalents" including engineers and "machine maintenance specialists."[48] Janowitz cites the Air Force as a service with a greater tendency for employing technical specialists than the Army. As such, Janowitz's model is more inclusive than Huntington's traditional model in that it "goes beyond the direct management of violence."[49] It is this view that allows this model to be applied to those military personnel carrying out non-traditional/non-heroic warrior functions, i.e. beyond those employed in combat arms professions, such as the AERE community.

Janowitz states that "[t]he history of the modern military establishment can be described as a struggle between heroic leaders, who embody traditionalism and glory, and military "managers," who are concerned with the scientific and rational conduct of war."[50] However, he suggests that the military engineer or technologist does not perform either as a heroic leader or military manager but that they have a distinct function in the

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[47]Janowitz, *The Professional Soldier*, 8.

[48]*Ibid*., 9.

[49]Harries-Jenkins, *Professional Groups and Subgroups*…, 6.

[50]Janowitz, *The Professional Soldier*, 21.

military. Moreover, he suggests that these three roles need to be balanced within the military establishment and each role can adapt to hold crucial leadership roles in the military hierarchy.[51]

The heroic leader is closely aligned with the warrior image of Huntington's *Profession of Arms*; the military manager function encompasses the "scientific pragmatic and objective dimensions of war-making", and the military technologist is responsible for the development and introduction of innovative technologies.[52] Janowitz points out that it is the tendency of the military establishment to revert to the traditional model where the heroic leader is revered, can create an imbalance in the roles of the military manager and military technologist.[53] Despite the increased dependency on technology and "civilianizing" of the military establishment, Janowitz maintains that to differentiate the military profession from the rest of society that the "fighter spirit"[54] needs to persist, that is to say that military managers and military technologists need to be influenced by the traditions of the heroic leader.[55] It is interesting to note that though highlighted as a crucial role within the military establishment, the concept of the military technologist tends to become encompassed with that of the military manager into what Harries-Jenkins refers to as the "manager-technocrat."[56]

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[51]*Ibid*, 22.

[52]Harries-Jenkins, *Professional Groups and Subgroups*…, 30.

[53]Janowitz, *The Professional Soldier*, 24.

[54]Janowitz, *The Professional Soldier*, 31.

[55]*Ibid*., 35-36.

[56]Harries-Jenkins, *Professional Groups and Subgroups*…, 24.

Centre-Periphery Model

In his comparative analysis of the *Profession of Arms* and *Pragmatic Military Professional* models, Harries-Jenkins highlights the common concern both approaches pose to groups and sub-groups within the military which he couches in terms of the "combat warrior paradigm."[57] In both models, the combat function dominates as the factor which differentiates the military profession from civilian organizations. This premise creates challenges for groups/sub-groups/occupations within the military that are not directly involved in the application of violence, and suggests that there are varying degrees of military professionals by virtue of their employment. AERE falls into one of these sub-group categories. Harries-Jenkins offers the Army-centric "centre-periphery model" in which the combat-warrior sub-group forms the nucleus.[58] In practice the combat arms trades, pilots, and maritime surface and sub-surface officers fall into this category. The proximity of the other sub-groups to the centre is based on that sub-group's affiliation with the combat function.

On the periphery is found the non-combatant population within the military which is characterized by the duality of their professionalism. Doctors, dentists, nurses and lawyers fall into this category as members of the military profession. In this sub-group there is conflict between the military 'operational' ideology and the 'civilian' ideology.[59] The next sub-group to the perimeter of the model is the combat service specialists. There are close similarities between this sub-group and their civilian counterparts. It is this

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[57] Harries-Jenkins, *Professional Groups and Subgroups*…, 30.

[58] *Ibid*…, 30.

[59] *Ibid*…, 30.

relationship that gives the perception to peer groups at the centre of the model that this sub-group's level of military professionalism is diminished due to this civilian affiliation. Harries-Jenkins notes that at the senior levels the perception of differences may not be as eclipsed depending on individual's involvement in operational missions and exposure through advanced training courses.[60] Given the diminishing differences at the senior levels between those at the centre, Harries-Jenkins questions "whether a greater use can be made of the untapped potential inherent in these specialist members of the military."[61] The final sub-group is the combat support specialist, which is closely aligned with those as the centre of the model. However, despite the alignment with those in the centre sub-group a differentiation still remains where there is a perceived distinction between levels of military professionalism; in that those sub-groups outside of the nucleus enjoy lesser status as military professionals.[62] The centre-periphery model will be used to situate the AERE culture from a within the CF and the Air Force.

The Institutional/Occupational Concept

In the last several decades, especially since the 1960's, a considerable amount of study has taken place regarding military culture and its relationship to society; that said, the majority of the research has been focused on the United States (US) military. Perhaps the most controversial is Charles Moskos's Institutional/Occupational thesis, which was introduced in 1977 as a result of the US military transitioning from conscription to an all

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[60] Harries-Jenkins, *Professional Groups and Subgroups*…, 31.

[61] *Ibid*., 31.

[62] *Ibid*., 31-32.

volunteer force.[63] [64] Moskos observed significant changes occurring in the military, including the increasing number of non-combatant occupations, increasing bureaucracy mimicking civilian organizations, and increasing similarities between military and civilian occupation skill sets.[65] He proposed that the military was transforming from an institutional organization, one that is values-driven and based on the greater good, to an organization or culture that was more occupational, or demonstrating civilian characteristics and more focused on self-interest than that of the larger group.[66] Moskos and Wood maintain that the tendency towards occupationalism affects military effectiveness along three key areas: mission performance, member motivation, and professional responsibility.[67] These issues still hold relevance in the military today and the I/O model is still widely referred to in recent research. Researchers highlighted this organizational trend to ensure that military leaders could take necessary steps to establish a better balance between the two models. Institutional/Occupational (I/O) research in the military found that there were I/O differences between the services and branches within

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[63]Donna Winslow, "Canadian Society and Its Army," *Canadian Military Journal* 4, no.4 (Winter 2003-2004): 14.

[64]Charles C Moskos and Frank R. Wood, *The Military: More Than Just a Job?* (Washington: Pergamon-Brassey's International Defense Publishers, Inc., 1988), 3.

[65]Karen D. Davis, "Culture, Climate and Leadership in the Canadian Forces: Approaches to Measurement and Analysis," in *Dimensions of Military Leadership, Vol 1*, ed. MacIntyre, Allister and Karen D. Davis, 311-336 (Kingston: Canadian Defence Academy Press, 2006), 316.

[66]Charles C. Moskos, "From Institutional to Occupation: Trends in Military Organization," *Armed Forces and Society* 4, no. 1 (Fall 1977): 41-42.

[67]Moskos and Wood, *The Military*…, 4.

the services as well as intra-service between officers and NCMs, and technical and non-technical branches.[68]

One of the areas of controversy regarding the I/O theory was and still is the perceived increasing occupationalism of the military and the associated perception of it undermining military professionalism.[69] Since the late 1950s and early 1960's, sociologists including Samuel Huntington and Morris Janowitz had acknowledged a shift within the military profession, which Janowitz described as the "civilianization of the military."[70] As a rebuttal to Moskos's original I/O thesis, Janowitz argued that the conceptualization of the change Moskos was promoting was more accurately described as a transition of the military from a profession, versus an institution, to an occupation.[71] A profession is characterized by its members' high level of skills, its ability to self-regulate, and its strong organizational or group cohesion.[72] Based on this definition, Janowitz challenged Moskos's thesis in that significant changes would have to take place to truly compromise the military as a profession, but acknowledged the long-term transformation of the military and its increasing interdependence with society.[73]

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[68]Charles C. Moskos, "Institutional and Occupational Trends in Armed Forces," in *The Military: More Than Just a Job?* ed. Charles C Moskos and Frank R. Wood, 15-26 (Washington: Pergamon-Brassey's International Defense Publishers, Inc., 1988), 24.

[69]Moskos and Wood, *The Military*…, 5.

[70]Morris Janowitz, "From Institutional to Occupational: The Need for Conceptual Clarity," *Armed Forces and Society* 4, no. 1 (Fall 1977): 53.

[71] Frank Wood, "At the Cutting Edge of Institutional and Occupational Trends: The U.S. Air Force Officer Corps," in *The Military: More Than Just a Job?* ed. Charles C Moskos and Frank R. Wood, 27-38 (Washington: Pergamon-Brassey's International Defense Publishers, Inc., 1988), 29.

[72]Janowitz, "From Institutional to Occupational…," 52.

[73]*Ibid*., 53.

The American officer, behavioural scientist, and a collaborator with Moskos, Frank R. Wood, focused his I/O research primarily on the United States Air Force (USAF). He found that due to the Air Force's dependence on technology that the service and its officer membership were more likely to specialize and experience a "diffused sense of purpose", therefore a greater susceptibility for "occupationalism."[74] This "diffused sense of purpose" can undermine the strength of a culture, resulting in a culture that is differentiated or fragmented. Woods assumed that pilots would more closely align to the institutional model, given their proximity to the mission or 'pointy end of operations', but his findings proved that pilots had a greater tendency to identify as specialists; in keeping with the occupational concept. Furthermore, he found that support officers related their being officers or part of the institution to their management responsibilities, which accords to Moskos's occupational concept rather than the institutional model.[75]

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[74]Wood, "At the Cutting Edge of Institutional and Occupational Trends…," 27.

[75]Moskos and Wood, *The Military*…, 7.

CHAPTER 3: AERE CULTURE

There are certain mind sets among those who work on aeroplanes. The culture of the work place determines how things get done. Understanding the culture is the key to understanding ground crew.[76]

Brigadier-General H. Sutherland

The creation of a culture is influenced by several variables including the broader culture in which it exists, its historical origins, the influence of its founders and leaders, and the nature of its business.[77] This examination will follow a tiered and hierarchical approach in analysing the AERE culture. It will present the influences of the overarching military and Air Force cultures, the origins of the AEM culture; of which AERE is a subset, the influence of its founders/leaders, the cultural beliefs, values and assumptions, and the existence of sub-cultures within the AERE culture.

Influence of the Broader Culture

Overarching Culture

The AERE occupation and the Air Technician (Air Tech) trades, the AEM community as a whole, identifies with the Air Operations (Air Ops) branch.[78] The branch also consists of pilot, navigator, air traffic and air weapons control officers. The grouping of occupations by branches allows "members of the Canadian Forces in related

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[76]Herbert Sutherland, "Saturday's Children: The Story of People Who Look After Airplanes," [Unfinished Manuscript, 1998], 17.

[77]Vermillion, "Understanding the Air Force Culture," 19.

[78]Department of National Defence. CFAO 2-10 *Personnel Branches within the Canadian Forces* (Ottawa: DND Canada, 1986), Annex A.

occupations to identify with each other in cohesive professional groups. These groups are based on similarity of military roles, customs, and traditions."[79] The Air Force is unique in the identification of an Operations branch. In contrast, the Army's traditional operational or combat arms occupations, including infantry, artillery, and armoured, identify as separate and distinct branches.[80]

Encompassing the AERE community as part of the Air Ops branch, in effect, takes a wider Janowitzian *Pragmatic Military Professional* approach by including occupations that "go beyond the direct application of violence" into a branch that is focused on operations.[81] This identification of AERE as part of the Air Ops branch takes a view which acknowledges the importance and parity of the 'technical specialist' alongside the traditional 'heroic leader'.

However, a closer examination of the phrase "similarity of military roles" in the context of the Air Ops branch reveals a slightly divergent view. The role of the AERE officer is distinctly different from the role of aircrew, specifically pilot officers, which is acknowledged in CF Aerospace Doctrine. The doctrine categorizes maintenance operations, or more specifically aircraft maintenance, as an "operational support" function which provides "services that directly support air operations."[82] It is a function distinct from administrative or logistical support provided by the logistics (LOG),

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[79]Department of National Defence. CFAO 2-10 *Personnel Branches within the Canadian Forces*.

[80]*Ibid*., Annex A.

[81]Harries-Jenkins, *Professional Groups and Subgroups*…, 6.

[82]Department of National Defence, B-GA-400-000/FP-000 *Canadian Forces Aerospace Doctrine*, 45.

communications and electronics engineering (CELE) communities. However, the draft Air Force Personnel Doctrine identifies two principal personnel groupings: operators and non-operators. It states "[i]n general, the operators (aircrews) will be the war fighters who are required to fly air missions."[83] In essence, all other occupations and trades that are not classified as aircrew are part of the non-operator category. In the context of Huntington's traditional model of the *Profession of Arms*, aircrew, particularly pilots, are involved in the direct 'management of violence' and fit the warrior image. In contrast, in the conduct of their typical duties AERE officers are not involved in the direct 'application of violence.' This doctrinal distinction between operators as war fighters and support functions as non-operators, takes a Huntingtonian view of the military profession. This dichotomous relationship between the AERE community as part of the Air Ops branch, and the function it provides classified as non-operator, or support, has prompted consideration to the creation of a unique AERE branch.[84]

In situating the AERE community on the Harries-Jenkins's centre-periphery model the function it fulfils has to be considered. Though the AERE occupation shares some commonality with civilian professions such as professional engineers, its maintenance operations branch distinguishes it from an engineering-centric function. As such, the focus on direct support to operations through the maintenance of weapon systems used by the 'war fighters' differentiates it from other Air Force officer

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[83]Department of National Defence, *Air Force Personnel Doctrine DRAFT* (Ottawa: DND Canada, 07 March 2008), 9.

[84]The concept of AERE as a unique branch was brought forward by the AERE Council in November 2004 (as recorded in AERE Council Meeting minutes dated 4 Nov 04). However, this initiative was superseded by the Military Occupational Structure Analysis, Redesign, and Tailoring (MOSART) Project which has since been disbanded.

classifications, such as Log and CELE. Thus, the AERE culture occupies the combat-support specialist category as depicted in Figure 3.1. The perception of various classifications in the broader military context, using concepts such as those proposed by Huntington, Janowitz, and Harries-Jenkins, contributes to the heterogeneity of the military and the distinction between sub-cultures, such as operations and support, in doctrine and practice.

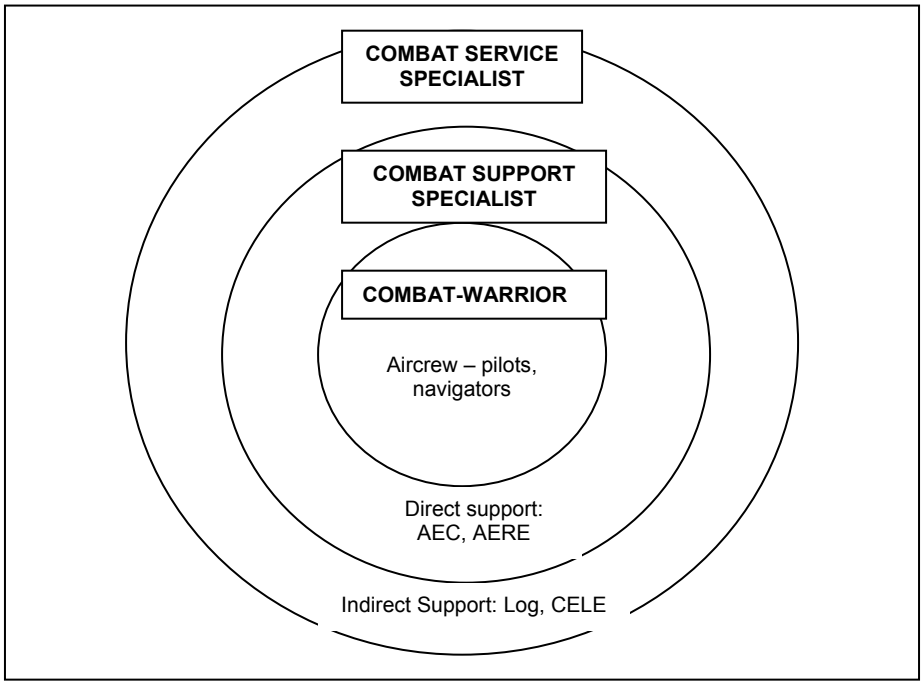

Figure 3.1 – AERE Culture in the Context of Harries-Jenkins' Centre Periphery Model

Source: Maj R.A. Evans' depiction of Harries-Jenkins' Centre Periphery Model introduced in *Professional Groups and Subgroups in the Contemporary Military*, 30.

The Influence of the Air Force Culture

The AERE community is shaped by its existence within the larger Air Force culture. Air Force characteristics, values, and the nature of its business directly influence

the AERE sub-culture. The Air Force is highly dependent on technology to achieve its mission, which mandates a requirement to employ highly skilled individuals such as AERE officers and Air Technicians (Air Techs).[85] This dependence on technology drives higher educational prerequisites and training for AERE officers, as compared to pilots.[86]

The Canadian Air Force is based on three core values: professionalism, excellence, and teamwork.[87] These same values are reflected in both the maintenance operations and engineering support domains of the AERE community, represented by 1 Canadian Air Division A4 Maintenance (1 Cdn Air Div A4 Maint), and Director General Aerospace Equipment Program Management (DGAEPM) respectively. 1 Cdn Air Div A4 Maint's three values are identical to the Air Force values, and DGAEPM's values are articulated as trust, integrity, excellence, teamwork, and accountability.[88] [89] The value of teamwork is key and pervasive throughout the 'business' of the Air Force and the AEM community. Relationships between operators and non-operators are "forged on competency and trust."[90] This is especially true of the relationship between the aircrew

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[85]Department of National Defence, *Air Force Personnel Doctrine DRAFT*, 7.

[86]The Aerospace Engineering Occupation Specification (OS) specifies that educational requirements for AERE officers are a baccalaureate degree in an engineering or science discipline. In contrast, the Pilot OS specifies "minimum education for enrolment." CFAO 9-12 – Regular Officer Training Plan, Annex A, which expands on the educational requirements, includes Arts degrees as acceptable for the pilot occupation.

[87]Air Force Website, "Missions and Roles," http://www.airforce.forces.gc.ca/site/purpose/today1_e.asp; Internet; accessed 5 Apr 08.

[88]1 Canadian Air Division A4 Maintenance, "About Us," http://winnipeg.mil.ca/a4maint/Organization/aboutus_e.htm; Intranet; accessed 4 April 2008.

[89]Director General Aerospace Equipment and Program Management, "About Us," http://dgaepm.ottawa-hull.mil.ca/subsites/en/about_us_e.asp; Intranet; accessed 4 April 2008.

[90]Department of National Defence, *Air Force Personnel Doctrine DRAFT*, 13.

and AEM communities, where aircrew trust that the technicians are "trained, qualified and formally authorized" to conduct the work.[91] Similarly, aircrew trust that the AERE officers leading the maintenance organization are competent in managing maintenance operations to ensure mission ready aircraft are available for flying operations.

The Air Force 'business' of flying aircraft is predicated on a culture of safety "to prevent accidental loss of aviation while accomplishing the mission at an acceptable level of risk."[92] This emphasis on safety is a 'basic underlying assumption' of the culture as a whole, and has been "internalized" by Air Force membership.[93] It is evident as visible cultural 'artifacts' in the articulation of the CF Flight Safety Program and the DND/CF Airworthiness Program. This culture of safety is inherent in the AEM community through the Technical Airworthiness Program, a program which is predicated on the principles that airworthiness activities are "completed to accepted standards, performed by authorized individuals, accomplished within accredited organizations; and done using approved procedures."[94] Moreover, this focus on safety manifested into an emphasis on quality through the AF9000 Plus program which establishes "…a Quality Standard…for implementation in all areas of engineering and maintenance."[95]

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[91]Department of National Defence, C-05-005-P02/AM-001 *Aerospace Engineering and Maintenance Program Management* (Ottawa: DND Canada, 2006), 5-1.

[92]Department of National Defence, A-GA-135-001/AA-001 *Flight Safety for the Canadian Forces* (Ottawa: DND Canada, 20 March 2007), 1-1/6.

[93]Department of National Defence, *Air Force Personnel Doctrine DRAFT*, 15.

[94]Department of National Defence, C-05-005-001/AG-001 *Technical Airworthiness Manual*, (Ottawa: DND Canada, 2003), 1-1-1-4

In summary, the AEM and AERE cultures have been and continue to be greatly influenced by the Air Force culture. That said, there is also a clear distinction between roles and functions within the Air Force that influence the development of its sub-cultures. BGen Herbert Sutherland, former DGAEPM and AEM leader, succinctly encapsulates the duality of the cultures within the Air Force:

> It must be recognized that there are two solitude's within the air force. There is the largely commissioned warrior class and the largely non-commissioned support crew who provide most of the sweat and labor. They are treated differently, and have different goals and aspirations. Everybody in the service takes pride in the operational accomplishments of their air force. The support people rightly see themselves as part of the operation. There is always a feeling of disappointment and anger when the official histories are published and the existence of a support organization is ignored.[96]

The History of the AEM/AERE Culture

As Schein suggests, a culture can be borne out of an "originating event" and evolves through the "shared history" of an organization.[97] Though the AEM and AERE cultures are part of the larger military and Air Force culture, they are distinct. As such, it is necessary to discuss the origins of the AEM culture through an examination of its history. In contrast to the larger military or Air Force culture, about which a great deal of historical information exists, the documentation of the origins and subsequent history of the AEM community is scarce. This is noted by both Pletsch in her thesis, *The Guardian*

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[95]Department of National Defence, C-05-005-P11/AM-001 *A Quality Standard for Aerospace Engineering and Maintenance (QSAEM),* (Ottawa: DND Canada, 1999), Part 1; http://winnipeg.mil.ca/A4AQM/AF9000/P11_e.htm; Intranet; accessed 4 April 2008.

[96]Sutherland, "Saturday's Children…," vii.

[97]Schein, *Organizational Culture and Leadership*. 3rd ed., 11 and 65.

Angels of this Flying Business,[98] and by the late BGen H. Sutherland, in his unfinished and unpublished manuscript, *'Saturday's Children': The Story of People Who Look After Airplanes*.[99]

The origins of the AEM community are aligned with the birth of aviation in the military in 1911 with the Royal Flying Corps (RFC). At that time, flying officers were expected to carry out some technical duties, including supervision of technical airmen. The trade structure for technical airmen was uncomplicated with two main trades: riggers, who were responsible for the maintenance of aircraft airframes, and fitters, who were responsible for the maintenance of propulsion systems. The terms 'rigger' and 'fitter' are still in use today in the AEM jargon. The technician figures prominently in what little history exists regarding groundcrew, but the origins of the AERE trade are not as evident.

The requirement for Flight Commanders to carry out technical duties persisted until World War II. It is interesting to note that the AERE trade, or non-operator, found its beginnings in tasks that were the responsibility of flying officers, or 'operators.' Over time, and due to attrition of flying officers during World War I, these tasks migrating to

officers receive technical training as a prerequisite for progression, a policy that was subsequently adopted into RCAF doctrine.[101]

The Canadian Air Board was established in 1919, as a focal point and regulatory institution for all commercial and military aeronautical issues. These included aeronautical regulations, related infrastructure, the control and management of equipment and technical research. With the establishment of the Air Board came the requirement to hire a technical officer to provide oversight of the airworthiness of aircraft, and recommendations regarding the procurement of new aircraft and equipment.[102] LCol E.W. Stedman, a man of impressive credentials with the British Air Ministry as Deputy Controller of Technical Development and Deputy Director of Design, was hired into this position.[103] Thus, Stedman became a prominent figure in early AEM/AERE history, and can be regarded as the founder of its culture.

As the Air Force evolved during the interwar years, 'career' flying officers were expected to have an education, including engineering, in recognition of the technical demands of an air force. Consequently, pilots were recruited from the Royal Military College (RMC), or applied science programs at civilian institutions; a policy that was championed by Stedman.[104] After a period of operational service, the majority of flying officers received specialized in-service training in engineering, signals, armament, or navigation, following which they would alternate their specialist tours with general

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[101] *Ibid*., p.52.

[102] *Ibid*., 58-59.

[103] Sutherland, "Saturday's Children…," 75.

[104] *Ibid*., 23.

duties.[105] [106] It was those individuals, who earned the engineering specialty, or the RAF "E" designation, who supervised engineering and maintenance in the field. Though it was the policy of the time that all RCAF officers would be flying officers; there was a cadre of non-aircrew officers, including Stedman, who were civilian trained professional engineers. These individuals were targeted for post-graduate training to carry out development and airworthiness functions at the headquarters level. [107]

In 1928, Stedman documented four distinct branches in the aeronautical engineering profession: experimental aeronautics, aircraft construction, aircraft engine construction, and aircraft operations.[108] He assessed that the first three branches required specialized engineering skills, and further espoused the belief that those involved in aircraft maintenance operations required a foundation in engineering:

> There are so many phases in the operation of aircraft that call for the services of trained engineers, that there can be little doubt that the whole operation of aircraft must be regarded as closely allied to the aeronautical engineering profession…The lives of the crew and of passengers depend upon the correctness of the engineering decisions they make, and for this reason pilots of aircraft on detached operations need to be trained engineers.[109]

The separation of maintenance and engineering responsibilities from the purview of the pilot officer was a product of the exigencies of World War II. In order to "relieve flying personnel of responsibility for the custody and servicing of aircraft, and the

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[105] *Ibid*., 85.

[106] *Ibid*., 185.

[107] *Ibid*., 124.

[108] Wing Commander E.W. Stedman, "Training Aeronautical Engineers," *Canadian Aviation* 1, no.1 (June 1928): 26.

[109] Stedman, "Training Aeronautical Engineers," 3.

administration of servicing personnel, thus permitting flying personnel to devote their time to operational training and flying," centralized servicing wings were introduced under the responsibility of Engineering Officers.[110] After World War II the evolution of the engineering officer to the present day is largely unrecorded. What is known is that aeronautical and aircraft engineering type officers existed in the Army, Navy, and the Air Force. During unification of the three services in 1968, a single officer classification, the Aerospace Engineer (AERE), was created as part of the Air Ops branch for the maintenance of all military aircraft.[111]

It becomes increasingly evident in the examination of the little history that exists regarding the aircraft engineering officer that there were two distinct groups: one that finds its beginnings in the technical responsibilities assigned to flying officers, and the other finds its genesis in the professional aeronautical engineer. It is with these two unique groups that the origins of the present day's maintenance operations and engineering support domains of the AERE culture can be traced.[112]

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[110] Pletsch,""The Guardian Angels of this Flying Business"…", 90.

[111] AERE Course 7901. *Class Project – AERE History*. (Canadian Forces Base Borden: file 4640-2574-83(AERE), 11 February 1980), 10.

[112] It is acknowledged that for the purposes of Career Management that four employment areas are specified for the AERE occupation. They include: maintenance operations, maintenance support staff, engineering management, and other staff. However, the author maintains that the AERE community is best typified with the domains of maintenance operations, or those in the field that provide direct support to operations; and engineering support, those who provide indirect support to operations; typically those employed in Weapon System Management (WSM) roles and specialized engineering functions in DGAEPM.

The Influence of Founders and Leaders

As organizational culture theorists suggest, the founders or early leaders of a culture have a significant effect on the establishment and development of the culture. It is their beliefs, values, vision, and personality that shape the culture. The name that persists in the history of the Air Force engineering community is that of Air Vice-Marshal Stedman. The beliefs and philosophies that he introduced in his twenty four year Canadian military career as the Air Board's first Director of Technical Services pervaded through the history of the Air Force to shape what has evolved into the AERE culture. [113] Stedman is known as the "founder of military aeronautical engineering in Canada."[114] He was subsequently recognized for his contribution to AEM history with the Canadian Forces School of Aerospace and Technical Engineering (CFSATE), in Borden, Ontario named in his honour. However, despite his significant contributions to the Air Force and aerospace engineering he is largely forgotten in Air Force teachings of its influential leaders.

As previously mentioned, Stedman was a prominent figure in the early development of the RCAF. His legacy is most profound in the area of educational requirements. His establishment of educational requirements for Provisional Pilot Officers, who, in his own words: "resulted in an intake of very fine officers who… occupy the senior positions in the Royal Canadian Air Force."[115] These early policies

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[113] Ernest W. Stedman, *From Boxkite to Jet: Memoirs of Air Vice-Marshal Ernest W. Stedman*, (Toronto: University of Toronto Press, 1963), Foreword.

[114]Sutherland, "Saturday's Children…," 73.

[115]Stedman, *From Boxkite to Jet*…, Laying Defense Foundations.

shaped the future leaders of the RCAF, and continue to influence the development of leaders of the AERE community today. The AERE occupation enjoys the most robust post-graduate (PG) program in the CF with 78 positions; accounting for approximately 15% of the total number of PG designated positions. The occupation with the next highest amount of PG positions is Maritime Engineer (MARE) with 45 billets. In contrast, Air Force operators, pilot and navigators, only hold 32 positions.[116] Thus, as the founder, Stedman's focus on engineering expertise and specialization has influenced the evolution of the AERE culture.

Values, Beliefs, and Assumptions

The AERE culture's values, beliefs, and assumptions were influenced by the broader military and Air Force culture and the more specific views of early leaders. The belief that has become taken for granted, and underpins Air Force culture, is its reliance on technology.[117] This assumption shaped the thinking of leaders, such as Stedman, who believed that "as the Air Force was essentially a technical service" its officer membership should be requisitely educated to deal with the challenges of a technical service.[118] This educational requirement has persisted to present day for the AERE classification with the

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[116]Based on 1 Apr 08 PeopleSoft data obtained by e-mail through Maj. N. Tremblay, Director Force Planning and Program Coordination 4-4, from Maj K. Currie, In Service Selection, Director of Military Careers Administration 5, dated 21 April 2008.

[117]Ott, *The Organizational Culture Perspective,* 47.

[118]Stedman, *From Boxkite to Jet*…, Laying Defense Foundations.

recruitment of individuals who hold or will hold a baccalaureate degree in an engineering or science discipline.[119]

Stedman's belief in the importance of engineering, specialization, and education laid a foundation upon which other beliefs and values were built through the development and maturation of the AERE culture. The AERE Council, as the most senior body of the community, has defined the espoused beliefs and values of the AERE community. The values are: military ethos, versatility, adaptability, and diversity.[120] These values have not been articulated to the larger AERE community; consequently, they do not provide a good basis for examination. Notwithstanding, the AERE culture's core competencies: Leadership, Engineering, Operations (LEO), have been widely promulgated; thus, provide a better basis for examination.[121]

The core competencies were introduced in the late 1990's, by BGen D. Lucas, former DGAEPM and AERE Branch Advisor. The intent was to provide a guiding set of principles or values for the role and future of the AERE occupation. The principle of leadership underpins the two other competencies; moreover, the AERE occupation, at all levels, is one of the few in the Air Force that leads airmen and women on the flight line. The engineering competency makes the AERE occupation truly distinct in the Air Force

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[119] Department of National Defence, A-PD-055-002/PP-001 *AERE MOC 41, Canadian Forces Regular Officer Specification – Aerospace Engineering Occupation* (Ottawa: DND Canada, 01 March 2007), A-6/45.

[120]These values were documented during the September 2006 AERE Council Strategic Planning Session. Obtained from an e-mail from Maj C. Wortman, CFSATE AERE Squadron Commander (Sqn Comd), former Executive Assistant (EA) to BGen Lucas, former DGAEPM and AERE Branch Advisor; dated 7 April 2008.

[121]Aerospace Engineering, "AERE Council Communique 2006," http://dgaepm.ottawa-hull.mil.ca/aere/minutes_e.asp; Intranet; accessed 13 February 2008.

and the CF as a whole. The expectation of the AERE culture is that its officers should understand the aircraft more in-depth than the aircrew, and at least to the same systems level as the technicians they lead. Finally, the principle of operations serves to enable the delivery of air power; that is, AERE officers need an understanding of air operations, and military operations as a whole, to facilitate the requisite support. [122] As a note, the meaning of each of the core competencies that comprise LEO is not formally recorded, and it falls to senior officers, specifically members of the AERE Council, to pass on their interpretations of these values to the AERE population. In contrast, examining sister engineering and support occupations within the CF, including the Electrical Mechanical Engineering (EME), Communications and Electronic (CELE), and Logistics (LOG) branches, all have recorded and made available to their membership the visions, missions, competencies, branch origins, history, and traditions of their respective cultures.[123] The same does not exist for the AERE culture.

The use of the term 'espoused' is deliberate as Schein proposes that these beliefs and values may predict what is said but not necessarily what is done.[124] Some debate exists within the community as to the specific order in which the values appear, as to whether one value has primacy over the other two. The values under debate have been 'leadership' and 'operations', which may indicate that through the development of the

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[122]Based on an e-mail from BGen (ret'd) Lucas received through Maj C. Wortman, CFSATE AERE Sqn Comd, and former EA to BGen Lucas; dated 14 April 2008.

[123]The EME branch has B-GL-314-000/AF-000 *The Electrical and Mechanical Engineering Branch* publication. The CELE branch has a website http://www.commelec.forces.gc.ca/organization/about/index_e.asp. The Logistics branch has a Logistics Handbook available electronically at http://www.forces.gc.ca/admmat/logbranch/handbook/Volume1/Vol1_e.htm.

[124]Schein, *Organizational Culture and Leadership*. 3rd ed., 30.

AERE culture 'engineering' has actually become a basic underlying assumption. It can be argued that the values of 'operations' and 'leadership' are not unique to the AERE culture, as these are implicit in the overarching military and Air Force cultures. Notwithstanding the debate, it is the manifestation of these values within the culture that is important.

The value of leadership is inculcated throughout the early development of the AERE officer, to a degree that is unparalleled in comparison to the other occupations of the Air Ops branch. This aspect will be examined in further detail in Chapter 3 in the analysis of AERE leadership. The values of engineering and operations have shaped recent initiatives within the AERE culture, specifically the Aerospace Engineering Champion Program, and Project EMPENNAGE. The Aerospace Engineering Champion Program was initiated in 2004 to address, in part, concerns within the community regarding the erosion of engineering specialist support due to past personnel reductions and an aging demographic.[125] The goal of the program is to establish a network of engineering specialists or Subject Matter Experts (SME) within the AERE community, more specifically, within the engineering support domain, to provide advice to sponsors and stakeholders regarding the use of engineering specialties, the development of policies and procedures related to those specialties, and the development and succession planning

[125]Director General Aerospace Equipment and Program Management. "Specialist Champion Framework." http://dgaepm.ottawa-hull.mil.ca/champion/Docs/Framework.doc; Intranet; accessed 4 April 2008.

of future specialists.[126] This initiative is based on the culture's value of engineering, and is in keeping with Stedman's vision of an occupation of specialists.

Project EMPENNAGE, on the other hand, marries the triad of values. The initiative was established in 2005 "to revitalize [AERE] training by aligning it to the Air Worthiness Program, and update Aircraft Maintenance Policy, the evolving needs of flight line operations and those of other supporting organizations, principally Director General Aerospace Equipment and Program Management (DGAEPM)."[127] The initiative recognizes the exigencies of the current operations environment, with a focus on expeditionary operations, through the development of "technically competent" AERE officers who can demonstrate independent "technical leadership" in both static and deployed settings.[128] AERE training is predicated on employment in the maintenance operations domain, though it is recognized that not all graduates of the AERE Officer Basic Course (AOBC) will be employed in the field; approximately 27% of 2007 graduates were posted to non-maintenance operations positions.[129]

The project is focused on three tracks including: a formal review and update of the AERE Occupational Specification (OS) to better reflect the current environment and demands placed on the AERE officer; re-engineering AERE training and development to reflect the core competencies by early fleet streaming, to promote a more detailed

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[126]Director General Aerospace Equipment and Program Management, "Aerospace Engineering Champion Program," http://dgaepm.ottawa-hull.mil.ca/champion/index_e.asp; Intranet; accessed 4 April 2008.

[127] Canadian Armed Forces, 1 Canadian Air Division, *Project Charter: EMPENNAGE Version 5,* (Canadian Forces Base Winnipeg: [no file number given]), 2005, 1/23.

[128]Canadian Armed Forces, 1 Canadian Air Division, *Project Charter…,* 1/23-3/23.

[129]Director General Aerospace Equipment and Program Management, "Project EMPENNAGE: Senior Review Board – Power Point Presentation," http://dgaepm.ottawa-hull.mil.ca/champion/index_e.asp; Intranet; accessed 14 February 2008.

knowledge of the aircraft type; and establishing a development program to increase the engineering cognizance, to ensure responsive support both from the maintenance operations and engineering support domains.[130] This project has resulted in subordinate, but complementary initiatives including Ex CAPSTONE, and the Devolution of Engineering Authority Working Group (DEAWG).

Ex CAPSTONE acknowledges that Project EMPENNAGE will create a more technically competent AERE officer, ready for the maintenance operations environment, but proposes that the development of those destined for non-operations employment is just as important, given maintenance operations' dependency and reliance on the responsiveness of those employed in the engineering support domain.[131] The intent is to provide a capstone exercise in a maintenance operations environment to facilitate the consolidation of technical leadership and to inculcate an operations focus. The goal of the DEAWG initiative is to increase the responsiveness to maintenance operations through the formal devolution of Weapon System Management (WSM) and Aircraft Engineering Officer (AEO) authority, typically held at the DGAEPM level, to specific individuals who meet the necessary prerequisites.[132] Both the Ex CAPSTONE and DEAWG initiatives serve to infuse the AERE culture with the 'operations' core competency. The AERE core competencies, leadership, engineering, and operations have

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[130]Canadian Armed Forces, 1 Canadian Air Division, *Project Management Plan: EMPENNAGE Version 5*, (Canadian Forces Base Winnipeg: [no file number given], 2007), 5/16-7/16.

[131]Major M.A Shaw, *The Capstone Exercise – "Duty Engineer" Concept Trial*, (Canadian Forces Base Esquimalt: file 4500-1 (SAMEO), 15 Nov 07), 1/5.

[132]Canadian Armed Forces, 1 Canadian Air Division. *Project Management Plan: EMPENNAGE Version 5*, 15/16.

pervaded the culture and its development as well its leaders; as such, they should be regarded its values, beliefs and assumptions.

AEM/AERE Sub-cultures

It is necessary to briefly discuss the concept of sub-cultures within the AEM culture, as it is recognized by most theorists that groups are not entirely homogeneous. Most evident within the AEM culture are the officer and NCM/NCO sub-groups and the fleet community sub-groups, such as Fighter, Transport, Search and Rescue, Maritime and Tactical Helicopter. However, these sub-groups are also common to the broader Air Force culture, as such, are not unique to the AEM culture. It is the maintenance operations and engineering management sub-groups which are unique and distinct within the AEM community; and more specifically, the AERE culture. Of the total CF AERE population, 17% are employed in maintenance operations, and over 50% are employed in engineering support positions.[133] Notwithstanding the numbers employed in engineering support, it is the greater AERE culture's focus on operations which governs officer development, as discussed in the previous section.

Applying Moskos's Institutional/Occupational (I/O) model to these sub-cultures, it can be argued that due to the proximity of the maintenance operations to the achievement of the operational mission it exhibits greater 'institutional' tendencies than the engineering support sub-culture. In contrast, given its detachment from the direct

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[133]See footnote 112, regarding the author's typification of the AERE culture. Percentages by employment area were: 17% in maintenance operations, 17% in maintenance support staff, 44% in engineering management, and 22% in other staff positions. Approximately half of those identified as maintenance support staff are employed in WSM/AEO positions, and best typified as engineering support. Data available in the Annual AERE Career Manager 2008 PowerPoint Presentation available on Intranet.

achievement of the operational mission, the engineering support sub-culture more readily demonstrates civilian characteristics; thus, it is more closely aligned with the 'occupational' model. This distinction between sub-cultures fits within the 'differentiation' view of Martin's three perspective model. In the differentiation view, within the boundaries of the sub-culture, or intra-sub-culture, consistency and conformity is achieved; however, inter-sub-culture, differences in values and beliefs "often conflict with each other."[134] It is useful to identify the differences in sub-cultures to allow cultural leaders to take an 'integrationist' view, in order to determine the level of consensus, consistency, and conformity; thus, homogeneity, needed to be achieved within the greater culture.[135]

The AERE culture, and its leaders, implicitly acknowledges its heterogeneity, and the existence of sub-cultures, through initiatives such as Project EMPENNAGE. From a cultural perspective, the goal of these initiatives is to create an integrated and more homogeneous AERE community with an equal focus on its core values, beliefs, and assumptions.

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[134]Joanne Martin, *Cultures in Organizations: Three Perspectives*, (New York: Oxford University Press, 1992), 12.

[135]Winslow, "Canadian Society and Its Army," *Canadian Military Journal*, 11.

CHAPTER 4: LEADERSHIP – THE OTHER SIDE OF THE COIN

Schein posits an evolutionary perspective of a culture in which leadership plays a key role. As previously discussed, in the preliminary stages of a cultural evolution leaders beliefs, values and assumptions are adopted by the group. This lays the foundation for the culture for the type of leadership that is acceptable, that is to say "[t]he culture now defines leadership."[136] As the culture evolves, it is the task of leaders to identify the requirement for changes to the culture, as such, leadership defines the culture. In essence, leaders develop a distinct culture and a culture develops distinct leaders. In the case of the AERE culture, it originated with its effective founder, Air Vice-Marshal Stedman, and has evolved over time under the leadership of numerous senior AERE officers, to adapt to the changing broader cultures and environment, most recently CF transformation. The focus of the next two chapters is to provide an overview of the concept of leadership, the closely related concepts of management and command, and the various theories available. Additionally, the AERE culture will be examined in the context of leadership development, and whether one particular leadership approach best describes the AERE culture and its constituent sub-cultures.

Leadership Defined

"Leadership is one of the most observed and least understood phenomena on earth."[137] Though leadership has been the subject of great study in comparison to the concept of culture, there is no one definition for the term. The CF defines leadership as

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[136]Schein, *Organizational Culture and Leadership*. 3rd ed., 2.

[137]James MacGregor Burns, *Leadership,* (New York: Harper and Row, 1978), 2.

"directly or indirectly influencing others, by means of formal authority or personal attributes, to act in accordance with one's intent or a shared purpose."[138] Leadership expert, Peter G. Northouse, defines leadership as "a process whereby an individual influences a group of individuals to achieve a common goal."[139] Northouse promotes the concept that leadership is a "process" whereby the leaders and followers interact symbiotically. [140] Despite the variations in the definitions of leadership, it is commonly accepted that are all based on the principles of influence, groups, and goals.[141] Influence is essential to the leadership process, and the follower is key to the concept of influence. Just as culture and leadership are two sides of the same coin, so are leaders and followers.[142] The leader/follower relationship is important in the study of various leadership theories and approaches.

Leadership, Management, and Command

The related but distinct terms leadership, management, and command and their variations are typically and mistakenly used interchangeably in the military environment. As such, it is necessary to examine these concepts in relation to one another. The term leadership is often used to refer to a group of individuals who occupy positions of

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[138]Department of National Defence, A-PA-005-000/AP-003 *Leadership in the Canadian Forces: Doctrine* (Kingston: The Canadian Defence Academy, 2005), 3.

[139]Peter G. Northouse, *Leadership: Theory and Practice*, 4th ed. (Thousand Oaks, CA: Sage Publications, 2007), 3.

[140]Northouse, *Leadership: Theory and Practice*, 4th ed., 3.

[141]*Ibid*., 3.

[142]J.C. Rost, *Leadership for the Twenty-First Century*_(New York: Praeger, 1991), quoted in Peter G. Northouse, *Leadership: Theory and Practice*, 4th ed. (Thousand Oaks, CA: Sage Publications, 2007), 4.

authority in an organization, i.e. the phrase 'leadership of the CF' refers to senior flag officers such as the Chief of Defence Staff (CDS) and Vice Chief of Defence Staff (VCDS). People in an organization tend to refer to individuals who occupy hierarchically senior positions as leaders even if they do not demonstrate leadership, in the sense that Northouse suggests as a process of influencing others.[143]

Most organizational behaviour theorists agree that leadership differs from management. Kotter posits that "leadership and management are two distinctive and complementary systems of action."[144] Bennis and Nanus coined the phrase that has now become commonplace: "Managers are people who do things right and leaders are people who do the right thing."[145] The distinction being that leadership is predicated on effectiveness or "activities of vision and judgement" and management is predicated on efficiency or "activities of mastering routines." [146]

This view is harmonious with that of Kotter who maintains that "[m]anagement is about coping with complexity...[and] leadership, by contrast is about coping with change." [147] Management is the process of establishing order and structure in an organization through the manipulation of resources, and leadership is the process of

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[143]Lt Col Peter Bradley, "Distinguishing the Concepts of Command, Leadership, and Management," in *Generalship and the Art of the Admiral: Perspectives of Canadian Senior Military Leadership*. ed. Bernd Horn and Stephen J. Harris, 105-120 (St. Catharines, ON: Vanwell Publishing Limited, 2001), 114.

[144]John P. Kotter, "What Leaders Really Do," *Harvard Business Review* 68, no. 3 (May-June 1990): 103-111; http://content.ebscohost.com; Internet; accessed 26 February 2008, 103.

[145]Warren Bennis and Burt Nanus, *Leaders: The Strategies for Taking Charge,* (New York: Harper and Row, 1985), 21.

[146]Bennis and Nanus, *Leaders: The Strategies for Taking Charge*, 21.

[147]Kotter, "What Leaders Really Do," 104.

achieving a vision or goal through motivation and inspiration.[148] In the military with the focus on the 'combat-warrior' image, applying Harries-Jenkins centre periphery model, the concept of management is typically and incorrectly applied to those who occupy the peripheries, in which the AERE culture is situated, and leadership to those who occupy the nucleus. In doing so, this accords an unwarranted sense of elitism to the concept of leadership. This is evidenced by the wealth of leadership research available for the Army, particularly combat arms, and the dearth of leadership research available for the Air Force, as well as support occupations.[149]

The concept of command is central and unique to the military organization. Pigeau and McCann define command as "the uniquely human activity of creatively expressing will, but one that can be expressed only through the structures and processes of control."[150] A central dimension of the Pigeau-McCann concept of command is authority, which is comprised of two components: legal and personal authority. Legal authority is formally granted and accords the "power to act" and related to management.[151] Personal authority is informally given by subordinates and peers based on trust, reputation, and experience, and is inherent in leadership. "Legal authority is power for manipulating resources while personal authority is power to influence

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[148]*Ibid*.,104.

[149]English, and Westrop, *Canadian Air Force: Leadership and Command*…, 1.

[150]Ross Pigeau and Carol McCann, "What is a Commander?" in *Generalship and the Art of the Admiral: Perspectives of Canadian Senior Military Leadership*. ed. Bernd Horn and Stephen J. Harris, 79-104 (St. Catharines, ON: Vanwell Publishing Limited, 2001), 101.

[151]Pigeau and McCann, "What is a Commander?", 85.

motivation."[152] The concepts of legal and personal authority link management and leadership as part of the concept of command. As such management and leadership both enable command. Bradley echoes the Pigeau-McCann conception of command with the "parsimonious view of command" as depicted in Figure 4.1.[153] This view depicts the action of command as a combination of leadership and management behaviours, where the ratio of one behaviour to the other is dependent on the characteristics of the individual carrying out the action, and the situation in which command is exerted.[154] CF leadership doctrine further clarifies that the concept of management which is identified as a component of command is the "resource-management" function, and not to be confused with the management function exercised in civilian organizations which parallels that of command.[155] In the analysis of the AERE culture these terms will be used; however, the focus will be on the concept of leadership.

[152]Pigeau and McCann, "What is a Commander?", 93.

[153]Bradley, "Distinguishing the Concepts of Command, Leadership, and Management," 106-107.

[154]*Ibid*., 106-107.

[155]Department of National Defence. A-PA-005-000/AP-004 *Leadership in the Canadian Forces: Conceptual Foundations*, 9.

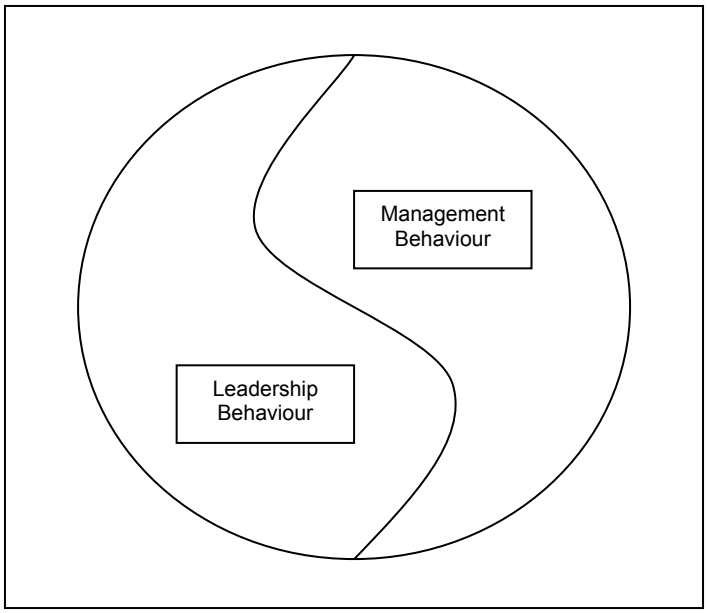

Figure 4.1 – Bradley's Parsimonious Concept of Command

Source: Bradley, *Distinguishing the Concepts of Command, Leadership and Management,* 107.

Leadership Theories and Models

The majority of leadership theories and models are centred on the leader, the follower, the situation, or a combination thereof.[156] This overview will address the most common leadership theories including the trait approach, the style or behavioural approach, the situational or contingency approach, and new or emerging approaches.

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[156]Emily Spencer, *Leadership Models and Theories: A Brief Overview*, [Kingston, ON: Canadian Forces Leadership Institute] Report on-line; available from http://www.cda-acd.forces.gc.ca/cfli/engraph/research/pdf/12.pdf; Internet; accessed 15 November 2007, 1.

The Trait Approach

Trait or "great man" theories were prevalent in the first half of the 20th century, but are enjoying resurgence with emerging leadership theories.[157] This approach conjures up images of 'great' historical military, political, and business leaders. Trait theories primarily centre on the study of the leader themselves to determine the personality traits or characteristics that make effective or 'ideal' leaders, and operate under the premise that "[i]f the leader is endowed with superior qualities that differentiate him from his followers, it should be possible to identify these qualities."[158] Researchers believed that a leader profile could be determined to select the right person for the job as a leader. Trait theories also promote the old adage that 'leaders are born, not made.'[159]

Over the course of time, researchers developed numerous and varied lists of the elusive traits that defined the 'ideal' leader. Despite a lack of agreement between the lists of characteristics, Northouse suggests there is a convergence which he articulates as five key traits that leaders should possess including: intelligence, self-confidence, determination, integrity, and sociability.[160]

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[157]Northouse, *Leadership: Theory and Practice*, 4th ed ., 15.

[158]Bernard M. Bass, *Bass and Stogdill's Handbook of Leadership*, 3rd ed. (New York: The Free Press, 1990), 39.

[159]Deanne N. Den Hartog and Paul L. Koopman, "Leadership in Organizations." Chap. 9 in *Handbook of Industrial, Work and Organizational Psychology*, *Vol 2*. (London: Sage Publications, 2002), 167-168,

[160]Northouse, *Leadership: Theory and Practice*, 4th ed ., 19.

Though "intuitively appealing,"[161] trait theories were criticized for a lack of empirical evidence, the subjectivity of determining the leader profiles, the lack of consideration of other variables such as followers and the situation, and the inability to teach or apply characteristics that are perceived as inherent. This led discouraged researchers to focus on other aspects of leadership.

The Style or Behavioural Approach

The focus of the style or behavioural approach is what leaders do rather than what they are.[162] It is centred on studied patterns of behaviour which can be learned, in contrast to the 'traits' that cannot. The study of the behavioural approach was based on three influential studies: the Ohio State studies, the University of Michigan studies, and studies by the researchers Blake and Mouton. The results of these studies can essentially be synthesized into two dimensions of behaviour: task and relationship. Task behaviours focus on the technical aspects such as establishing structure and organization that enable goal attainment, while the relationship aspect focuses on behaviours that facilitate the emotional and social needs of subordinates to make them feel comfortable and influence their ability to achieve the goal.[163] The crucial point about the style approach is "how leaders combine the two kinds of behaviours to influence subordinates in their efforts to reach a goal."[164]

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[161] Northouse, *Leadership: Theory and Practice*, 4th ed., 24.

[162]Den Hartog and Koopman, "Leadership in Organizations," 168.

[163]Lt Col Nancy E. Weaver, *Developing Aerospace Leaders for the Twenty-First Century* (Santa Monica: Rand Corporation, 2001) 7.

[164]Northouse, *Leadership: Theory and Practice*, 4th ed ., 69.

There are several criticisms regarding the behavioural approach. There is no conclusive evidence which attributes outcomes to specific leader behaviours or styles, that is to say, the application of a particular style would not necessarily result in goal attainment. The second criticism is related to the first, in that the behavioural approach addresses the leader and follower but excludes the situation as a variable.[165]

The Situational or Contingency Approach

The situational or contingency approach addresses the variable that the previously mentioned approaches do not – the situation, and in doing so demonstrates an evolution from the one and two dimensional trait and behavioural approaches. Most sources use the terms situational and contingency synonymously; however, Northouse makes a subtle distinction between the two approaches. He submits that in the situational approach the leader must adapt their style to the demands of the situation, whereas the contingency approach focuses on matching the leader to the situation for effective results.[166] As the difference is nuanced, for the purposes of this paper, both approaches will be addressed together.

Hersey and Blanchard's Situational Leadership. This approach was popularized by Hersey and Blanchard's Situational Leadership (SLT) model which was common in leadership training programs in business and military institutions including the CF. Hersey and Blanchard posit that since SLT focuses on relatively tangible variables such as behaviour and the environment that it "allows for the possibility that individuals can be

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[165]Den Hartog and Koopman, "Leadership in Organizations," 169

[166]Northouse, *Leadership: Theory and Practice*, 4th ed ., 91 and 113.

trained to adapt their style of leader behaviour to varying situations."[167] This model is based on the relationship between the dimensions of task behaviour and relationship behaviour, and what is an effective leadership style in a particular situation. Task behaviour focuses on goal achievement through one-way communication from the leader to the follower which provides them information in "what to do, how to do it, when to do it, where to do it, and who is to do it."[168] In contrast, relationship behaviour is characterized by leader communication with one or more followers which is largely "listening, facilitating, and supportive in nature."[169] The two dimensional plotting of the task and relationship behaviours result in four styles: delegating (low task, low relationship), participating (low task, high relationship), selling (high task, high relationship), and telling (high task, low relationship). [170] This model stresses the leader-follower dyadic by including follower readiness or maturity. Readiness is not dependent on follower characteristics, but on how ready they to carry out a specific task based on the situation.[171] Essentially under this model, the leader must choose the style which is most appropriate to the situation and the readiness of the follower.

Path-Goal Theory. This theory focuses on the motivational needs of the follower, rather than the situational theory, which focuses on the readiness or maturity of the follower. It is uniquely based on expectancy theory which posits that the motivation for

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[167]Paul Hersey, Kenneth H. Blanchard, and Dewey E. Johnson. *Management of Organizational Behaviour: Utilizing Human Resources,* 7th ed. (Upper Saddle River, NJ: Prenctice Hall, 1996), 120.

[168]Hersey, Blanchard, and Johnson, *Management of Organizational Behaviour*…, 191.

[169]*Ibid*., 191.

[170]*Ibid*., 200.

[171]*Ibid*., 193-4.

followers to engage in certain behaviours is a combination of "(1) his expectations that the behaviour will result in a specific outcome; and (2) the … personal utilities or satisfactions, that he derives from the outcome."[172] Under the path-goal theory, effective leadership is based on the leader's ability to motivate followers by removing obstacles to enable them to accomplish a goal. The leader must balance two behaviours: initiating structure, which is similar in concept to the previously mentioned task behaviour, and consideration behaviour which is similar to relationship behaviour.[173] Ultimately, under this theory the leader "defines the goal", "clarifies the path", "removes obstacles", and "provides support" for the follower through the selection of the appropriate leadership style that best suits the motivational needs of the follower given the particular situation.[174] Of the previously discussed theories, the path-goal theory most closely approaches one that military leaders can associate with due to its emphasis on the motivation of followers. The military leader has to be able to identify the obstacles in their subordinates' paths, whether that is lack of confidence to carry out a task, or the fear in taking an objective, and in turn has to remove those obstacles.

New or Emerging Approaches

Transformational Leadership. New or emerging approaches, though two to three decades old, are one of the most popular l

transformational leadership approach which was first introduced in 1978 by James MacGregor Burns in his seminal work titled *Leadership*. Warren Bennis, Burt Nanus, and Bernard M. Bass furthered this theory in their research and writings.

Northouse ascribes the popularity of the transformational leadership to it "fit[ting] the needs of today's work groups, who want to be inspired and empowered to succeed in times of uncertainty."[175] The transformational approach builds upon the behavioural and situational/contingency theories, which are largely transactional in nature where "leaders approach followers with an eye to exchanging one thing for another" as in a cost-benefit manner.[176] Bennis and Nanus liken transactional leadership to management where it consists of "…a set of contractual exchanges, "you do this job for that reward"…"[177] Transformational leadership, on the other hand, "occurs when one or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality."[178] This approach clearly distinguishes itself with the focus on the moralistic aspect of the leader-follower dyad.

Transformational leadership shapes the environment in which the leader and the follower exist which leads to "empowerment" [179] of the follower motivating them exceed

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[175]Northouse, *Leadership: Theory and Practice*, 4th ed ., 175.

[176]Burns, *Leadership,* 4.

[177]Bennis and Nanus, *Leaders: The Strategies for Taking Charge*, 218.

[178]Burns, *Leadership,* 20.

[179]Bennis and Nanus, *Leaders: The Strategies for Taking Charge*, 218

what they thought possible.[180] This type of leadership emphasizes the leader-follower relationship and the leader's obligations to the follower. Thus, this type of leadership is in keeping with *Officership 2020*'s vision of officers "[l]eading by example, fully accountable, [who] are dedicated to their subordinates and inspire loyalty and mutual trust."[181] This type of leadership is values-based in nature, and influences follower commitment, loyalty, and performance. Transformational leadership's basis in values and morals makes the theory conducive to application in a military institution like the CF with an inculcated values-based ethos.

Full Range of Leadership (FRL).[182] Bass terms the codification of the "new paradigm of leadership", that is, that leadership can be transactional or transformational, as the Full Range of Leadership (FRL).[183] He posits that the paradigm that has been implicitly recognized within the military through the need for adaptive and flexible leaders who are able to adjust to the rapidly changing environment.[184] Bass also argues that "the best leaders are both transformational and transactional."[185] FRL is a continuum of leadership which is depicted in Figure 4.2, comprised of transactional and transformational leadership components. Transformational leadership is comprised of Charismatic Leadership (CL) or Idealized Influence (II), Inspirational Motivation (IM),

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[180]Bernard M. Bass, *Transformational Leadership: Industrial, Military, and Educational Impact*, (Mahwah, NJ: Lawrence Erlbaum Associates, 1998), 4.

[181]Department of National Defence, *Canadian Officership in the 21st Century (Officership 2020)* (Ottawa: DND Canada, 2001), 5.

[182]Bass, *Transformational Leadership…*, 2.

[183]*Ibid*., 2-3.

[184]Bernard M Bass et al., "Predicting Unit Performance by Assessing Transformational and Transactional Leadership," *Journal of Applied Psychology* 88, no. 2 (2003): 207.

[185]Bass, *Transformational Leadership…*, 167.

Intellectual Stimulation (IS), and Individualized Consideration (IC), or the 4I's.[186] Charisma or idealized influence (II) describes a leader who instils followers with a mission and a sense of purpose and collective identity. They are regarded as role models that follows strive to emulate. In that sense, there is typically something unique and special about these leaders. The concept of charismatic leaders has resulted in a renewed interest in the previously mentioned trait theory to determine what characteristics distinguish leaders who exhibit charismatic traits or behaviour distinct. Inspirational motivation (IM) is based on a leader motivating and inspiring followers through the articulation of high expectations. This type of leadership instils team spirit and follower commitment to a common shared vision.[187] Through intellectual stimulation (IS) a leader promotes innovation, creativity, and critical thinking amongst followers. Followers are encouraged to participate in problem solving, to challenge ways of doing business, and provide new imaginative approaches and solutions in an uncritical environment. Individualized consideration (IC) component represents coaching and mentoring behaviours where the leader pays attention to the developmental and achievement needs of individual followers. This leadership is characterized by one-on-one communication, and ultimately, the leader plays a key role in the follower's actualization process.[188]

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[186]Northouse, *Leadership: Theory and Practice*, 4th ed ., 181.

[187]Bass, *Transformational Leadership…*, 5.

[188]Northouse, *Leadership: Theory and Practice*, 4th ed ., 183.

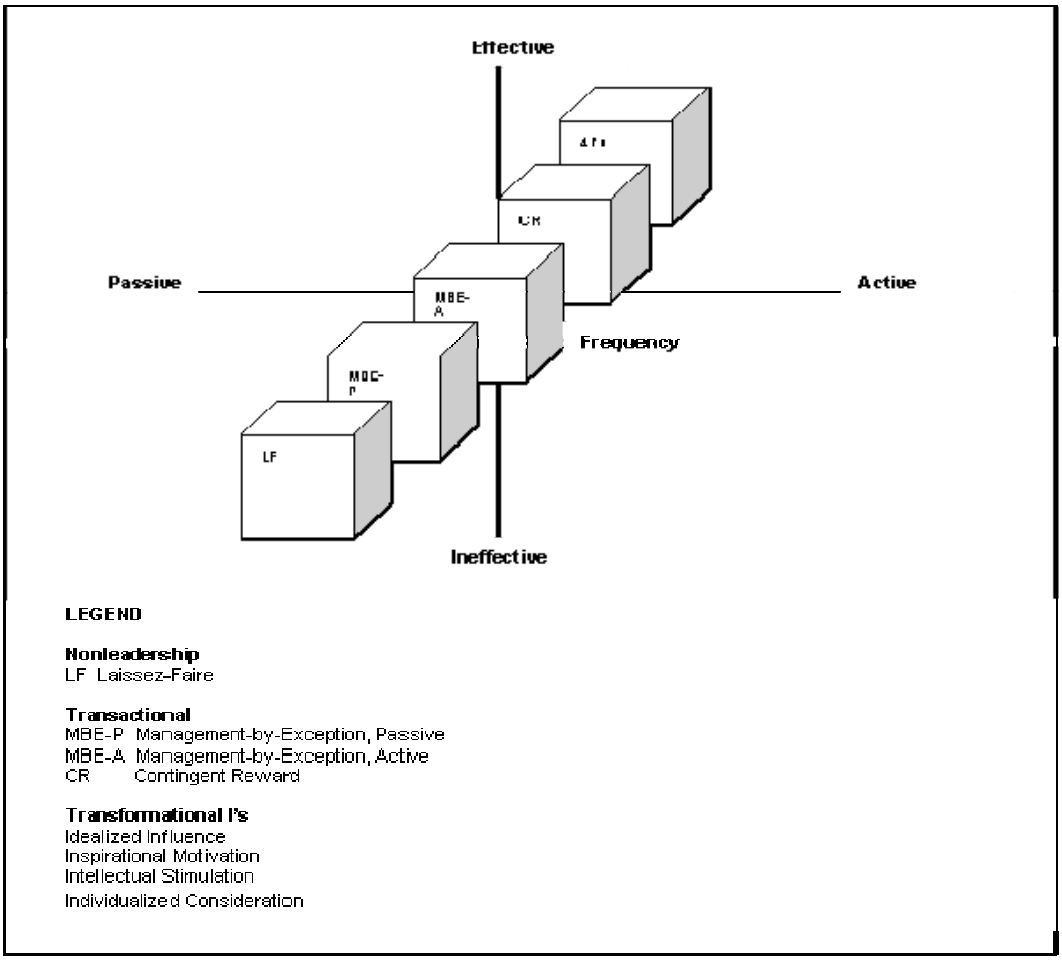

Figure 4.2 – Full Range of Leadership Model

Source: Northouse, *Leadership: Theory and Practice*, 182.

Transactional leadership is comprised of Contingent Reward (CR), Management-by-Exception (MBE), and Laissez-Faire Leadership (LE). Contingent reward is an exchange between followers and leaders in which followers carry out a task for a negotiated reward. This type of leadership is effective; however, unlike transformational leadership, it does not elevate followers beyond self-interest. Management-by-exception (MBE) is less effective than contingent reward leadership, and is characterized by leader observation for deviations from agreed upon follower behaviour and follow-up corrective

action. It is classified as active (MBE-A) or passive (MBE-P).[189] In the active form, the leader closely observes the follower and takes necessary corrective action when a deviation is observed. While in the passive form the leader only intervenes when mistakes have been made and then takes corrective action. Laissez-faire leadership is considered "the absence of leadership"[190] by Bass or "non-leadership"[191] by Northouse. In short, laissez-faire leadership is non-transactional and the abrogation of leadership behaviour.

Transactional leadership provides the necessary structure to the follower-leaders dyad which enables effective transformational leadership. Transformational leadership "adds to structure and readiness by helping the followers to transcend their own immediate self-interests and by increasing their awareness of the larger issues."[192] Effective leaders must be able to exhibit both transactional and transformational behaviours.

The CF Leadership Model. *Officership 2020* mandated that the CF would "[i]ntegrate appropriate emerging leadership theories into military doctrine" to achieve the strategic objective of the "application of sound leadership" within the officer corps.[193] As a result, the CF leadership model was introduced in 2005 which is based on the principles of transformational leadership. CF leadership doctrine within the context of

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[189]Bass, *Transformational Leadership…*, 7.

[190]Bass, *Transformational Leadership…*, 7.

[191]Northouse, *Leadership: Theory and Practice*, 4th ed., 187.

[192]Bass, *Transformational Leadership…*, 41.

[193]Department of National Defence, *Officership 2020,* 10.

the CF, defines transformational leadership as "…rooted in the values systems of the Canadian military ethos and may refer either to the transformation of people or to organizational transformation."[194] The CF focus on people and organization is reflected in the two major functions of the model: leading people and leading the institution.

The model ascribes to stratified system theory, which suggests that the functions of a leader change through the organizational hierarchy as their locus of control and situational ambiguity increases.[195] As such, the model promotes that at the lower levels, or tactical and operational levels, that leaders largely employ leading people functions, and at the senior or strategic levels, leaders primarily employ leading the institution functions.[196] The model further defines five dimensions for effective leadership, and prescribes responsibilities for each dimension. Both the leading people and leading the institution functions include a combination of transactional and transformational leadership behaviours.

This blend of transactional and transformational behaviours within the CF major leadership functions make it difficult to apply in the analysis of a community or culture; it is better suited to the examination of an individual leader. Additionally, no empirical evidence yet exists regarding the effectiveness of the model. As such, the Full Range of Leadership model is better suited for attempting to characterize leadership behaviour in the AERE culture.

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[194]Department of National Defence, *Conceptual Foundations*, 70.

[195]*Ibid*., 4.

[196]*Ibid*., 12.

Bass promotes Schein's theory regarding the relationship between leadership and culture by stating that "[a]n organizational culture affects its leadership as much as its leadership affects the culture."[197] Bass suggests that successful cultures need to be adaptive, therefore more transformational. As a result of research regarding successful and unsuccessful businesses, Kotter and Heskett concluded that unsuccessful businesses had failed to be adaptive and their leaders "became solely managers or…mainly transactional."[198] This suggests that all cultures need a degree of transformational tendencies to be successful.

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[197]Bass, *Transformational Leadership…*, 62.

[198]*Ibid*., 64.

CHAPTER 5: LEADERSHIP IN THE AERE CULTURE – AN ANALYSIS

This chapter will examine the concept of leadership in relation to the AERE culture. It will first describe the emphasis placed on leadership development in the AERE culture, which will be contrasted against leadership development of Air Force officers who are at the centre of Harries-Jenkins centre periphery model, primarily pilots. Secondly, this examination will be followed by a discussion of the issues concerning and differences in leadership and command potential for the AERE and pilot cultures. Then three relevant USAF studies will be discussed to familiarize the reader with research findings which attempt to typify operator and non-operator leadership styles and behaviour. This will be followed by an analysis of the AERE culture against the pilot culture using situational contingencies to identify whether transformational or transactional leadership best characterizes the AERE culture as a whole. Finally, the two AERE sub-cultures, maintenance operations and engineering support, will be examined in terms of situational contingencies to determine the likelihood of transactional and transformational leadership.

Leadership Development

As discussed in Chapter 3, there is a significant emphasis placed on the concept of leadership in the AERE culture. It is obvious in an analysis of occupation Officer Specifications (OS). The AERE OS states that "AERE officers embody the skills and knowledge required to *lead* and *command* personnel…," and it further emphasizes that "AERE officers must also, on a *continuing basis*, improve their knowledge and skill in

leadership, *management*, engineering, maintenance and the profession of arms."[199] The AERE OS further outlines specific skill areas, including 'command and lead' skills, which identifies the requirement to be familiar with "the principles…and techniques of leadership,"[200] and management functions including administration, finances, and materiel. In contrast, the pilot OS does not explicitly state the requirement to learn and foster leadership, management, or command skills throughout the developmental phases (DP). The only mention of the term command is to describe the types of positions in which a pilot can be employed, i.e. in command of flight, squadron, or base.[201]

AERE training is oriented on the culture's preferred career development path which sees the AERE officer posted to a maintenance operations position upon graduation from the AERE Officer Basic Course (AOBC), rather than directly to an engineering support position. The assumption is made that all AERE officers will be leading groups of NCMs early in their careers, and AERE development is predicated on this assumption. Throughout their training, AERE officers are prepared to assume leadership roles. AERE Practical Training (APT) is given to candidates in preparation for AOBC, the occupation qualifying course. APT is administered over two summers, in the case of Regular Officer Training Plan (ROTP) candidates, with the primary goal of exposing candidates to the technical and maintenance environment. It is structured in

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[199]Department of National Defence, A-PD-055-002/PP-001 *AERE MOC 41, Canadian Forces Regular Officer Specification – Aerospace Engineering Occupation* (Ottawa: DND Canada, 01 March 2007), A-3/45 (emphasis added).

[200]Department of National Defence, A-PD-055-002/PP-001 *AERE MOC 41…,* A-27/45.

[201]Department of National Defence, A-PD-055-002/PP-001 *Code 32 Abvn PLT, Canadian Forces Regular Officer Specification – Pilot Classification, Ch. 7 1981-10-30* (Ottawa: DND Canada, November 2007), 1-2-32 and 1-2-33.

such a way that over the two periods candidates progressively gain an appreciation of the responsibilities of the junior NCM to the junior AERE officer by working alongside them. APT 2 is focused with working at the technician level, and APT 3 at the supervisor level, both of which are allocated 50 training days.[202] In addition, candidates are assessed on their professional qualities including leadership. The factors to be assessed include building morale or esprit de corps, motivating others and gaining their cooperation and respect, and having a vision; behaviour which is transformational in nature. APT is unique in that it allows AERE officers early on in their careers to identify with those they will be leading in the future.

Additionally, the AOBC training plan (TP), specifically Part 2 of the course, places a strong emphasis on the concepts of leadership and management. Of the four performance objectives (PO) covered, two are related to management and leadership: PO 409, Use Basic Management Tools in Aircraft Maintenance and PO 412, Lead Aircraft Maintenance Personnel. PO 412 accounts for approximately 49% (5565 minutes) of the total time of Part 2 of the course.[203] Though PO 412 incorporates exposure to skills that would be classified as management, using the definitions presented in Chapter 4, there is an emphasis on the fundamentals of leadership as part of Enabling Objective (EO) 412.03. EO 412.03 includes exposure to the concept of value-oriented leadership,

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[202]Canadian Forces School of Aerospace and Technology and Engineering. "AERE Practical Training Directive." http://16wingweb.borden.mil.ca/CFSATE/CFSATE%20Website/English/AERE/APT/APT%20Directive.htm; Intranet; accessed 18 February 2008.

[203]Canadian Forces School of Aerospace and Technology and Engineering. "AERE Officer Basic Course Phase 2 Training Plan." http://16wingweb.borden.mil.ca/CFSATE/CFSATE%20Website/English/Standards%20Sqn/AERE%20Stds/AOBC%20phase%202/AOBC%20Phase%202.htm; Intranet; accessed 18 February 2008.

characteristics of subordinates, the definition of leadership, different leadership styles, and the concepts of motivation, morale, and esprit de corps. The inclusion of leadership training throughout the early development of the junior AERE officer serves to inculcate the AERE culture with the importance of concept of leadership.

Following the preferred career path after AOBC, an AERE is expected to lead a group of NCMs in a maintenance operations environment at an Air Maintenance Squadron (AMS) or operational flying squadron, primarily in the case of the Tactical Helicopter community. To a large degree, during their first tour, junior officers are mentored by senior Non-Commissioned Officers (NCOs) which further serves to inculcate these officers with the importance of fostering a relationship with their subordinates or followers. Ultimately, the junior officer is essentially given command of the group of NCMs, and in doing so demonstrates varying degrees of both leadership and management behaviours, as in Bradley's parsimonious model mentioned in Chapter 4. AERE leadership development mirrors that which is thought of as the 'traditional army model', where junior officers are given responsibility to lead a group of NCMs early on in their careers, from which point onward they will lead increasingly larger groups of subordinates.

The development of pilots, on the other hand, primarily focuses on their technical skills. English argues that in order for pilots to be accepted as leaders they first need to demonstrate acceptable flying skills which he characterizes as technical leadership. He defines technical leadership as "…the ability to influence others to achieve a goal based on the specialized knowledge or skill of the leader," and further adds that "…it is exercised by leaders who must be able to…actually do the same job as their subordinates

(e.g. pilots)…"[204] Mau and Wooley further support this argument with the statement: "military personnel such as pilots…may see their professional esteem or leadership talents tied to some degree to their natural talents, technical proficiency and eye-hand co-ordination necessary to the performance of their duties."[205]

Pilots are first exposed to traditional leadership training through the Air Force Officer Development (AFOD) Program during their first tour as Lieutenants or Captains. Additionally, pilots do not typically lead subordinates until they reach the rank of Major at which point they are responsible for a flight, composed mostly of officers, within a squadron. Furthermore, pilots' interactions with and familiarity with the responsibilities of NCMs are relatively limited during their career development until they actually command a squadron as a Lieutenant Colonel.

Leadership and Command

Despite the lack of formal leadership training and development until later in their career, pilots are more likely than AERE officers to assume increasingly greater command positions and responsibilities i.e. commanding a base or formation. This difference in command and leadership potential as compared to career progression between the two occupations is depicted in Figure 5.1. It is necessary to examine why

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[204]Allan English, *The Masks of Command: Leadership Differences in the Canadian Army, Navy and Air Force* (Kingston: Canadian Forces Leadership Institute, 2002), 4.

[205]Tim Mau and Alexander Wooley, "Professionalism and Leadership Development," *University of Guelph CLS Leadership Review* 1, no 2, (Fall 2006): 110; http://www.csl.uoguelph.ca/pdf/CSLLeadershipReviewFall2006MauandWooley.pdf; Internet; accessed 18 March 2008.

this is so given the AERE officers' clear advantage over the pilot officer in leadership development.

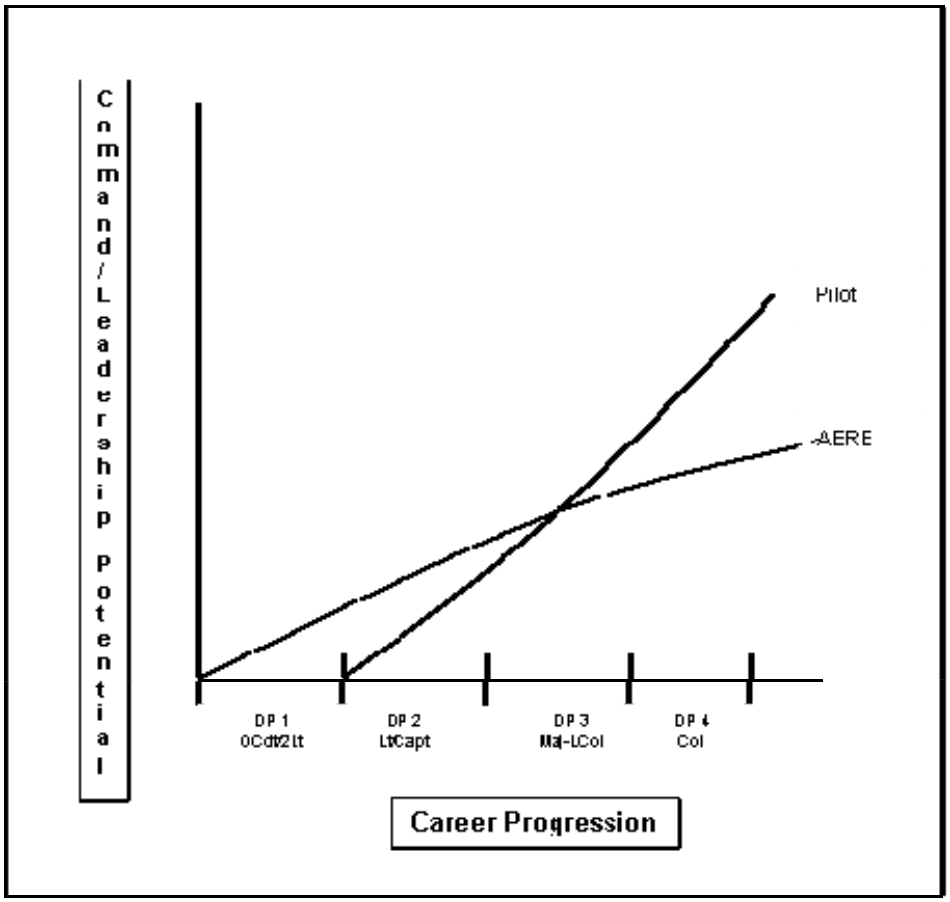

Figure 5.1 – AERE vs. Pilot Leadership Development and Command Potential

Source: Maj. R.A. Evans' own depiction.

Traditionally, opportunities for command within the Air Force, especially senior command appointments for the rank of Colonel and above, are afforded to the aircrew officers, typically pilots. The reason for this rests with Harries-Jenkins' combat-warrior paradigm and the centre-periphery model discussed in Chapters 2 and 3. The potential to assume senior command appointments decreases with occupations found toward the

periphery of the model (refer to Figure 3.1). Therefore, it can be said that an appointment to command, or more specifically the granting of what Pigeau-McCann term legal authority or the 'power to act', is not directly related to previous leadership development or personal authority which is informally given by subordinates and peers based on trust, reputation, and experience.

English argues that in order for an officer to assume an operational command two preconditions must be met: mastery of the profession of arms, not just a technical specialty, and earning trust of subordinates "by sharing in the risks of those they command."[206] He terms the concept of sharing of risk "heroic leadership" which he defines as the "conspicuous sharing of risk with subordinates."[207] English submits that the first precondition is achievable for non-aircrew, based on examples of AERE officers such as MGen Gartenberg as the Assistant to the Chief of the Air Staff (ACAS) and then LCol Abbott as the 1 Wing Chief of Staff (COS), but he ultimately questions whether the second factor, namely gaining the trust of their subordinates, is achievable for non-aircrew.[208]

English makes an implicit assumption in his hypothesis and conception of heroic leadership that the subordinates with whom the individual in command of an Air Force unit or formation will share risk will be fellow aircrew, not non-aircrew officers and

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[206]Allan English, "Leadership and Command in the Air Force: Can Non-Aircrew Command Flying Squadrons?" In 6th Annual Air Force Historical Conference Proceedings, ed. Office of Air Force Heritage and History, (Winnipeg, MB: Air Force History and Heritage, 2000), 85.

[207]English, *The Masks of Command*, 3.

[208]English, "Leadership and Command in the Air Force: Can Non-Aircrew Command Flying Squadrons?" 85-86.

NCMs/NCOs. This logic aligns with that of Samuel Huntington's conception of the *Profession of Arms* which implies that non-aircrew are distanced from the direct management of violence and therefore do not share the same risk. Thus, the AERE culture is caught in a quandary. It is better prepared to lead, in the theoretical sense, than the pilot culture due to its focus on leadership development, but it is limited by the traditional combat-warrior paradigm which governs senior command appointments. In the AERE culture the maintenance operations sub-culture shares a greater proximity to the management of violence than the engineering support sub-culture. As the Air Force becomes more expeditionary with the deployment of tactical aviation and strategic airlift AERE officers employed in this sub-culture will increasingly share risk with their subordinates.

Air Force Leadership Studies

There is a paucity of empirical research regarding leadership in the Canadian Air Force (CAF) which characterizes its leadership and that of its sub-cultures.[209] The overwhelming majority of research that is available is centred on the United States Air Force (USAF). Nonetheless, though it is acknowledged that there are inherent cultural differences between the CAF and USAF, useful parallels can be drawn from the studies regarding aircrew leadership and support leadership; thus, sub-cultural leadership differences.

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[209] In 1994, Maillet compiled an empirical study titled "Military Leadership Profile of the Canadian Air Force" which does not include a qualitative analysis. From the data available in the report the author of this paper was unable to make any useful conclusions.

In terms of leadership development of USAF junior aircraft maintenance officers, Morabito used the Yukl's Managerial Behaviour Study (MBS) research instrument based on the behavioural leadership approach, to determine the activities that most influence leadership development. He found that the most important activities in developing personal leadership skills were working on the job with junior NCMs, senior NCOs, peers, and superior officers. The activities that were found to be the least important in leadership development of junior maintenance officers were formal leadership courses.[210] Though these results are 23 years old they validate the effectiveness of junior AERE leadership development methods currently employed in the CF today, specifically APT. As such, consideration should be given to the development and execution of Project EMPENNAGE within the AERE community, so as not to increase technical leadership at the cost of on-the-job exposure to potential followers. Also, a conclusion can be indirectly drawn that pilots could benefit from a development program which increases interaction with NCMs and NCOs. This conclusion is supported by a comment from a survey respondent: "It seems to me that leadership development is a hands on learning phenomenon, not an academic one. I have learned more about leadership in my 16 months in maintenance than in the previous 9 years as a flyer."[211]

Phelan conducted a study of USAF Majors, with a specific focus on operator and support officers, to determine what behaviours were perceived to be critical to job accomplishment and successful leadership. The major conclusions of the research were

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[210]Michael A. Morabito, "Analysis of Air Force Junior Aircraft Maintenance Officer Leadership Development," (thesis, Air University Air Force Institute of Technology, 1985), 59-60.

[211]Morabito, "Analysis of Air Force Junior Aircraft Maintenance Officer Leadership Development," 101.

that support officers attributed greater importance to interpersonal skills which are associated with Yukl's Taxonomy of Leadership Behaviours: Influencing People and Building Relationships, including informing, problem solving, planning and organizing, clarifying roles and objectives, recognizing and rewarding and consulting and delegating. Operators, on the other hand, attributed greater importance to technical skills to be effective leaders.[212] This conclusion to some extent validates English's argument that aircrew perceive that to be effective leaders they must focus on technical leadership. The conclusion that can be drawn from this study in terms of the AERE community is that the execution of current initiatives such as Project EMPENNAGE, which is focused on enhancing AERE technical leadership, is not done at the expense of the development and cultivation of interpersonal leadership behaviours.

In his doctoral thesis, *Assessing Transactional and Transformational Characteristics of Air Force Squadron Commanders: A Case Study*, Shawn L. Black examines leader behaviours of squadron commanders of three flying and two maintenance squadrons. In his conclusions he makes no distinction in the perceived leader behaviours between the commanders of the flying or maintenance units. The study found that squadron commanders were "sometimes transformational and sometimes transactional."[213] However, results revealed that the commanders scored lower in both transformational and transactional leadership behaviours as compared to a 2004 US normative sample. More specifically, commanders scored higher than the normative

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[212]Major Kerry P. Phelan, "Hierarchical Leadership Behaviours of USAF Majors at Air Command and Staff College," (Montgomery: Air Command and Staff College Research Report, 1998), 37-39.

[213]Shawn L. Black, "Assessing Transactional and Transformational Characteristics of Air Force Squadron Commanders: A Case Study," (PhD Dissertation, Capella University, 2006), 93.

group in both active and passive management by exception (MBE) and laissez-faire (LF); behaviours at the transactional end of the Full Range of Leadership (FRL) continuum. Black attributes this to most squadron commanders, particularly pilots, having little personal leadership experience prior to taking command. The survey also revealed that the attributes that subordinates, the majority of whom were NCMs or NCOs, valued most in preferred commanders were strong people skills, trust, honest, and fairness which align with characteristics inherent in transformational leadership. From this study, in terms of its relevance to the CAF, it can be concluded that transformational leadership is generally an appropriate and desirable leadership approach for an Air Force squadron, including maintenance units.

Leadership Analysis

As discussed in Chapter 4, leadership researchers posit that situations influence leadership behaviours. In his book, *Transformational Leadership*, Bass terms this as "situational contingencies" for the emergence of transformational leadership.[214] He refers to J.M. Howell's work which promotes that different environmental and organizational conditions will influences the likelihood of the emergences of exchange (transactional) or charismatic (transformational) leadership, refer to Table 5.1. The situational factors that are considered are environmental, organizational, task characteristics, goals, and leader-subordinate relations.[215] These situational factors are relevant in the study of organizations or cultures, and can be used to make generalizations

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[214]Bass, *Transformational Leadership…*, 49-50.

[215]*Ibid*., 49-50.

regarding the leadership tendencies of an organization. As such, situational contingencies will be used to analyse the leadership tendencies of the AERE culture and its sub-cultures. It is first necessary to describe each factor in greater detail.

Table 5.1 – The Likelihood of Transactional and Transformational Leadership Emergence Under Different Environmental and Organizational Conditions

	Likelihood of	
Situational Factors	**Transactional Leadership**	**Transformational Leadership**
Environmental		
Stability/Predictability	High	Low
Instability/Unpredictability	Low	High
Collectivistic	Low	High
Individualistic	High	Low
Organizational		
Hierarchical authority	High	Low
Dispersed authority	Low	High
Centralized decision making	High	Low
Decentralized decision making	Low	High
Task Characteristics		
Standardized, routine	High	Low
Complex, changing	Low	High
Well-defined performance	High	Low
Poorly defined performance	Low	High
Goals		
Ambiguous Performance	Low	High
Extrinsic Rewards	High	Low
Intrinsic Rewards	Low	High
Leader-Subordinate Relations		
Leader power and information greater	Low	High
Subordinate power and information greater	High	Low

Source: Adapted from Bass, *Transformational Leadership: Industry,Military, and Educational Impact*, 50.

The environmental variables that are considered are the stability and predictability of the situation. In unstable and unpredictable environments, the more likely

transformational leadership will be required; in stable and repetitive environments, transactional leadership will be prevalent. Another environmental factor is the collectivistic or individualistic tendencies of the group. Collectivistic organizations put greater emphasis on group accomplishments than individualistic ones. Additionally, collectivistic organizations are more likely to prioritize the group's interest over their own individual interest for goal attainment. These organizations also value individualized consideration (IC) by leaders including mentoring, coaching, and taking a personal interest in their followers. The moralistic tendencies of collectivistic groups reflect transformational behaviours.[216]

The organizational variables are concerned with the hierarchical or dispersed authority and centralized, and decentralized decision making within the group. Authority and decision making is related to power, where dispersal of power results in greater responsibility assumed by the follower; therefore, it is more likely that transformational leadership or intellectual stimulation (IS) tendencies will emerge. Task characteristics refer to the nature of the task and whether it is standardized and routine, i.e. repetitive; which more readily aligns with transactional or contingent reward (CR) behaviour. On the other hand, tasks can be described as complex, continually changing, and inherently ambiguous which requires more transformational leadership behaviour.[217]

Goal characteristics align closely with task characteristics. If goals or performance measures cannot be readily identified, or the path to goal attainment is not

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[216]Bass, *Transformational Leadership…*, 54-55.

[217]Bass, *Transformational Leadership…*, 58-59.

clear, it is less likely that extrinsic rewards can be associated with the nature of the work. Therefore, it is less likely that contingent reward (CR) and management by exception (MBE), or transactional leadership behaviour will emerge; thus, transformational behaviour is more apt in these situations.[218]

Regarding leader-subordinate relations, researchers propose that where the leader has the power or the information, transformational behaviour is more likely, and where the follower has the power or the information, transactional behaviour or facilitation of an exchange is more likely. Generally, in the case of leader-subordinate relations, it is suggested that transformational tendencies emerge when there is a need to appreciate the role of the follower in the bigger organizational picture, mentor or coach followers, or ensure quality performance.[219]

These situational variables will be used to analyze whether as a culture the AERE community has transactional or transformational leadership tendencies.

AERE vs. Pilot Leadership

A comparative leadership analysis will be made between the AERE and pilot cultures to determine their general leadership tendencies in terms of transactional and transformational behaviours based on the situational variables previously described. For the purposes of the analysis, it is assumed that the AERE culture as a whole reflects a maintenance operations leadership tendency, as AERE leadership development training is primarily focused on AERE officers assuming field or maintenance operations positions.

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[218]Bass, *Transformational Leadership…*, 56.

[219]*Ibid*., 59.

Therefore, the analysis will focus primarily on the maintenance operations perspective of the AERE culture, and flying operations for the pilot culture.

The AERE environment is generally unstable and unpredictable. Typically in an operations environment, AERE officers have a range of subordinates, from a handful in a small section to a number of sections with tens of subordinates. The nature of the work, in simplistic terms, is ensuring aircraft are mission ready for flying operations. It is dependent on numerous variables including personnel, logistics, safety, technical, and airworthiness issues. Maintenance and technical priorities shift constantly depending on operational requirements. Due to the nature of the work and goal attainment, in the form of mission ready aircraft, being largely dependent on the output of the team versus each individual, the AERE culture has collectivistic tendencies.

In contrast, the average line pilot does not have subordinates; as such their focus is relatively narrow. For the purpose of generalization, pilots plan, fly, and debrief their missions. In comparison to the AERE culture, pilots are further removed from the dynamic variables that affect their immediate working environment which results in greater stability and predictability, i.e. if a pilot is scheduled for a flight, as long as an aircraft is ready for the mission, it does not matter to the performance of their mission what went on behind the scenes, logistically or technically, to get the aircraft there. The pilot culture, though dependent on the output of AERE community, i.e. mission ready aircraft, is in large part individualistic in nature.

In terms of organizational characteristics, it is inherent in the AERE culture that authority is dispersed versus hierarchical, and decision making is decentralized. As part

of the nature of the work done in the AEM community, it is understood that technicians, based on their skills, not their rank, will make decisions with respect to the airworthiness and safety of the aircraft they maintain. Due to the AERE officer's relatively wide span of control including personnel, administrative, financial, technical issues, it is intrinsic that AERE culture task characteristics are fluid and complex. As a result of these factors, the goals are less clear and performance objectives are less obvious; as an aside, it is in part for these reasons maintenance metrics have not been adopted universally across the AF because of their subjectivity. Additionally, with respect to leader-follower relationships, generally in the AEM community the AERE culture is expected to keep followers informed as to their contribution to the bigger organizational picture and goals, hence the prevalence of town-halls, and expectation on the part of technicians for their leaders to 'walk the hangar floor.'

In comparison, the pilot's span of control is narrower thus there are less influenced by external variables. As such, task characteristics are typically more routine and goal and performance objectives more evident, i.e. flying a training mission successfully. The small number or complete lack of subordinates result in minimal leader-subordinate relations. Those that do exist, are relatively nuanced and flat; therefore, more transactional tendencies are likely to emerge.

In sum, based on situational contingencies in accordance with J.M. Howell's model, the AERE culture has greater transformational tendencies than that of the pilot. Leadership in the AERE culture can be characterized as largely transformational. The situational factors of the AERE culture including the relatively large follower population, team-oriented nature of the work, and intrinsic ambiguity of maintenance operations

performance objectives, influence the likelihood of the emergence of transformational leadership as compared to the pilot culture. Consequently, AERE officers are better prepared to assume leadership roles in situations that are ambiguous or stressful which require transformational leadership behaviours. Currently, the concepts of transactional and transformational leadership are not included in the AOBC curriculum; therefore, given the CF mandate to teach and adopt emerging leadership models, it is recommended that the AOBC curriculum be adapted to include the Full Range of Leadership (FRL) model as well as the CF Leadership model.

AERE Sub-cultures

As a broader culture, the preceding analysis has shown that the AERE culture has largely transformational leadership tendencies. In Chapter 3 it was proposed that the AERE culture has two dominant sub-cultures: maintenance operations and engineering support. As two sub-cultures with different situational variables, it can be assumed that there may be some differences in leadership tendencies or behaviours; consequently a brief analysis is merited. For the purposes of the discussion it is assumed that situational characteristics for the maintenance operations sub-culture are the same as those discussed in the previous analysis, thus the same logic applies. Only the engineering support culture situational variables will be discussed. As a caveat, it is acknowledged that simplifications have been made; however, this is a comparative analysis.

The majority of engineering support positions are located in DGAEPM in Ottawa; a relatively stable and predictable working environment in comparison to that of maintenance operations. The number of subordinates per work group is small; the bulk

of whom are highly experienced senior NCOs. J.M Howell proposed that experienced subordinates foster the emergence of more transactional behaviour such as management by exception (MBE) than transformational behaviour.[220] Additionally, the span of control is narrower than maintenance operations with the majority of issues limited to those of a technical and airworthiness nature; as such the task characteristics are more standardized and routine which foster the emergence of transactional behaviours. That said, though tasks can be characterized as routine, they typically take longer in engineering support which may require transformational leadership such as individual consideration (IC) or inspirational motivation (IM) behaviour to keep subordinates focused on the goal.

On the whole, the engineering support sub-culture environment can be said to foster the emergence of transactional l

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The majority of military leadership writings and research are concerned with the Army. The leadership research that does exist regarding the Air Force is primarily focused on aircrew, namely pilots. This attention is due in part to Harries-Jenkins "combat-warrior paradigm" [221] and the profession of arms' perception of the military professional in terms of Huntington's traditional model, which reveres those most closely involved in the direct "management of violence."[222] As such, the realm of those who support those directly responsible for the management of violence has largely gone unstudied. Due to its direct support role as part of the Air Ops branch, and its large population in the context of the Air Force, the AEM culture, more specifically the AERE community as AEM leaders, merited closer examination.

The aim of this paper was to determine whether the requirement for leadership in the AERE culture differs from the rest of the Air Force officer population, primarily aircrew, by examining the AERE culture in comparison to the greater military culture, its cultural origins, its homogeneous or heterogeneous nature as a culture, and the effect of these variables on its leadership tendencies.

The AEM and AERE communities are best described in the context of Janowitz's concept of the *Pragmatic Military Professional*, which encompasses occupations that "go beyond the direct application of violence." [223] This approach recognizes the importance

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[221]Harries-Jenkins, *Professional Groups and Subgroups…,* 30.

[222]Huntington, *The Soldier and The State…*, 11

[223]Harries-Jenkins, *Professional Groups and Subgroups…*, 6.

of the technical specialist alongside those, such as aircrew, who more closely align with Huntington's conception of the military professional, as those involved in the management of violence. This is most practically manifested by the AERE community being identified as part of the Air Operations (Air Ops) branch.

However, the AERE culture's place in the broader military culture is best described using Harries-Jenkins' centre-periphery model. This model acknowledges the "combat-warrior paradigm," in which combat-warriors, such as pilots, are placed at the centre, and support functions are placed toward the periphery.[224] In this context, AERE is seen as a combat support specialist, next to the combat-warrior, but unlike other support functions, such as logistics or communications and electronics, which are situated on the periphery as combat service specialists. This dichotomous relationship between the AERE community's identification with the Air Ops branch, and it situation in the broader military as support, does not impact its leadership or leadership development, but does impact opportunities for command.

The AERE culture is based on common Air Force origins and values, though its evolution has been unique. The review of history reveals two distinct sub-cultures, one that finds it origins with pilots accorded technical responsibilities, and the other with origins in the professional specialized engineer. These sub-cultures have evolved but largely persisted into modern day as two unique groups: maintenance operations and engineering support. The presence of these sub-cultures indicates that the AERE culture as a whole is non-homogeneous. However, this heterogeneity is addressed through the articulation and the integrationist application of the AERE culture's values, or core

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[224]Harries-Jenkins, *Professional Groups and Subgroups…*,.30.

competencies: leadership, engineering, and operations (LEO). The engineering competency makes the AERE culture unique, but it is its focus on leadership and operations that attempts to harmonize its differences within itself, and the overarching cultures.

AERE leadership training and development is predicated on support to operations, despite domain of employment. As a result, AERE leadership development is unique in comparison to other occupations in the Air Ops branch, due to the assumption that all junior AERE officers are expected to lead a cadre of NCM/NCOs. In contrast, pilots do not typically lead until they reach the level of Major and Lieutenant-Colonel. Thus, the AERE culture has a strong foundation in leadership. Notwithstanding its strength in this area, generally the AERE officer is not afforded the same command opportunities as other occupations in the Air Ops, namely pilots.

AERE culture leadership is best characterized using Bass's Full Range of Leadership model, which includes both transformational and transactional behaviours. In comparison to pilots, the AERE culture leadership can be described as transformational, which better situates it to lead groups in "times of uncertainty."[225] Intra-cultural leadership differs, however, based on the sub-culture. Maintenance operations is best characterized as transformational, largely due to the unpredictable nature of its business and large followership; in comparison, engineering support is characterized as transactional, due to is static, mainly routine nature, and small followership. As part of the AERE culture's values triad, leadership enables both the engineering and operations competencies. Senior AERE leaders need to be mindful of the current initiatives which

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[225]Northouse, *Leadership: Theory and Practice*, 4th ed ., 175.

focus on the engineering and operations competencies, such as Project EMPENNAGE, to ensure that the leadership component is not negatively impacted and is preserved as one of the Air Force culture's strengths.

Army doctrine's concept of fighting power, which is comprised of physical, intellectual and moral components, is a useful tool for leaders to conceive of any military capability including support.[226] As the Air Force adapts to CF transformation, to become increasingly expeditionary, capabilities-based and result-focused, its leaders need to be cognizant of the synergistic effects of the components of its fighting power.[227] To date, the majority of attention has been paid to the more tangible physical and intellectual components, due to the immediate requirement for capabilities and training. The moral component of the Air Force, particularly culture and leadership, has been largely disregarded. It behoves Air Force leaders, at all levels and in all communities, to focus on this largely human dimension, to better guarantee the execution of the physical and intellectual components. In the words of John P. Kotter:

> Just as we need more people to provide leadership in complex organizations that dominate our world today, we also need more people to develop the cultures that will create that leadership. Institutionalizing a leadership-centred culture is the ultimate act of leadership.[228]

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[226]Department of National Defence, B-GL-300-001/FP-001 *Land Operations DRAFT*, 4-1/36.

[227]Department of National Defence, B-GA-400-000/FP-000 *Canadian Forces Aerospace Doctrine*, ii.

[228]Kotter, "What Leaders Really Do," 111.

Recommendations

As expressed in the introduction, it was intended that this paper would provide a largely anecdotal foundation upon which further research could based with respect to the AERE and AEM cultures. Given the extreme lack of leadership and cultural research regarding the Air Force, it is recommended that empirical leadership studies be carried out for the Air Force as a whole, and for its sub-cultures; more pointedly, the AERE culture. The purpose of this research would be to determine the most prevalent forms of leadership in the Air Force, in order to structure its leadership training accordingly. It is acknowledged that CF leadership doctrine promotes the CF leadership model for training purposes; however, it is this same doctrine that recognizes that different cultures within the CF have different leadership styles.[229]

It is recommended that an empirical Institutional/Occupational (I/O) analysis be carried out in the AERE community. The purpose would be to determine whether there is a distinction in mindset of the maintenance operations and engineering support sub-cultures, between institutional and occupational tendencies. The results of such an analysis may aid leaders in determining if there is a need for integrationist initiatives to preserve a largely homogeneous culture, such as career path streaming and cross-training.

As historical research for this paper proved difficult, due to the lack of formal documentation regarding the AERE and AEM communities, it is recommended that the AERE Council commission a history of the AEM community, including background on the AERE and Air Tech occupations. Such a document would allow future leaders to better understand the underpinnings of the culture. Furthermore, it is suggested that the

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[229]Department of National Defence, A-PA-005-000/AP-001 *Duty with Honour*, 53.

vision, mission, values, and core competencies of the AERE community be formally documented, including their origins and original intent. Both the AERE history and community tenets should be incorporated into the AERE training curriculum to expose junior officers to the origins of their culture, as well as providing them with an appreciation of the founders and leaders, values and beliefs. Such an initiative would serve to strengthen and unite the AERE culture.

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