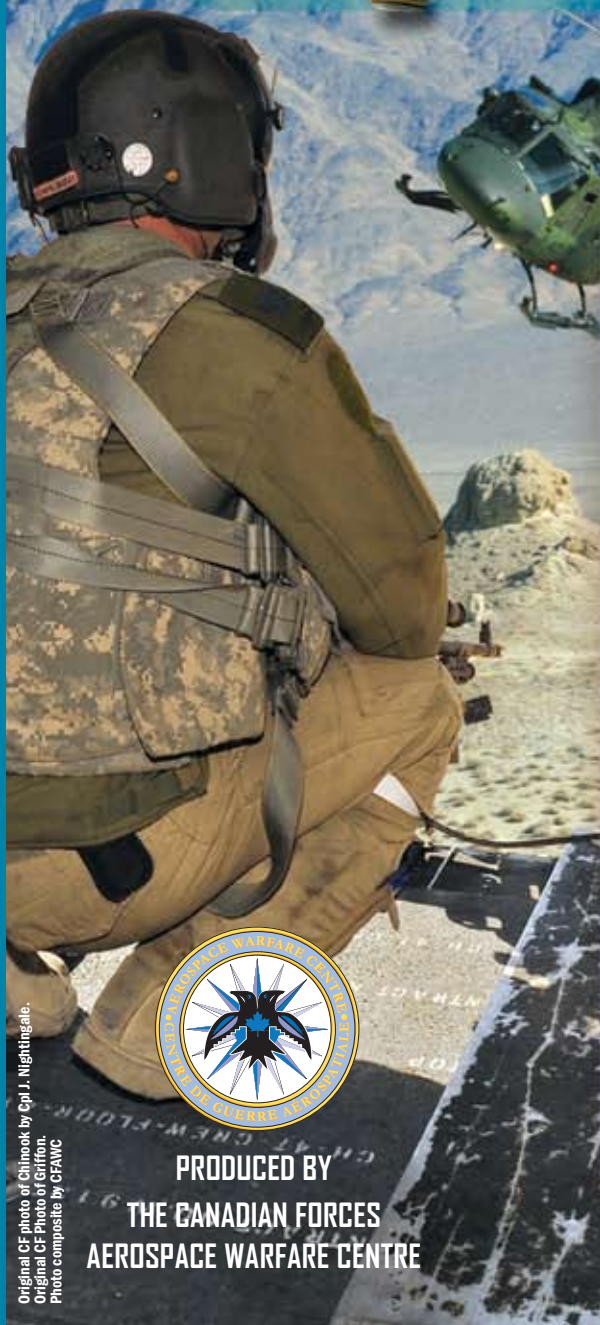SPRING 2009
Vol. 2, No. 2

THE CANADIAN

AIR F✶RCE JOURNAL

IN THIS ISSUE!

Automation Airmanship:
Optimizing Aircrew Performance
in a Modern Air Force

**Multinational
Interoperability Council
and Coalition Building**

**Reflections and Questions
on Ethics**

BOOK REVIEWS:

Fire and Fury:
The Allied Bombing of Germany 1942-45

No Clear Flight Plan:
Counterinsurgency and Aerospace Power

& MUCH MORE!

PRODUCED BY
THE CANADIAN FORCES
AEROSPACE WARFARE CENTRE

Canadá

National
Defence

Défense
nationale

ORDER YOUR BOOKS NOW!

Canadian Air Force Leadership and Command
 The Human Dimension of Expeditionary Air Force Operations (English only)

Effects-Based Approaches to Operations:
Canadian Perspectives (English only)

The Canadian Air Force Journal Spring 2008 • Vol. 1, No. 1

The Canadian Air Force Journal Summer 2008 • Vol. 1, No. 2
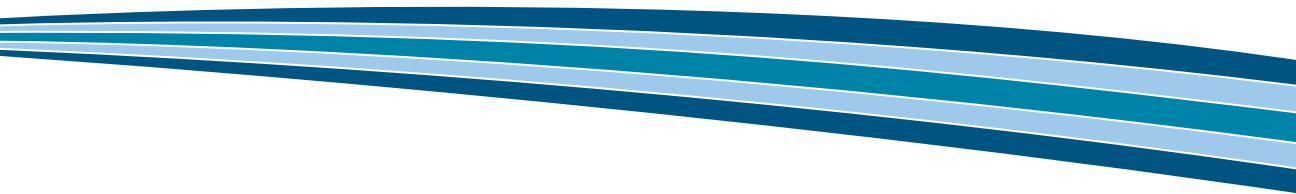
The Canadian Air Force Journal Fall 2008 • Vol. 1, No. 3

The Canadian Air Force Journal Winter 2009 • Vol. 2, No. 1

These publications are available upon request.
Email: Anne.Pennington@forces.gc.ca

THE CANADIAN
AIR F⊕RCE JOURNAL

SUBMISSION REQUIREMENTS

The *AIR FORCE JOURNAL* welcomes the submission of articles, book reviews and shorter pieces (which will be published in the Letters to the Editor, Points of Interest and Pushing the Envelope sections) that cover the scope of Air Force doctrine, training, leadership, lessons learned and Air Force operations: past, present or future. Submissions on related subjects such as ethics, technology and Air Force history are also invited.

JOURNAL SECTIONS

Item	Word Limit*	Details
Letter to the Editor	50-250	Commentary on any portion of a previous *Journal*.
Article	3000-5000	Written in academic style.
Book Review	500-1000	Written in academic style and must include: • the book's complete title (including sub-title); • the complete names of all authors as presented on the title page; • the book's publisher, including where and when it was published; • the book's ISBN and number of pages; and • a high resolution .jpg file (at least 300 dpi and 5 by 7 inches) of the book's cover.
Point of Interest	250-1000	Information on any topic (including operations, exercises and anniversaries) that is of interest to the broader aerospace audience.
Pushing the Envelope	250-2000	Forum for commentary, opinions and rebuttal on *Journal* articles and/or issues that are of interest to the broader aerospace audience.

* Exclusive of endnotes

AUTHORS ARE ASKED TO NOTE THE FOLLOWING GUIDELINES

• Submissions may be made in either official language.

• Authors must include a brief (one paragraph) biographical sketch which includes current appointment /position, telephone number and email address. Please include all professional and academic designations as well as military decorations.

• All submissions will be peer reviewed. The Editor will notify contributors on the status of their submission. It may not be possible to publish all submissions.

• All text submissions must be digital, in Microsoft Word or rich text format. Files must not be password protected and must not contain macros. Files may be submitted by mail or email at the addresses provided below.

• All supporting tables, images and figures that accompany the text should be sent in separate files in the original file format (i.e., not imbedded in the text). Original vector files are preferred; high resolution (not less than 300 dpi) .psd or .jpg files may be submitted.

• Copyright permissions are required for all material that is not Department of National Defence or author originated. It is the author's responsibility to obtain and submit the necessary written permissions which must include the author's/artist's name as well as the publisher's name and location. Any submissions not meeting these requirements may be omitted from the article.

• The Editor may select images or create graphics to accompany submissions.

• Authors should use *Oxford English* or *Petit Robert* spelling. When required, reference notes should be endnotes rather than footnotes and formatted in Chicago style. For assistance refer to *The Little, Brown Handbook*, *Le guide du rédacteur* or CFAWC Production Section at Francoise.Romard@forces.gc.ca.

• Acronyms and abbreviations should be used sparingly:
  ○ If they are required in the text, the term is to be written out in full the first time it is used followed by the abbreviated form in brackets.
  ○ If they are required in tables or figures, each table and figure will contain a list of abbreviations.
  ○ A list of all abbreviations (and their terms) used in the text will be included at the end of each submission.

• The Editor reserves the right to edit submissions for style, grammar and length, but will not make editorial changes that will affect the integrity of the argument without consulting the author.

FOR FURTHER INFORMATION OR TO MAKE A SUBMISSION PLEASE CONTACT THE EDITOR AT:

Canadian Forces Aerospace Warfare Centre
8 Wing Trenton
Box 1000 Stn Forces
Astra, Ontario K0K 3W0
Attn: Major William March

William.March@forces.gc.ca

CALL FOR SUBMISSIONS
For the Fall 2009 issue of
The Canadian Air Force Journal
Deadline: 31 July 2009

DISCLAIMER

IN THIS ISSUE

The Canadian Forces CH147 D Acceptance and Accreditation Team receives the first Chinook model D from the US Army Acceptance Team.
CF Photo by Cpl A. Saunders

Wing Commander of Joint Task Force Afghanistan Air Wing (JTF-Afg Air Wing) Colonel Christopher Coates
CF Photo by Cpl J. Nightingale

EDITOR'S
MESSAGE

One of the interesting things about this issue of the *Journal* is the temporal span of the submissions. One article sets its sights clearly on preparing the aircrew for the 21st century, while another deals with air power doctrine development in the 1920s and 30s; the final two address the timeless issues of interoperability and ethics. One book review examines the ongoing controversy surrounding the Allied bombing campaign in World War II while the other covers both the history and future of air power and counter-insurgency warfare. Then the two Pushing the Envelope pieces offer opinions on how our staff system developed and perhaps where it should go in the future. All in all, they provide an excellent "backdrop" to our Points of Interest item which highlights the Golden Hawk F86 Sabre project undertaken as part of the Centennial of Flight celebrations scheduled for 2009. For surely the rich history, impact and evolution of air power, explored in part by the submissions in this *Journal*, cannot help but make you wonder what will happen in the next hundred years. Definitely something to think about when you watch the Sabre carve its way through the sky … .

Major William March, CD, MA
Senior Editor

Automation Airmanship:
Optimizing Aircrew Performance in a Modern Air Force

By **Lieutenant-Colonel Colin Keiver, CD**

442 Squadron's Cormorant CH149902 hovers above the bow of the HMCS BRANDON, a maritime coastal defence vessel, during a training exercise off Esquimalt Harbour, Vancouver Island, British Columbia.
Photo by Cpl J. Morin

"The quality of the box matters little. Success depends upon the man who sits in it."[1]

Baron Manfred von Richtofen
"The Red Baron"
1918

On the night of July 12, 2006, the crew of Tusker 914, in a CH149 Cormorant search and rescue helicopter, departed 14 Wing Greenwood to conduct practice night boat hoists with the Canadian Coast Guard. Tragically, while approaching the hover in the vicinity of Canso, Nova Scotia, the aircraft impacted the water and three crewmembers lost their lives. The causes of this accident, which have been well documented in the Flight Safety Investigation Report, were directly related to the pilots' use of the aircraft automation and a loss in situational awareness. In short, the causal factors in the loss of Tusker 914 were directly attributed to human factors.[2]

This accident served as a catalyst for a deliberate effort within the Air Force to assess its ability to safely and effectively operate modern, highly automated and integrated aircraft like the Cormorant. This effort has been made even more relevant by the significant investment in modern aircraft for the Air Force by the Government of Canada. Created in conjunction with the development of the 1 Canadian Air Division Automation Philosophy, the Automation Policy and Planning Development (APPD) Project was initiated in 2008. The APPD Project is complete and its findings, conclusions and recommendations have been accepted by the Air Force. They indicate a requirement for significant cultural change within the organization and will require a protracted and deliberate effort to address. At its base level, the APPD Project is primarily concerned with developing a robust human factors program that optimizes aircrew performance

to fully exploit the new technologies being delivered to the Air Force. This optimal level of performance can best be described as "automation airmanship," and its development and sustainment are critical to preventing further accidents like Tusker 914. Achieving optimum levels of performance is entirely dependent upon the ability of the Air Force to focus (lead, coordinate and advocate) efforts aimed at delivering automation airmanship.

BACKGROUND

The methodology applied to automation efforts within the Air Force has been the "Four P" model, a strategy developed by the National Aeronautics and Space Administration (NASA) Ames Research Center. The four Ps are philosophy, policies, procedures and practices and it is only through the deliberate development of the first three in sequential order that the desired practices are achieved on the aircraft.[3] With the creation of the 1 Canadian Air Division Automation Philosophy in 2007, the APPD Project was the next logical step. Conducted primarily by contracted personnel, with significant developmental and operational human factors experience in military and civil automated aircraft, it included coordination and liaison visits with senior Air Force leadership; fact-finding visits with staffs, projects and engineering organizations; a review of all flying publications and manuals; and fly-along observations of aircrew in several different fleets across Canada. The project was intended to provide a foundation for subsequent activities in the development of both policies and procedures. It also analysed in detail the gaps that exist between current operations and

operations that fully reflect the objectives of the Automation Philosophy.

It is not the physical ability or inability of the aviator to fly an instrument approach to minimums and execute a landing or to execute an approach to the hover for a night hoist that causes the vast majority of civil and military accidents. Rather, accidents are usually the result of the mental ability or inability of the crew while flying that approach or any other manoeuvre. In other words, the causes of the vast majority of accidents in aviation are related to human factors, just as they were in Tusker 914. It is the ability of the aviator to use all available resources to their maximum potential, including the aircraft systems and crew (or the wingman), to "trap" errors and to operate within the limits of cognitive effectiveness that allows them to develop a high level of situational awareness and determines whether or not the approach is successful. For this reason, automation efforts are in fact targeted at the entire organization. As the aircraft continues to evolve, and the ways in which it interacts with the crew continues to evolve, so too must the way in which the Air Force approaches the training and qualification of its aircrew to operate that aircraft. Therefore, current automation efforts are concerned with the human-factors aspects of modern aircraft and ensuring the Air Force has properly positioned itself to safely and effectively operate them.

THE APPD PROJECT AND ITS LESSONS

The APPD Project observed the following three distinct areas within aircrew that were best able to achieve the Automation Philosophy:

- Clear aircrew automation task definition throughout all flight documentation supported by clearly-defined automation performance measures and standards.

- Flight procedures and documentation that support the development and maintenance of a robust automation culture.

- Aviator flight discipline is incorporated into procedures and automation policy.[4]

Aircrew on aircraft procured and operated on the basis of civil-compliance certification, such as the Airbus A310, generally performed at a high level due to the reliance on industry operating methodologies and documentation to achieve operational readiness. The analysis also revealed that overall aviator experience is not necessarily an accurate predictor or indicator of the flight crew's automated flight performance. One of the most effective crews observed consisted of two recent graduates of the new multi-engine syllabus at Southport that fully incorporates industry best practice automated training methodologies and flight procedures. The exposure to appropriate automation training and the measurement of performance with respect to automation that are embedded in the syllabus enabled this relatively inexperienced crew to perform at a high level.

There were several cause factors attributed to crews who did not exhibit a high level of automated flight performance. In all cases, these crews were missing at least one or more of the three identified areas. When examining the overall effectiveness of these crews, it became necessary to consider not just their flight performance, but all aspects of the Air Force that directly or indirectly contribute to that performance, or "practice," in operations. As a result, the scope of the findings within the APPD Report[5] is significant.

AIR FORCE PUBLICATIONS

The APPD Project concluded that current orders and manuals lack coherence and do not contain policy identified within industry, both civil and military, to support the operation of modern aircraft. Several changes and additions to 1 Canadian Air Division Orders are required to implement the Automation Philosophy. In concurrence with the development of new policy, the APPD Report recommends that the Air Force considers developing a flight operations manual. This manual would replace the current

1 Canadian Air Division Orders Volume 3 and would become a single reference document to replace the multiple, and often contradictory, references aircrew are currently required to use in the conduct of operations.

The APPD Report also concluded that flight procedures and documents currently in use within the Canadian Forces (CF) are not adequate to support the Automation Philosophy. Critical flight documents such as aircraft operating instructions, flight manuals, standard manoeuvre manuals and aircraft operating checklists reflect a wide variety of guidance, in some cases contradicting themselves within the same fleet. They differ in terms of content, language, terminology and organization and do not reflect industry best practices with regard to the operation of modern, highly automated aircraft. Deliberate effort is required to standardize and harmonize flight procedures and documentation within and across all fleets where able, while concurrently incorporating the changes to procedures and documents mandated by the introduction of new technologies. Not only will this significantly increase overall standardization, effectiveness and safety, it will directly contribute to reducing, or "streamlining," training requirements as individual aircrew transition from ab-initio training into and between the various operational communities.

As an example, it was observed that there are multiple methods of calling a rejected take-off within the multi-engine communities that include the use of the terms reject, abort and malfunction. While each term is valid and trained to a high level, the fundamental question becomes, "What term is taught to the pilot trainees in the multi-engine school and why do those individuals then need to learn something new depending on which operational fleet they join?" In addition to the efficiencies gained in the pilot training continuum by using the same term, there is a fundamental human-factors issue to consider that determines whether or not the aircrew can communicate critical safety of flight

information. This is entirely dependent on the ability of successive training systems to ensure the method used to perform the task in previous fleets has in fact been replaced with the method of performing the task in the new fleet.[6]

AUTOMATION PERFORMANCE MEASURES AND STANDARDS

Fundamental to the shortcomings observed during the APPD Project are the lack of clearly defined automation performance measures and standards, both from an Air Force perspective and within individual fleets. The analysis revealed that they simply do not exist and as a result, aircrew performance in all areas of Air Force training and operations is negatively affected. The Air Force does not define the level of automated performance it expects from its crews and does not, therefore, measure whether or not its crews achieve that level. This also directly impacts the ability of the Air Force to effectively create a common culture and language that permits the organization to efficiently describe and communicate issues associated with automated flight performance in current and future aircraft. Issues that affect all aircraft, regardless of type or level of complexity, "are not able to be fully described through daily operations, simulator and aircraft training, maintenance, staff support requirements, lifecycle [sic] issues, and designing the requirements for future aircraft acquisitions, upgrades and support."[7]

AIRCREW TRAINING TODAY

The APPD Project has concluded that current CF aircrew training and evaluation methods are not capable of supporting the implementation and sustainment of the Automation Philosophy. They rely on individual proficiency in performing technical skills largely attained through a prescribed "hours" based program. This is manifested in the current practice of delivering most training and evaluation through single-pilot, manoeuvres-based events in all multi-crew fleets. Many of the skills required to safely and effectively fly complex multi-crew

aircraft are neither defined in current training guidance nor are they evaluated. It represents an incomplete assessment of the crew's ability to effectively operate the aircraft in line operations, where they are expected to function as a crew. Basic "hands and feet" skills are fundamental to all successful aviators, but those skills are pursued and evaluated to the detriment of other critical flying skills required in an automated aircraft. The style of flight evaluation currently employed across the Air Force, in which a training pilot/evaluator occupies one of the crew seats, does not promote the requirement for close coordination of tasks between all crew members in all phases of flight in order to safely and effectively fly modern, automated aircraft.[8]

SIMULATION IN THE AIR FORCE

The reliance on legacy training and evaluation criteria is manifested in the use of simulation. The APPD Report describes the current attitude towards simulation in the Air Force as "Sim-Phobic."[9] Emphasis is placed on actual aircraft utilization and current policies rank the aircraft as a more effective training aid than simulators. Modern simulators are designed to replicate the task demands on an aviator in terms of perception, attention, decision making, memory and action while allowing the crew to juggle multiple tasks, supervise automated subsystems, maintain situational awareness and develop an accurate mental model of aircraft dynamics in order to achieve mission success. While full-motion, high-fidelity training devices have the potential to create an extremely realistic training environment, research shows that most of the procedures and cognitive emphasis required to train safe and effective aircrew can be delivered via less costly means.[10] In many fleets, the Air Force already possesses the simulators required to begin developing a robust automation culture but is failing to use them.

Current practice also fails to recognize that replicating the warnings, cautions and advisories associated with the failure of multiple interconnected subsystems on modern aircraft, and the required crew reactions/ interactions to effectively deal with those situations, can only be done in a simulator. On a CC130H there are approximately 60 aural warnings or annunciations and warning, cautionary and advisory lights that the aircrew are expected to react to during operations. On a C130J, there are in excess of 780.[11] The ability to successfully resolve an abnormality or malfunction on a modern aircraft requires the crew to function at a very high level and to deal effectively with a cascading and sometimes contradictory information flow, while still adhering to the fundamental principles of "aviate, navigate and communicate." Teaching and evaluating these skill sets in the actual aircraft, in which none of the annunciations or warnings are present due to the event being "simulated," with an instructor or evaluator occupying one of the crew seats is not effective. Using simulators to teach and evaluate these new, fundamental skill sets requires fundamentally different methodologies from those currently being used in the majority of Air Force simulators.[12]

THE CANARY IN THE COAL MINE

Although the Air Force has invested significant time and effort into the Human Performance in Military Aviation (HPMA) Program, designed to replace the traditional Crew Resource Management Program, the APPD Project found little evidence of its use in operations. There are two fundamental reasons for this. The first is that the Air Force has not created HPMA performance measures and standards. Aircrew are educated in the concepts of HPMA but they are not trained to use them nor evaluated on that use in the aircraft. This is reinforced by the culture of single-pilot, vice crew, training and evaluation.

The second reason is that HPMA concepts have not been designed and integrated into Air Force normal and abnormal operating procedures. Aircraft operating procedures which have been developed and designed with careful consideration and integration of HPMA concepts can have powerful positive results for the disciplined aircrew. Even the

"most difficult HPMA converts" can perform at very high levels of HPMA by virtue of well designed operating procedures that they are evaluated against. Attitudes and personality differences mean less when operating with procedures created with an embedded HPMA strategy. In fact, HPMA and automation airmanship become the same measures and standards in a well-developed automation culture.[13]

The relative failure of the HPMA Program is revealing and provides a valuable lesson about cultural change. Regardless of good intentions and a great deal of effort by a dedicated, skilled staff, meaningful change in behaviour on the flight deck does not take place until it is first legislated through orders and regulations and then assessed for compliance. Until these two principles are applied, widespread behavioural change will not occur. Failure to recognize the shortcomings in the successful implementation of the HPMA Program must be learned and applied to the development of an automated culture if it is to be successful.[14]

THE FLIGHT SAFETY SYSTEM

The analysis conducted by the APPD Project included the flight safety system and an examination of flight safety occurrences since 1998, the year the CC130 Avionics Update Project came on-line. It concluded that due to the absence of both automation and HPMA performance measures and standards, the flight safety system is challenged to identify and report automation and human factors related issues.

There is a flight safety investigation report for a CH149 Cormorant incident dated July 2004 contained within the APPD Report. The human factors and automation causes in the 2004 report are virtually identical to the cause factors surrounding the loss of Tusker 914. The July 2004 incident also predates the maintenance issues with the Cormorant helicopter, and associated loss of aircrew proficiency, that were cited as latent causal factors in Tusker 914. In both cases, the automated systems on the aircraft were used inappropriately resulting in a failure, which was further exacerbated by the crew's reaction to that failure. The only significant difference between the July 2004 incident and Tusker 914 was that in the first incident the aircraft pitched up and away from the water instead of down and towards the water.

The failure to create a common language and culture as it pertains to automation is hampering the ability of the Air Force to both identify and learn from automation related incidents. Incidents are instead generally treated as "one-of" events with little or no real corrective measures adopted either within or amongst fleets.

"STOVEPIPES OF EXCELLENCE"

The APPD Project concluded that the Air Force structure has evolved into strong vertical organizations that operate as "stovepipes of excellence" along fleet lines, with little or no transfer of information between the stovepipes. Whether it is the shortcomings of the HPMA Program, the wide variance in standard manoeuvre manuals, or the differences in basic flight deck terminology, the Air Force is not achieving levels of standardization and synchronization that would allow it to effectively implement and sustain the Automation Philosophy. It is expending effort on basic, common problems that are being solved with multiple independent solutions within different fleets requiring multiple support systems to sustain. This is having a significant impact on already overstretched resources, both in terms of personnel and funding. In other cases, such as the CH146 Griffon simulator program or Wolf Net, solutions have been developed that are a model to emulate but which others have not adopted.

The APPD Report recommends that an Air Force standards organization be created. This organization would develop and implement the required Air Force policy statements, create the required performance

measures and standards that directly contribute to the development and implementation of procedures to support those policy statements, and then spearhead their implementation to achieve the desired practices. This standardization effort, and the development of a robust automation training system with performance measures and standards like those found in the new multi-engine syllabus at Southport, will allow the CF to transition to a "pipeline" Air Force. This standardization effort will also directly facilitate the introduction of upgraded or new aircraft fleets. The Air Force standards organization would be the means by which the Air Force creates a common language and culture of automation and begins to effectively communicate across all functional areas.

THE REAL CAUSES OF TUSKER 914

> *"While the most common explanation for an accident is operator error, a more frequent cause is faulty design of the sociotechnical system (that is, people and technology in combination) in which the operator is embedded."* [15]
>
> Marc Gerstein

The crew of Tusker 914 was armed with everything the Air Force viewed as essential to the safe and effective operation of a CH149 Cormorant in terms of training, qualifications and equipment. There was a qualified pilot instructor onboard and the total flight time of all three pilots was in excess of 10,000 hours. It was an experienced CH149 crew supported by a chain of command that was confident in their ability to execute the assigned mission. Significantly, almost all of the findings of the APPD Project were described in the Tusker 914 Flight Safety Investigation Report. Cormorant pilots were being trained using single-pilot, manoeuvres-based methodologies; HPMA and automation performance measures were non-existent; standardization was an issue; and the changes required in training and operating methodologies as a result of the introduction of new technologies

had not been captured. British simulator instructors who observed Cormorant training stated that "in comparison to other EH 101 operators, the CH149 pilots were permitted too much variability in how they performed their procedures, set up their displays and handled malfunctions."[16] In general, it was their opinion that better and more detailed descriptions of standard operating procedures in the CH149 Standard Manoeuvre Manual would be beneficial. Finally, they remarked that they commonly saw CH149 pilots using techniques that they felt were a carry-over from the non-automated, manual flying procedures used in the CH113/A Labrador.[17]

The fundamental determinant of success in the application of aerospace power, regardless of the mission, is the way in which the aviator manages competing task demands, ambiguity and operational pressures. The training and tools that the Air Force gives to warfighters to execute their assigned missions are critical in determining whether or not the mission is successful. All aviators, regardless of experience, are prone to error and vulnerable to characteristic forms of error based on the limits of cognitive ability that all share, whether civil or military. More importantly, individual actions and errors are not the source of accidents but more often a result of systemic causes.[18]

For much of the last 40 years, the Air Force has struggled with systemic problems that have impeded change efforts and resulted in ad hoc responses to change requirements. This has included the lack of an effective lessons learned capability. The disjointed and often dysfunctional nature of Air Force command and control has significantly impacted the ability of the Air Force to formulate policy and deal effectively with recent challenges.[19] The loss of Tusker 914, and the findings within the APPD Report, is a manifestation of these systemic problems starting with a failure to develop policy appropriate to the operation of modern aircraft. The "Swiss Cheese Model" of error, developed by James Reason, has been widely
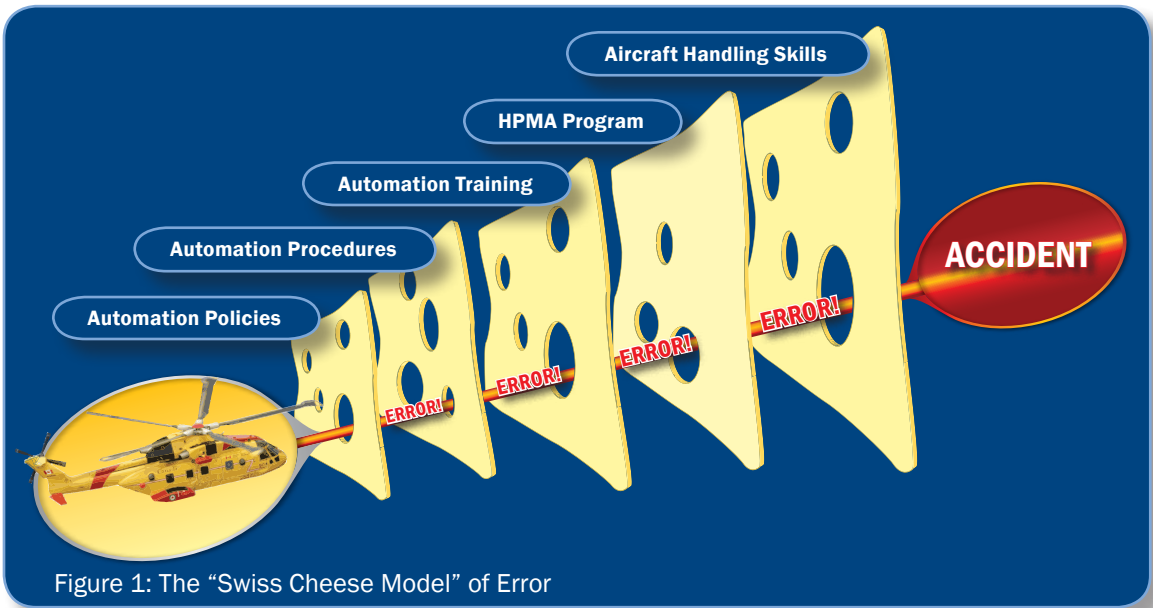
Figure 1: The "Swiss Cheese Model" of Error

accepted in aviation as a means of explaining human performance within the broader context of the system in which the humans are operating. Simply put, if the slices of cheese represent the layers of defence against error, the holes represent potential shortcomings in that layer. Accidents are prevented when the organization is able to prevent the holes from lining up.[20] As confirmed in the APPD Report, and depicted in Figure 1, the systemic failings of the Air Force to deliver policy, procedures and training relevant to automated aircraft, coupled with the weaknesses in the HPMA Program, left the crew of Tusker 914 with only basic aircraft handling skills as a defence. When those were used in a manner incompatible with the automation, the "holes" aligned and the accident was the result.

THE SOLUTION

The Air Force must develop and implement a robust culture of automation airmanship to optimize aircrew performance in the 21st century and must use 21st century methods to achieve it. Automation airmanship will demand new skills, knowledge and attitudes to safely and effectively achieve mission success. It must be a standardized, disciplined and integrated operating strategy that uses all available resources on an aircraft, including the crew and aircraft systems. Automation airmanship will integrate

traditional technical skills, automation skills and human factors skills to achieve optimum situational awareness and mission effectiveness. Its development will permit the Air Force to be responsive to, and exploit to the maximum extent possible, advances in aircraft technology, operations and training methodologies. Delivering it will require the deliberate, coordinated and systematic development of policies and procedures across the Air Force to support the Automation Philosophy.

IMPLEMENTING THE SOLUTION

The critical first step in developing automation airmanship is to address what Allan English has properly identified as the disjointed and dysfunctional nature of current Air Force command and control relationships. These shortcomings directly contributed to the systemic failings evident in the loss of Tusker 914 and subsequently confirmed in the APPD Report. This mandates the creation of an Air Force standards organization, through a rationalization or realignment of current structures, which is able to lead, advocate and coordinate the various components essential to the development of automation airmanship. Concurrently, the Air Force must create the overall governance, or doctrine, necessary to give the new Air Force standards organization the foundation it requires. The ongoing debate

on how best to structure Canadian aerospace forces and exercise command and control must consider the deeper, latent flight safety factors brought about by a failure to effectively develop, implement and coordinate policy on a wide range of issues. The potential stand-up of other command functions must ensure the development of decision rights and information flows that do not currently exist within the strong vertical stovepipes identified within the APPD Report. Future Air Force-wide initiatives will find themselves attaining the same level of success as the HPMA Program while incurring the risk of losing additional, hard to replace aircrew and aircraft, unless these systemic failings are addressed.

As the issues of structure are resolved, concurrent activity can begin on the development of policy and procedures in coordination with the various projects, operational communities and individual fleets. There exists an immediate need to address automation airmanship issues in transitional fleets such as the Aurora upgrade project, the Maritime Helicopter Project and the C130J project. The required levels of expertise do not currently exist within the CF and it is expected that continued contracted assistance will be necessary in the short to medium term to begin addressing the issues identified in the APPD Report, to include direct developmental assistance to the initial operations of the Air Force standards organization. Achieving and maintaining the desired levels of automation airmanship across the Air Force is readily within reach provided the requisite doctrine, structure and focus are dedicated to the effort.

A POTENTIAL END STATE

There are several examples of coordinated and highly effective training and operating systems within the aviation industry that the Air Force can use as a model. The most promising one is the Advanced Qualification Program (AQP) currently in use, to varying levels, by several civil and military organizations. The primary goal of AQP is to achieve the highest possible standard of individual and crew performance.[21] In order to achieve this goal, AQP seeks to reduce the probability of crew-related errors by aligning training and evaluation requirements more closely with the known causes of human error. It recognizes that the capabilities and use of simulators and other computer-based training devices in training and qualification activities have changed dramatically and allows operators to develop innovative training and qualification programs that incorporate the most recent advances in training methods and techniques. Achieving these benefits requires the deliberate and coordinated development of policies to support wide-scale implementation. The direct benefits of AQP are as follows:

- **Crew Performance**. Current Air Force training programs focus on individual training and evaluation. Under AQP, the focus is on individual and crew performance in both training and evaluation.

- **HPMA**. Most accidents are caused by errors of judgement, communication and crew coordination. Current training programs focus primarily on flying skills and systems knowledge. Under AQP, competence in flying skills and systems knowledge are integrated with HPMA skills in training and evaluated throughout the curriculum.

- **Scenario-Based Training and Evaluation**. Most accidents are caused by a chain of errors that build up over the course of a flight and which, if undetected or unresolved, result in a final, fatal error. Traditional CF training, with its manoeuvre-based training and evaluation, artificially segments training events in such a way as to prevent the realistic buildup of the error chain. Under AQP, both training and evaluation are scenario-based and simulate more closely the actual flight conditions known to cause most fatal aviation accidents.

There are additional well-documented benefits to AQP that would lend themselves to automation airmanship and have a direct

and positive impact on other Air Force initiatives such as increasing pilot production and absorption. These include the ability to rapidly modify training curricula, media and intervals; improved standardization across fleets and aircrew; and the movement from programmed flying hours to proficiency-based training. Finally, the development of a successful "closed-loop" AQP requires a robust data management system in the background that directly facilitates the implementation of other critical flight safety and standardization functions already deemed to be essential within the Air Force, but currently not in existence, such as flight data monitoring.[22]

Many of the functional elements required to achieve an "AQP-like" system already exist. However, they have either failed to live up to their potential or will not deliver the promised benefits due to the systemic leadership, coordination and advocacy issues that plague the Air Force today. AQP compatible elements include the well-developed Instructional System Design model (in the CF it is known as the Canadian Forces Individual Training and Education System [CFITES]), the Canadian Aviation Synthetic Environment (CASE) Project and the Air Force Individual Integrated Learning Environment (AFIILE) Project. Achieving and maintaining a high level of automation airmanship will require a deliberate and coordinated approach to their implementation and use.

CONCLUSION

The failings in automation airmanship that directly contributed to the loss of Tusker 914 were, in fact, the result of systemic Air Force failings and are a call to action. Addressing the disjointed and dysfunctional nature of current Air Force structures and processes is critical to solving the issues identified in the APPD Report. Dealing with the vertical stovepipes and implementing Air Force solutions to identified shortcomings in areas such as 1 Canadian Air Division Orders, standards development and training methodologies will quite likely address other problems the

Air Force finds itself struggling with. The attainment and sustainment of a high level of automation airmanship that supports the Automation Philosophy, or the desired "practices" in operations, will require a deliberate and focused effort to deliver complementary and coordinated policies and procedures. Failure to implement and sustain a high level of automation airmanship will prevent the Air Force from being able to fully exploit both the technical and human potential it either currently possesses or will take delivery of in the future. The message of the Red Baron from over 90 years ago rings as true today as it did then. The Air Force must continue to develop and implement the means to achieve a high level of aircrew performance if it is to safely and effectively exploit the capabilities of the "box" our aircrew find themselves sitting in. That demands that it find the means to achieve a high level of automation airmanship. ■

ACKNOWLEDGEMENTS

List of Abbreviations

AFIILE	Air Force Individual Integrated Learning Environment
APPD	Automation Policy and Planning Development
AQP	Advanced Qualification Program
CF	Canadian Forces
CFITES	Canadian Forces Individual Training and Education System
HPMA	Human Performance in Military Aviation
NASA	National Aeronautics and Space Administration

While on exchange from 2001–2004, Lieutenant-Colonel Colin Keiver was the Director of Safety and Standardization at the first United States Marine Corps KC-130 squadron to convert to the KC-130J. His "love affair" with the field of human factors and the impact of automation on aviation was born during that time. In 2004 he was posted to A3 Transport in 1 Canadian Air Division Headquarters where he was heavily involved with introducing the C17 into service and developing the C130J project. In addition to functioning as the Project Authority for the Automation Policy and Planning Development Project, he is attending classes at the University of Manitoba with the aim of completing that which he should have completed 20 years ago—a degree.

NOTES

1. Manfred von Richtofen, *The Red Fighter Pilot* translated by J. Ellis Barker (London, UK: 1918) Chapter 12. Available online at http://www.richthofen.com/index.htm (accessed January 21, 2008). Originally published as *Der Rote Kampfflieger* (1917).

2. Directorate of Flight Safety, *Flight Safety Investigation Report 1010-149914* (Ottawa: Directorate of Flight Safety, 22 January 2008).

3. Asaf Degani and Earl L. Weiner, *On the Design of Flight Deck Procedures* (Moffat, CA: NASA Contractor Report 177642, Prepared for NASA Ames Research Center, 1994).

4. Flight discipline, within the context of the APPD Project, can be defined as doing the same thing, the same way, every time. It is not a reflection on the overall professionalism of the crews and their adherence to orders and procedures. In fact, the APPD Project observed extremely professional aircrew throughout the analysis. Rather, it refers to the overall levels of reliability and predictability within observed aircrew. This has a direct bearing on the ability of aircrew to form common mental models of the flight dynamics of the aircraft which, in turn, are used to maintain situational awareness and execute sound judgement. Flight discipline, in this context, is directly linked to standardization.

5. R. D. Kobierski and C. Stickney, *Automation Analysis Report* (Winnipeg, MB: Air Force Automation Policy and Development Project, 29 September 2008). Prepared for DND under PWGSC Contract No. W8485-0-XKCF/01/BQ. Available on the Defence Wide Area Network at http://winnipeg.mil.ca/cfs/Automation%20Policy% 20Project/Automation_analysis_report%201.htm (accessed February 24, 2009).

6. In the summer of 2008, a United Airlines Boeing 777 conducted a rejected take-off in Zurich, Switzerland with a full load of passengers and fuel. United Airlines procedures state that only the aircraft captain will call "abort, abort, abort" after notification by a crewmember of a situation which might necessitate a rejected take-off. In this particular case, which occurred immediately prior to the reject take-off speed, the co-pilot called "abort, abort, abort." This caused a loss of situational awareness on the part of the aircraft captain as he struggled to comprehend the non-standard call-out from the co-pilot. As a result, there was a delay of over four seconds before the rejected take-off procedure was initiated by the crew, during which time the aircraft accelerated beyond safe reject speed for the remaining runway. In order to avoid departing the runway, aggressive braking and reversing action was required and resulted in a brake fire and damage to the aircraft. During the investigation, it was determined that the co-pilot had been with United Airlines for over 12 years and had received over 25 different training events in which United Airlines procedures had been taught and evaluated. When asked why he had called "abort, abort, abort" and caused a potentially catastrophic loss of situational awareness at a critical point in the take-off roll, he replied "Because that's the way we did it in the P-3 when I started flying with

the United States Navy." Chris Stickney, APPD Project briefing to the Directorate of Flight Safety Annual Seminar, Ottawa, Ontario, 31 October 2008.

7. Kobierski and Stickney, *Automation Analysis Report*, 3.3.

8. Kobierski and Stickney, *Automation Analysis Report*, 3.26.

9. Kobierski and Stickney, *Automation Analysis Report*, 3.26.

10. Mary K. Kaiser and Jeffrey A. Schroeder, "Flights of Fancy: The Art and Science of Flight Simulation," in *Principles and Practice of Aviation Psychology,* eds. Pamela S. Tang and Michael A. Vidulich (Mahwah, NJ: Lawrence Erlbaum Associates, 2003), 435–471.

11. As an example, the flap position indicator on the CC130H is a stand-alone instrument. On the C130J it is tied to over 25 different sub-systems, including the air data computer, the angle of attack system and the stall warning and protection system. Failure of the flap position indicator on a CC130H model is a straightforward and simple malfunction. On a C130J, its failure on the ground makes the aircraft unserviceable and in flight has the potential to be a complicated evolution with multiple and diverse systems failures and cockpit annunciations/warnings that, if not managed properly, have the potential to result in the loss of the aircraft and crew.

12. Federal Aviation Administration, *AC 120–35C: Line Operational Simulations: Line Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation* (Washington, D.C.: Flight Standards Division, 2004).

13. Kobierski and Stickney, *Automation Analysis Report,* 3.37.

14. Kobierski and Stickney, *Automation Analysis Report*, 5.11.

15. Marc Gerstein, *Flirting with Disaster: Why Accidents are Rarely Accidental* (New York: Sterling Publishing, 2008) 102.

16. Directorate of Flight Safety, *Flight Safety Investigation Report 1010–149914,* 44.

17. Ibid.

18. R. Key Dismukes, Benjamin A. Berman, and Loukia D. Loukopoulos, *The Limits of Expertise: Rethinking Pilot Error and the Causes of Airline Accidents* (Aldershot, England: Ashgate Publishing, 2007), 289–308.

19. Allan English, *Command and Control of Canadian Aerospace Forces: Conceptual Foundations* (Trenton, ON: Canadian Forces Aerospace Warfare Centre, 2008), 80.

20. David O'Hare, "Aeronautical Decision Making: Metaphors, Models, and Methods," in *Principles and Practice of Aviation Psychology,* eds. Pamela S. Tang and Michael A. Vidulich (Mahwah, NJ: Lawrence Erlbaum Associates, 2003), 228–230.

21. Federal Aviation Administration, *AC 120-54A: Advanced Qualification Program* (Washington, D.C.: Flight Standards Division, 2006), iii–iv.

22. Colonel Chris Shelly, "DFS Remarks," in *Flight Safety Investigation Report 1010-130311* (Ottawa: Directorate of Flight Safety, 7 September 2007), 21–22.

DIFFERENT SHADES OF BLUE:
INTERWAR
AIR POWER
DOCTRINE
DEVELOPMENT

PART 2
By **Major William March, CD, MA**

GERMANY AND JAPAN
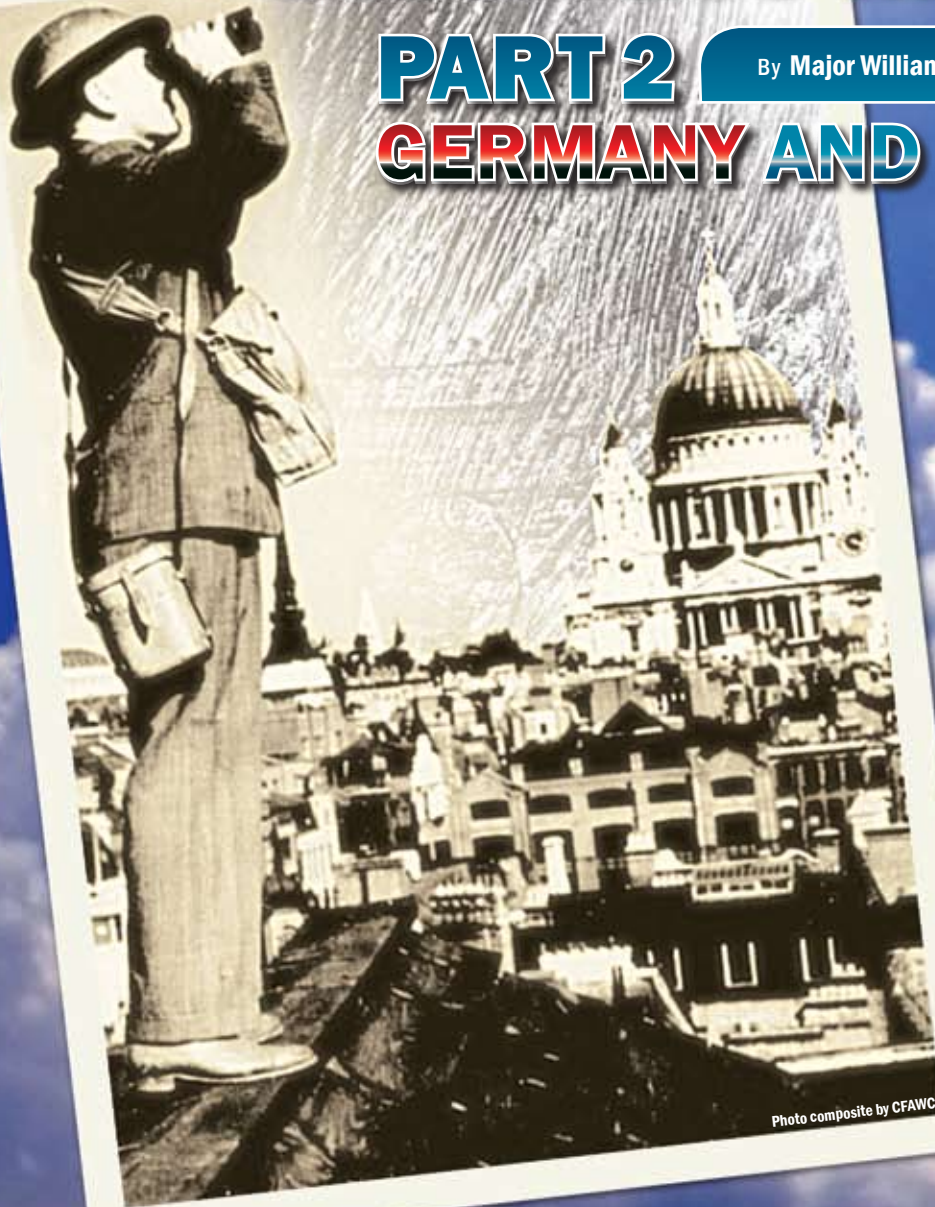
Introduction

This is the second in a series of two articles. Part I[1] examined the emergence of aerospace doctrine between the wars and the Anglo-American approach to its development. This part looks at the same issue from the perspective of the United States (US) and Britain's major aerospace opponents during the war: Germany and Japan.

The German Approach

Like England, Germany had ended World War I with a substantial body of air power experience across all possible roles and missions. In fact, German bombing missions against London led to the creation of the Royal Air Force (RAF). Although Germany, as a defeated nation, was denied an air force by the Treaty of Versailles, this did not stop the development of air power doctrine. Under the guidance of *Generaloberst* Hans von Seeckt, the commander of the much-reduced post-war army, Germany was the only major World War I combatant to undertake a systematic study of wartime aviation. They came to the conclusion that the first task for an air force would be to establish air superiority, after which missions in support of the army and against the enemy's rear areas could be flown. These missions were primarily offensive in nature thus making the bomber the most important type of aircraft.[2]

German army doctrine focused a combined-arms approach to combat in which a mix of infantry, artillery, tanks, cavalry and aircraft were applied to the mission at hand. To provide air power input a small air staff provided the theoretical work while practical considerations were explored at a secret base at Lipetsk in the Soviet Union. According to James Corum and Richard Muller, it was generally accepted that once Germany rearmed the *Luftwaffe* would be a separate service, while the air staff accepted as a matter of course that a large portion of the air force would be dedicated to supporting the army.[3] Therefore, unlike their Anglo-American counterparts there was no organizational pressure to create a doctrine simply to justify a separate air force. This permitted a wider appreciation of different air power roles.

Prior to the 1930s, the German air staff looked at two distinct missions. The first was ground support and the second was strategic bombing under the direction of higher command. A bomber-heavy force would be applied against targets, civil or military, that would have the largest impact on the conflict at hand. Both aspects were shaped by geographical considerations. Located in the heart of Europe and surrounded by potential enemies on all sides, Germany had to think in terms of ground warfare. Defeat on the ground, especially at the start of any conflict could very well cost Germany the war. Therefore, logic dictated that the military forces of the state, including the *Luftwaffe,* be directed to supporting the army. Williamson Murray noted that:

> …in the mid-1930s it would be of little benefit to the Reich to launch "strategic" bombing attacks against Paris, Warsaw or Prague at the same time the enemy ground forces seized the Rhineland, or Silesia. In the late 1930s, when Germany had more scope for offensive operations, Germany had to win the first land battles to gain the resources to sustain a long war. If Germany did not win those first battles, the war was irrevocably lost.[4]

The United States and Great Britain, behind the Atlantic Ocean and English Channel, respectively, could remain relatively secure behind a strong navy even if they were defeated on land.

These same geographical factors influenced the German outlook with respect to strategic bombing. Whereas Great Britain and the United States had to think in terms of long-range bombers, which normally

meant four-engine aircraft, Germany's traditional enemies were France, Poland and Czechoslovakia, countries well within the range of more affordable two-engine aircraft.[5] In addition to the geographic considerations there were industrial limitations on the type of aircraft that Germany could build. Four-engine heavy bombers demanded a level of industrial technology and available resources that Germany did not have throughout the 1930s. Therefore, for very valid reasons, the German "strategic" bombing force was made up of two-engine medium bombers.[6]

Generalmajor Walther Wever, the *Luftwaffe*'s first chief of staff, was responsible for writing a comprehensive doctrine for the German air force. Entitled *Conduct of Aerial Warfare*, or *Luftwaffe* Regulation 16, it would be issued in various editions up to the end of the war. Wever understood that the air force was part of a larger, national strategy. Regulation 16 noted that "the nature of the enemy, the time of the year, the structure of his land, the character of his people as well as one's own military capabilities would determine the employment of air power."[7] Wever's death in 1936 would be a severe blow to the *Luftwaffe*.

> "the nature of the enemy, the time of the year, the structure of his land, the character of his people as well as one's own military capabilities would determine the employment of air power."
>
> *Generalmajor* Walther Wever

Basically, the *Luftwaffe*'s approach to war would consist of three phases. During phase one the air force would concentrate on annihilating the enemy's air force. Phase two would be a period where the main focus of operations would be direct support to the army. Once the situation on the ground was deemed favourable phase three would commence. This final phase envisioned "deep interdiction" attacks against transportation, industrial and commercial centres. However, direct attacks against enemy populations in order to break "their will" were described as being "ineffective" and perhaps even "counterproductive."[8] With respect to strategic

bombing, German views tended to parallel the American vice the British approach.

Unlike their Western counterparts, however, the *Luftwaffe* had had the opportunity to test both their technology and doctrinal concepts during the Spanish Civil War. German air force participation was limited to the Condor Legion, an organization that never grew beyond approximately 1,000 personnel, but which deployed transport, fighter and bomber elements to Spain. The experience gained in this conflict confirmed the need for air power to support the ground forces and it also convinced the *Luftwaffe* that strategic bombing might not be as easy as its advocates had stated. Certainly, the practical requirements of locating and accurately striking targets from the air, as well as the "staying power" of civilian populations, had proven to be problems of significantly more stature than they had been led to believe.[9]

The *Luftwaffe* did not develop in a vacuum. Although its independence was never seriously questioned, the air force still had to contend with the army, navy and other state security institutions for scarce resources. Fortunately for the *Luftwaffe*, and as it turned out for the Allies too, their Commander in Chief was Hermann Göring who was the number-two man in the Nazi party. A staunch advocate of air power, Göring liked to emphasize "his" *Luftwaffe* as a decisive war-winning air force and he ensured that the air force received more than its fair share of scarce resources.[10] Therefore, from the top down, the *Luftwaffe* was conditioned to think in terms of a short war. Nevertheless, supply and resource issues would continue to plague the air force and, when coupled with the rapid expansion that the *Luftwaffe* experienced in the years leading up to the war, resulted in a somewhat uneven approach to ensuring sustainability in a long war.[11]

Perhaps the *Luftwaffe*'s greatest ally was none other than Adolf Hitler himself. He was most impressed with the potential "frightfulness" that air power introduced to the political dimension. Certainly, Hitler had capitalized on the West's fear of German air power during the Munich crisis and his annexation of the Sudetenland. As well, Murray cites Hitler's belief in the power of the German air force, which had served him so well in the past, as one of the critical factors that encouraged the German leader to go to war in 1939. As Hitler wrote at the time, "as air superiority is undoubtedly on our side, I do not shrink from solving the eastern question even at the risk of complications with the West."[12]

During the opening European campaigns of World War II, the *Luftwaffe* proved the efficacy of their doctrine. In Poland and the Low Countries, there was insufficient aerial opposition to deter the German air force from being able to support both strategic bombing and supporting the ground forces. In France, however, the opposition was such that the German air force was hard pressed to maintain aerial superiority and to provide the close air support that the army required and there were never enough resources to pursue anything

approaching a strategic campaign. Still, the short duration operations against Poland, the Low Countries and France were such that the inherent weaknesses in Germany's supply and resource availability were never a factor. This allowed the *Luftwaffe* to gain an air of "invincibility" that was not seriously challenged until their defeat during the Battle of Britain.

The dominant factor in the development of German air power doctrine was the need to pursue German goals on the international stage. Organizational and domestic political requirements, although present, were subjugated by the goals of the state. Even so, the *Luftwaffe* still followed the same basic path as that of the RAF and US Air Corps in that it was an independent air force that believed in strategic bombing. However, Germany's position in Europe meant that the *Luftwaffe* could not ignore the requirement to support the ground forces. Nor frankly, based on its historical and recent combat experience in Spain, was it likely to. The end result was "airpower [sic] theory [that was] comprehensive, practical, and well adapted to German strategy and technology."[13] It was a significant improvement on the doctrine followed by the United States and Great Britain.

Messerschmitt Bf 109E4 Serial Number 3579 built by Arado Flugzeugwerke G.m.b.H Werk Warnemunde in 1939. This flying example was on display at Willow Run airport, Ypsilanti, MI in August 2005.

The Japanese Approach

Japan chose a different path than either of her two primary antagonists and major European ally when it came to air power doctrine. Although James Trapier Lowe argued in *A Philosophy of Air Power* that "the strategic concept of military air power consisting of balanced air forces that could operate independently of ground and sea forces to achieve decisive results remained foreign to the Japanese until the end," the statement is short-sighted.[14] Furthermore, it reflects a post-World War II point of view heavily weighted with a belief that the US, British and, to a certain extent, German approach to air power was correct. However, the dominant form of air power was far from clear during the interwar period. In his work on the history of air power, Walter Boyne concluded that "Japan had created an able and indigenous aircraft industry, and was producing first-rate aircraft for both the Army and Navy. These aircraft were carefully tailored to their required mission, and while they did not meet the current European standards for armor [sic], self-sealing tanks, and firepower, they were well suited for the tasks expected of them."[15] This was an accomplishment that had more to do with a careful appreciation of air power from a Japanese perspective than it did from a misunderstanding of the "proper" approach to aviation and combat.

An island nation, Japan's security has always relied on its isolated geographical position and the relative weakness of her closest neighbours. The arrival in Tokyo Bay of United States Navy (USN) Commodore Matthew Calbraith Perry on 8 July 1853 added a complicating factor. Now that the "world" was aware of Japan, Japan needed to be aware of the world. Hereafter, to ensure the security of the Home Islands, the Japanese would require a strong navy. With an almost single-minded purpose, Japan pursued such a goal and by the turn of the century had created a modern navy almost from scratch. Then in quick succession two events occurred that made the Western world "sit up and take notice" of this growing eastern power. The first was the signing of the Anglo-Japanese Alliance in 1902 and the second was the victory of the Imperial Japanese Navy (IJN) over a Russian fleet at the Battle of Tsushima on 27 May 1905.[16] The end of World War I cemented Japan's position as a world power. An Allied "victor," Japan came away from the war with control of the former German possession in the Pacific and one of five permanent seats in the new League of Nations reserved for those nations with the largest navies.[17]

An overview of Japanese naval development is essential to understanding their approach to air power. Embracing the theory put forward by Mahan and demonstrated so successfully against the Russians, the IJN firmly believed that warships winning a climactic battle with the enemy fleet would win control of the sea.[18] The difficulty was that although Japan had embraced industrialization, it was still primarily an agrarian country and could not match the naval-building capacity of its two potential naval enemies: the US and Great Britain. The overriding aim of Japanese naval policy, which it pursued actively at the various naval limitation conferences that took place in the 1920s and 1930s, was to ensure that the ratio of tonnage for capital ships did not fall below 5:5:3 for the US, Britain and Japan, respectively. Tactical doctrine at the time was that a defending fleet needed to be at least 50 percent the size of the attacking fleet in order to ensure a proper defence.[19]

In 1923, the IJN designated the USN as its chief "hypothetical" enemy. The strategy they adopted to defeat the USN was entitled *ka omotte shō o sei-su*—using a few to conquer many. As the US fleet crossed the Pacific, the IJN would reduce the numbers of American ships through long-range attacks by submarines and cruisers. The much reduced American fleet would then be defeated by an IJN possessing superior technology and a firm belief that "the unique qualities of Japanese fighting spirit, willpower and moral superiority [would] make up for whatever quantitative inferiority limited its material."[20] By the mid-1930s air power had become an important part of this strategy.

A small number of Japanese officers had flown and fought with European nations during World War I. Among their reports was the opinion that "ships able to launch and retrieve wheeled aircraft would be an inevitable development in future naval warfare."[21] The utility of air power was demonstrated when two Japanese aircraft flown from a specialized handling vessel saw limited action during the IJN's campaign against German forces at Tsingtao, China. This limited experience spawned a crop of young theorists such as Engineer Lieutenant Isobe Tetsukichi who published a book entitled *War in the Air* where he predicted that "nations able to dominate the air would soon dominate the land and sea as well." More ominously, he also predicted that "Japanese cities would burn like matchwood under … aerial bombardment."[22] Still other theorists, such as Engineer Lieutenant Nakajima Chikuhei, wrote that air power would dominate future wars and render big-gun navies obsolete.[23] Like their Western counterparts, Japanese air power advocates were not about to let fact stand in the way of the point they were trying to make.

Assisted by Royal Navy advisors, and a gift of several aircraft made surplus by the end of the war, the IJN continued to experiment with aviation. Schools were established, and by 1925 the numbers of aviation related personnel had grown to permit the formation of a separate naval branch called the Imperial Japanese Navy Air Force (IJNAF).[24] During this period there was some discussion with the Imperial Japanese Army Air Force (IJAAF) about the possibility of forming an air service, but it never matured due to rivalries between the Imperial Japanese Army (IJA) and IJN. Unlike Britain and the US, there was no overarching air power theory—such as strategic bombing—under which to reach common ground. Although the Japanese were aware of the theories of Douhet, Mitchell and Trenchard, given their geographic position and the level of aviation technology, there was no way for the fledgling air forces to launch that type of campaign against potential enemies.[25] Nevertheless, the Japanese were cognizant of the potential damage that aerial bombardment could inflict on their cities and worked actively at disarmament conferences to have it banned as a method of warfare.

Still, air power advocates were working hard to make air power an important element of Japanese naval strategy. In essence, debate within the IJN centred on what would deliver the crushing blow to an enemy fleet during the decisive engagement—aircraft or big-guns. Throughout most of the 1920s, the big-gun traditionalists held sway. However, the launching of two fast fleet carriers, *Akagi* (1927) and the *Kaga* (1928), allowed the IJNAF for the first time to take part in major fleet manoeuvres. In fleet exercises, the carrier-based aircraft proved their worth through reconnaissance, gunfire spotting and "attacks" on enemy shipping.[26] What was needed now was a catalyst to move the IJNAF to the next stage. In this case, the catalyst was Admiral Yamamoto.

Yamamoto was a carrier naval officer with a keen intellect. He attended Harvard University in the US where he not only grew to appreciate

the enormous economic potential of this future adversary, he also became fascinated with aircraft and arranged for tours of American production facilities. It was at this point, according to his autobiographer John Deane Potter, that Yamamoto "had already decided that the key to future wars lay in air power."[27] Throughout the 1920s he held executive posts at the training schools and within the technical

directorates of the IJN. At the schools he established a reputation for intense aircrew training without regard to casualties; however, it was his work in the Technical Division of the Naval Aviation Department that had the greatest influence on Japanese air power.[28]

Until the early 1930s, the Japanese aviation industry was dependent upon foreign technology and expertise. Yamamoto went to great lengths to change this by supporting the creation of an indigenous industry that could build the type of aircraft the IJN required rather than pale comparisons of foreign models. Prior to 1927, Japanese naval aviation doctrine held that land-based aircraft of the IJNAF would conduct airborne attrition of the American fleet. When this approach proved to be somewhat ineffective and inflexible, attention turned to the possibility of equipping the new fleet carriers with suitable aircraft to accomplish this task. Yamamoto "pushed" Japanese industry to focus on producing small rugged fighter and attack aircraft that could operate from the restricted space on board a carrier. As well, a premium would be placed on being able to carry a larger payload over long distances—the farther away from the Home Islands the attacking fleet was engaged the better. As the international situation quickly began to deteriorate, these were the challenges that he set for aviation companies such as Mitsubishi and Aichi.[29]

Domestic politics in Japan was a deadly sport with assassination a common hazard. So-called secret patriotic societies believed it to be a service to the country to eliminate
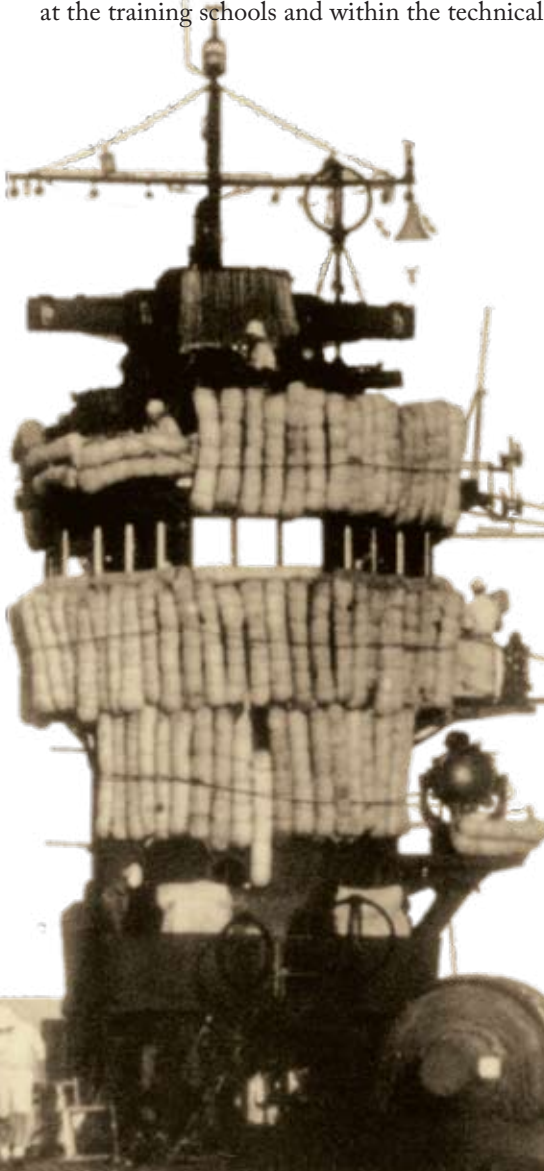
Aircraft carrier *Akagi* with B5N Kate torpedo bombers on her flight deck.

politicians and high-ranking officers deemed to be less than supportive of a stronger, expansionistic Japan. There was also a growing belief in the uniqueness of the Japanese character when compared with the West. This belief in the courage, resourcefulness and spiritual superiority of the Japanese, when coupled with a very real need for additional living space and raw resources, gave rise to the aggressive policies of the 1930s.[30]

The Japanese military had a long history of involvement in domestic politics. However, the military's domination of the apparatus of government during the decade prior to the war was done with "the full complicity of other elites."[31] Peter Duus summarizes this phenomenon as follows:

> Not all the concerns outlined above … were shared equally by all leaders in the 1930s and 1940s. But their convergence created a political context in which all demands for expansion reinforced rather than competed with one another, creating the basis for a broad coalition in favour of expansion. One has only to look at the major government decisions on foreign policy from 1936 onward to trace the ballooning accretion of expansionist goals, based less on an evaluation of what Japan was capable of doing than on what particular elements in the army, navy and bureaucracy wished to do. If there were dissenters in this process … it was those like … Isoroku Yamamoto, who did not disagree about the problems Japan faced but had a more realistic sense of Japan's limitations and the strengths of its potential opponents.[32]

Indeed, one of Yamamoto's promotions may have had more to do with saving his life rather than being a meritorious appointment.

Nevertheless, throughout the 1930s Japan would pursue a policy of territorial expansion primarily on the Chinese mainland. Commencing with the Manchurian incident in September 1931, Japanese forces would be in an almost constant state of conflict with either Chinese or Soviet forces and sometimes with both, and by 1937 the IJN and IJA found themselves in a full-scale undeclared war. Condemned for its belligerence, Japan withdrew from the League of Nations in March 1933 and for the next seven years attempted to diplomatically supplant the colonial powers as the dominant political force in the region. This culminated in the establishment of the Greater East Asia Co-Prosperity Sphere. In Europe as well, Japan sought additional allies and joined the Axis on 17 September 1940 with the Tripartite Pact. Western response to these activities had been a gradual reduction in the export of the critical resources, such as oil and steel, that Japan needed to function and to support its war efforts. After Japan signed the Tripartite Pact, the US completely banned oil exports and the international community quickly followed suit.[33]

The deteriorating international situation influenced a change in strategy by the IJN. Although it had ceased to be bound by naval building limitations in 1936, Japan realized that it could not match the building capacity of the US, let alone the US and Great Britain combined. The IJN decided instead to place a greater emphasis on carriers and reflected this change in ordering the construction of four additional fleet carriers and the manning of extra land-based units. The change in focus was underlined in the 1934 Fleet Instructions that emphasized the need to establish air superiority at any cost prior to a fleet engagement. Aircraft would then be used in conjunction with capital ships to win a decisive victory.[34]

Backed into a corner by the oil embargo, the IJN began to favour a southern strategy that would permit it to acquire the oil rich Dutch East Indies thus securing this vital commodity. Yamamoto, despite personal reservations against going to war with the US, now advocated making the maximum use possible of his carriers by attacking the American fleet in Pearl Harbor. He hoped that by destroying a substantial part of the American fleet, Japan

could take enough territory to provide a defensive ring around the Home Islands. He knew that Japan's only hope was to be able to win a short, decisive war and the hope for this outcome lay with carrier-based air power.[35]

Despite Yamamoto's best efforts, the Japanese aviation industry never achieved one hundred percent self-sufficiency and it never reached the mass-production standards of the US. To a large extent this inherent weakness was compounded by the ongoing competition, often bordering on open warfare, between the IJN and IJA over resources.[36] Although these activities were of serious concern at the time, they would become critical once war commenced. Nevertheless, Japan produced outstanding aircraft such as the G3M1 medium bomber, the performance of which was only surpassed by the prototype B-17; the Mitsubishi A6M Zero fighter; and the Nakajimi B5N2 Type 97 carrier torpedo bomber. These would be the aircraft that the IJNAF took to war and, reflecting naval aviation doctrine and lessons learned from combat over China, in almost all cases Japanese aircraft designers sacrificed protection for speed, range and agility.[37] However, when these aircraft were combined with well trained aircrew and superior ordnance, such as the Type 91 torpedo, then they were formidable weapons indeed.

Japanese naval doctrine called for small, light, rugged aircraft that could strike at the American fleet at as great a distance as possible. These qualities were put to the test against

G3M1 Model 21
G3M1 Model 22

A6M

Courtesy of www.warbirdphotographs.com   B5N2

determined opponents over mainland China from 1937 until 1941. Long-range strategic bombing of cities was commonplace and the IJNAF soon learned that unescorted bomber forces were "sitting ducks" for defending fighters. An attempt to undertake night bombing proved a dismal failure as it was beyond their capabilities to locate even the largest targets (cities) with any degree of accuracy. It was not until the Zero began to appear in large numbers to escort the bombers that losses began to approach acceptable levels.[38] Still, the IJNAF had demonstrated the superiority of their aircraft, training and tactics. Although the IJN would gain valuable combat experience, it was the ability to take this experience and apply it to naval operations that proved the most beneficial.

Under Yamamoto, the IJNAF developed an approach to naval combat that emphasized the combat experience hard won in China. Attacking from 200 miles away, an advance screen of fighters would establish air superiority over the target, while spare fighters would strafe the target, distracting and disrupting defensive elements. This attack would be followed by a combined assault from land-based bombers and carrier-based dive-bombers in coordination with torpedo attacks. With only a slight variation—the absence of torpedo bombers—these were the tactics that the IJN would follow when attacking shore targets.[39] The biggest difficulty was coordinating different groups of aircraft operating from widely-dispersed carriers, but that problem was solved when the IJN adopted a "box formation"

whereby up to four carriers would operate in a box approximately 7,000 square metres. Not only did this permit better cooperation, it also enhanced mutual defence.[40] Adopted in 1941, Yamamoto took it one step further and amalgamated his carriers with land-based naval aircraft into the First Air Fleet. This was the organization with which Japan went to war on 7 December 1941.

Air power development in Japan was radically different from that pursued by the Western nations in general and the US and Great Britain in particular. The combination of geography and aviation technology limitations in the 1920s made the pursuit of a strategic bombing doctrine problematic. As well, since inter-service rivalries and ties to the respective parent service removed any desire to form a separate air force, there was no organizational imperative to adopt strategic bombing as a rallying point. Domestic politics, although lively and somewhat dangerous, had an indirect effect on air power development, mainly through the advocacy of various international conflicts. However, domestic support for the IJN as the bastion of Home Island defence made it easier for the IJNAF to acquire the funding and support it needed to develop its approach to air power. The international security situation was the dominating factor in Japanese air power development and, like Germany, Japan developed an air force that best suited its requirements. The IJNAF demonstrated in China, and during the opening months of the war, that it was capable of a broad range of missions, from strategic bombing and attack to tactical level operations against maritime and land targets. In effect, it demonstrated that the effective application of air power did not require a focus on strategic bombing nor an independent air force.

Conclusion

It is interesting to note that Anglo-American air power development was dominated by a need to ensure either organizational survival or, in the case of the Air Corps, organizational birth. This quest for independence led air power development in these two nations to develop an overly focused pursuit of strategic bombing. The belief in the bomber and its ability to be decisive, led to a remarkable stagnation in doctrinal thought to the point where contrary evidence was ignored. Perhaps stranger was the apparent desire prior to the war by the institutions to limit efforts to improve strategic bombing capability lest it cast doubt on the efficacy of the entire concept. Perhaps basing doctrine on organizational imperatives is not the best way to proceed.

Conversely, both German and Japanese air power development was guided by international goals, albeit expansionist ones. In both cases, air power was more fully integrated into the overall state power apparatus, although that structure proved extremely dysfunctional in the case of Japan. The relatively poor choice in examples aside, air power development in these two Axis countries seemed to indicate that doctrine based on state goals is broader and more effective.

Unfortunately, victors get to write the history of wars, and air power victors get to write doctrine. Doctrine is a useful tool to ensure organizational survival—especially during times of peace and inter-service rivalry. Therefore, it is unavoidable that a large portion of future air power scholars will continue to focus on air power doctrine that defines a special air power role that only an independent air force can accomplish. Other avenues of approach, such as the IJNAF, will escape serious study except as examples of "what not to do." ■

List of Abbreviations

IJA	Imperial Japanese Army
IJAAF	Imperial Japanese Army Air Force
IJN	Imperial Japanese Navy
IJNAF	Imperial Japanese Navy Air Force
RAF	Royal Air Force
US	United States
USN	United States Navy

Major William (Bill) March, originally from Cornwall, Ontario, joined the Canadian Forces in 1977 under the Regular Officer Training Program. Graduating from the Royal Military College in 1982, he underwent basic navigation training in Winnipeg, and then proceeded on to CP140 Auroras, serving on 407 Maritime Patrol and 404 Maritime Patrol and Training Squadrons. Posted to Royal Roads Military College in 1990 as a squadron commander, he was promoted the next year and assumed military training and administrative duties for the College. In 1993, he completed his Master's Degree at the University of Victoria and was selected to recreate the position of Air Force Historian at 1 Canadian Air Division Headquarters for which he earned a Chief of the Air Staff Commendation. After Staff College in 1998, he filled a series of staff appointments at National Defence Headquarters which culminated in working on unmanned air vehicles (UAVs) and intelligence, surveillance and reconnaissance (ISR) for the Air Force. In 1999, his work in promoting aviation history in Canada was recognized when he was presented with the Fred Hatch Award. Posted overseas in 2003, he worked as the principal Desk Officer for the North Atlantic Treaty Organization Response Force activities of the Land Component Command Headquarters, Heidelberg, Germany. Returning to Canada in 2006, he spent two years as the Concepts and Doctrine Development desk officer for UAVs and Space at the Canadian Forces Aerospace Warfare Centre in Trenton, Ontario. Although he is still involved with UAVs, his "day job" is that of the Academic Liaison Officer within the Strategic Aerospace Research, Assessment and Liaison Branch. To make the most of his spare time, in September 2006, he commenced studies towards a PhD in War Studies at the Royal Military College. Major March has a long-time interest in aerospace history in general and Canadian Air Force history in particular.

NOTES

1. W. A. March, "Different Shades of Blue: Interwar Air Power Doctrine Development - Part I: Air Power, Doctrine and the Anglo-American Approach," *The Canadian Air Force Journal* 2, no. 1 (Winter 2009), 16-27. Available at http://www.airforce.forces.gc.ca/CFAWC/eLibrary/Journal/Current_Issue_e.asp (accessed February 9, 2009).

2. James S. Corum and Richard R. Muller, *The Luftwaffe's Way of War: German Air Force Doctrine, 1911-1945* (Baltimore: The Nautical and Aviation Publishing Company of America, 1998), 6-7.

3. Ibid., 7-8.

4. Williamson Murray, *German Military Effectiveness* (Baltimore: Nautical and Aviation Publishing Company of America, 1992), 48.

5. Corum and Muller, 8.

6. James Corum, "Airpower Thought in Continental Europe Between the Wars," in *The Paths of Heaven: The Evolution of Airpower Theory*, ed. Phillip S. Meilinger (Maxwell: Air University Press, 1997), 173.

7. Murray, *German Military Effectiveness*, 43.

8. Corum and Muller, 10.

9. Murray, *German Military Effectiveness*, 25.

10. Ibid., 45.

11. Williamson Murray, *Strategy For Defeat, The Luftwaffe 1933-1945* (Maxwell: Air University Press, 1983), 1-3. This is an excellent summary of the economic difficulties facing

Germany prior to the war. Murray also notes that in 1933, the *Luftwaffe* had 1,100 officers and 17,000 men, but less than seven years later it had expanded to 15,000 officers and 370,000 men which put an enormous strain on training and supply. Murray, *Strategy For Defeat*, 6-7.

12. Murray, *German Military Effectiveness*, 45.

13. Corum, "Airpower Thought in Continental Europe Between the Wars," 175.

14. James Trapier Lowe, *A Philosophy of Air Power* (Lanham, MD: University Press of America, 1984), 250.

15. Walter J. Boyne, *The Influence of Air Power Upon History* (New York: Pelican Publishing, 2003), 166.

16. For an overview of the Anglo-Japanese Alliance see Robert Massie, *Dreadnought: Britain, Germany and the Coming of the Great War* (New York: Random House, 1991), 339-341. For a discussion of the Japanese role in the Battle of Tsushima see Stephen Howarth, *Morning Glory: The Story of the Imperial Japanese Navy* (London: Arrow Books, 1985), 89-96.

17. Howarth, 141. The former German possessions included islands in the Marshall, Carolina and Mariana groups. This territory provided Japan with a "barrier" between the US and the Philippines.

18. A.T. Mahan, *Naval Strategy* (London: Sampson, Low, Marston & Co., 1911), 199. Japan was no stranger to Mahan—for an overview of his influence see Roger Dingman, "Japan and Mahan" (paper presented at the Mahan Centennial Conference, Naval War College, Annapolis, Maryland, April 29 – May 1 1990).

19. Military History Section, Headquarters Army Force Far East, Monograph 160, "Outline of Naval Armament and Preparations for War, Part III," *War in Asia and the Pacific, Vol. 4: The Naval Armament Program and Naval Operations (Part 3)* compiled by Donald S. Detwiler (New York: Garland Publishing, 1980), 4.

20. Mark Peattie and David Evans, *Kaigan: Strategy, Tactics and Technology of the Imperial Japanese Navy, 1887-1941* (Annapolis: Naval Institute Press, 1997), 212.

21. Mark Peattie, *Sunburst: The Rise of Japanese Naval Air Power, 1909-1941* (Annapolis: Naval Institute Press, 2001), 6.

22. Ibid., 11.

23. Ibid., 11-12.

24. Alvin Coox, "The Rise and Fall of the Imperial Japanese Air Forces," in *Air Power and Warfare*, ed. Alfred Hurley and Robert Ehrhart (Washington: Government Printing Officer, 1979), 86.

25. Lowe, 119-110.

26. Peattie and Evans, *Kaigan*, 248.

27. John Deane Potter, *Admiral of the Pacific: The Life of Yamamoto* (London: Cox and Wyman, 1965), 17-18.

28. Ibid., 20.

29. Peattie and Evans, *Kaigan*, 303.

30. Ben-Ami Shillony, *Politics and Culture in Wartime Japan* (Oxford: Clarendon Press, 1981), 134.

31.   Peter Duus, "Japan's Wartime Empire: Problems and Issues," introduction to *The Japanese Wartime Empire, 1931–1945*, ed. Peter Duus, Ramon H. Myers and Mark Peattie (Princeton: Princeton University Press, 1996), xiv.

32.   Ibid., xvii.

33.   Peattie and Evans, *Kaigan*, 455-456.

34.   Ibid., 250.

35.   Ibid., 453-456 and 473-475.

36.   Coox, 93.

37.   Peatie, *Sunburst*, 86-89.

38.   Ibid., 116-125.

39.   Ibid., 146.

40.   Ibid., 148-149.

Focke-Wulf Fw 190

Multinational Interoperability Council and Coalition Building

By Colonel William Lewis, OMM, CD, M Eng, M Ed, MBA, MDS, PhD

MIC

MULTINATONAL INTEROPERABILITY COUNCIL

STRONGER COALITIONS • ENHANCED OPERATIONS

INTRODUCTION

Since the cold war concluded in the early 1990s, multinational/coalition operations have shaped the military's involvement in activities and engagements around the globe. These military involvements cover the full spectrum of operations, from humanitarian/disaster relief, to peacekeeping/peace enforcement, to major theatre war. The most important variable in coalition operations is "unified action," the synergistic application of all instruments of national and multinational power involving non-military and international organizations, governmental as well as military forces. In order to achieve unified action, interoperability between multinational forces is characterized by the seamless exchange and sharing of information at the strategic, operational and tactical levels. Interoperability means more than simply connecting systems together to exchange data, but also involves "the ability of coalition partners to share information, create a shared understanding of the situation, collaborate on the development and selection of courses of action, communicate these to all forces or units, and allow forces to work together effectively."[1] Aside from communication and information technology networks, interoperability includes all aspects of doctrine, logistics, intelligence and policy. When assessing the current state of multinational interoperability, it is easy to identify gaps, which hinder strategic and operational planning between national military and planning staffs. The realization that these gaps exist was a key factor in forming the Multinational Interoperability Council (MIC), a deliberative, non-binding multinational forum.

THE MULTINATIONAL INTEROPERABILITY COUNCIL

MIC is a senior operator-led, seven-nation forum that identifies and addresses strategic and high-level operational interoperability issues, challenges and gaps. This forum has existed since 1996 and consists of representatives from the Ministries/Departments of Defence of Australia, Canada, France, Germany, Italy, the United Kingdom and the United States.

MIC identifies interoperability issues and articulates actions which, if nationally implemented by member nations, contribute to more effective multinational/coalition operations.[2] Its overall goal is to facilitate the exchange of relevant information across national boundaries to support multinational/coalition operations and to encourage national actions to resolve interoperability issues. Its vision is to become a premier, operator-led forum that promotes interoperability among lead nations' militaries and is supported by collaboration with and between government and relevant non-government entities, thus enabling more effective and successful multinational/coalition operations.[3] MIC is an excellent collaborative forum for senior operators and their staffs to candidly and objectively discuss the multitude of interoperability issues that face their nations—individually and collectively—in supporting multinational/coalition operations.

Membership in MIC is selective but not exclusive. To be a MIC member, a nation must have the desire, capability, competence and resources to lead a coalition operation and be willing to commit sufficient personnel and resources to fully participate in all MIC meetings. The small number of member nations allows MIC to adroitly balance the benefits of broader perspective and regional coverage while still being responsive and flexible. Nations not meeting MIC's membership requirements can petition for "observer" status and participate in MIC meetings, while organizations can petition for "associate" status. Currently, New Zealand is an observer while the North Atlantic Treaty Organization's (NATO's) Allied Command Transformation and the European Union's Military Staff are associates in MIC.

MIC is led by senior flag or general officers from either the operations or plans branches of each member nation's defence staff who are designated as the "MIC Principals". The US Joint Staff Director of Operations (J3) acts as the Chairman of MIC. The MIC Principals meet annually, or more frequently, if needed, to provide oversight and leadership in managing, responding to and approving MIC's work. This work is performed by the functional and Capstone Multinational Interoperability Working Groups (MIWGs), which review and assess issues related to coalition interoperability, identify solutions and prepare prioritized recommendations for approval by the MIC Principals.

There are six functional MIWGs with members from each of the MIC nation's national staffs who are O-5/O-6 (NATO OF-4/OF-5) level military officers or their civilian equivalent. The functional MIWGs are: Communications & Information Systems (CIS), Concept Development & Experimentation (CD&E), Logistics, Medical, Operations, and Policy & Doctrine (P&D). The MIWGs meet every six months for five days to conduct their business activities.

The Capstone MIWG is composed of the senior O-6 representatives from each MIC member nation. They execute tasks assigned by the MIC Principals and serve as the senior oversight group for MIC during MIWG meetings. The US Joint Staff Deputy Director for Global Operations / Multinational Operations Division Chief serves as the Capstone MIWG Chairman. This officer also serves as the senior member of the MIC Executive Secretariat (ES) staff which, in addition to managing MIC's day to day business, coordinates and communicates with other multinational organizations and MIC national / MIWG appointed representatives.

The MIC Principals and other national representatives to MIC and the MIWGs express their nation's coordinated national positions on multinational/coalition issues to the extent practical, in accordance with their national laws. Formal approval and implementation of measures agreed to and endorsed by MIC are the responsibility of the member nations and their national staffs.

THE COALITION OPERATING ENVIRONMENT

The overarching context for MIC's work is based upon an understanding of the nature and environment of operations involving multinational and coalition operations. Multinational and coalition operations are diverse entities, where members have divergent national interests, modi operandi and equipment. Despite these complexities, multinational and coalition operations are increasingly relevant for international military intervention operations.

The diversity of a coalition strengthens an operation in terms of international legitimacy, sharing the equipment/manpower burden, political/diplomatic advice and national economic resources. The assets brought to a coalition operation by diverse nations provide a range of resources, skills and experience that enhance the chance of success while concurrently demonstrating buy-in and commitment from the international community.

The benefits of multinational diversity are counterbalanced by its difficulties, which include differences in language, equipment, understanding, goals, rules of engagement, national interests, technology, foreign disclosure policies and budgets. Though the nations may want to share information, national policies may prevent them from doing so, particularly when dealing with intelligence information.

MIC PRODUCTS

MIC has completed a variety of products to assist national staffs or coalition task force staffs in building coalitions that are more effective.[4]

MIC published the *Future Coalition Operating Environment* (FCOE) document, which provides a shared vision of the future multinational/coalition environment nations are likely to operate in. The future envisioned in the FCOE document supports the activities associated with the guiding strategic- and operational-level interoperability development. The document identifies the key functions and capabilities that will likely be required to operate effectively within a future coalition.

The *Rapid Reconnaissance Handbook for Humanitarian/Disaster Response* document is a compilation of best practices on humanitarian/disaster reconnaissance fundamentals, methods, approaches, teams, planning, information management and lessons learned. It serves both as a strategic and a high-level operational reference tool for contingency reconnaissance planning in the event of, or as a result of, a humanitarian or disaster situation.

The *Coalition Building Guide* (CBG) addresses the coalition building process with respect to military operations. The CBG introduces the "lead nation" concept, defined as the nation selected by mutual consent of the participating nations in a multinational effort to lead the coalition in operations. The CBG specifically identifies the essential factors that the lead nation's coalition commander and staff should consider for the effectiveness and efficiency of a coalition.

COMPREHENSIVE APPROACH: A WAY AHEAD FOR MULTINATIONAL INTEROPERABILITY

The majority of intervention operations for the foreseeable future are likely to involve coalitions where nations share the burdens and resources of supporting an operation, while at the same time providing legitimacy for the operation. These benefits, however, are offset by the complex nature of coalitions. MIC

nations working together have the opportunity to address and resolve these complexities, or at least reduce their impact, while maximizing the benefits of coalition operations. MIC nations understand that forming, building, executing and sustaining future coalition operations is only going to become more complex as resources become more limited and dynamic security threats continue to evolve around the globe.

One significant aspect of coalition/multinational operations that MIC has begun to address is the comprehensive approach (CA). Recent operational experiences have indicated that military actions alone cannot resolve a crisis and that close cooperation and interaction between all actors within an area of interest is necessary. Since many of these actors act independently with no hierarchical relationships with other actors, a set of comprehensive procedures is needed to facilitate effective and efficient cooperation between all actors.

This comprehensive approach to operations, the collaboration of military and non-military forces and organizations in crisis management, is currently being discussed in a wide variety of national, international and supranational organizations and fora. However, due to the large number of actors, each focusing on different, partly incompatible objectives, neither an internationally agreed conceptual basis, nor an established set of terms and definitions is yet available. Promising developments in the MIC nations and some of the NATO and European Union nations are all aiming in similar directions. MIC intends to capitalize on these existing efforts by focusing on the military contributions to CA and by examining the friction points between military forces and all other actors in crisis management operations. Eventually, MIC hopes to use this analysis to create new CA products that will be useful to strategic and operational planners in preparing for and executing coalition/multinational operations using the CA across the wide spectrum of crisis management scenarios.

The bridging of doctrine, communications, logistics and planning—coupled with a full understanding of each potential partner's capabilities and limitations—will enhance the success of future coalition operations and promote a safer world environment. To this end, MIC's main work efforts for 2009 are focused on the following areas:

- The CIS MIWG is continuing the development and implementation of a secure MIC wide area network that facilitates the sharing of classified information between MIC member nations.

- The CD&E MIWG is developing a common CA framework that establishes a common understanding of CA.

- The Logistics MIWG is finalizing and publishing bilateral mutual logistics support agreements between MIC nations that allow nations to support one another logistically during coalition operations.

- The Medical MIWG is finalizing and publishing bilateral mutual medical support agreements amongst the MIC nations that will allow nations to share medical support and resources as needed.

- The Operations MIWG, under the CA umbrella, is investigating the integration

of post-conflict activities into a "best practices" stabilization handbook.

- The P&D MIWG is exploring the requirements, strategies and procedures to transition from a coalition end state under military control to a "follow-on" civilian authority (United Nations, host nation, etc.).

MIC is working diligently on interoperability issues to ensure future coalitions are stronger and more effective. MIC's efforts are assisting potential coalition lead nations in working more effectively together before, during and after a crisis.

For more information about MIC, navigate to http://jcs.dtic.mil/j3/mic/ ∎

List of Abbreviations

CA	comprehensive approach
CBG	Coalition Building Guide
CD&E	Concept Development & Experimentation
CIS	Communications & Information Systems
ES	Executive Secretariat
FCOE	Future Coalition Operating Environment
MIC	Multinational Interoperability Council
MIWG	Multinational Interoperability Working Groups
NATO	North Atlantic Treaty Organization
P&D	Policy & Doctrine

In addition to his primary duties as the Director of Coordination in the Strategic Joint Staff, Colonel William Lewis is an Adjunct Professor at both the Royal Military College of Canada and Loyalist College as well as the Canadian Capstone member of the Multinational Interoperability Council.

NOTES

1. *Coalition Military Operations: The Way Ahead Through Cooperability* (Arlington, VA: U.S.-Center for Research and Education on Strategy and Technology, 2000), 30. Available online at http://www.uscrest.org/CMOfinalReport.pdf (accessed February 25, 2009).

2. *Charter of the Multinational Interoperability Council* (Washington: Multinational Interoperability Council, 2008). To request a copy, contact the MIC ES at mic.es@js.pentagon.mil.

3. *Strategic Guidance Document* (Washington: Multinational Interoperability Council, 2008). To request a copy, contact the MIC ES at mic.es@js.pentagon.mil.

4. Information on these MIC documents as well as other MIC products is available at http://jcs.dtic.mil/j3/mic/doc.html (accessed February 25, 2009).

By Major-General Marc Terreau, CMM, CD (Retired)

REFLECTIONS AND QUESTIONS ON

ETHICS

INTRODUCTION

Ethics and integrity are not just fads, as some cynics would say. Humans have been debating virtuous behaviour and working for the good for at least 2500 years.[1] Yet, we are often falling short of the good. Why is that?

Over the years I have dealt with leaders, great and poor, and observed ethical dilemmas played out in various settings. My observations have been primarily in the public sector including the Armed Forces as well as in the not-for-profit sector where I have worked with numerous organizations. I have also had the opportunity to work with certified fraud examiners in both the private and public sectors. This paper is not necessarily the summa of my journey in the field of applied ethics; rather it is a series of observations that have impacted my perception on how to do the right thing and do things right.

In my involvement with organizations such as the Ethics Practitioners' Association of Canada[2] and in establishing a formal ethics program in the Department of National Defence and the Canadian Armed Forces, I have faced a number of important questions. Regrettably, I have not always found suitable and useful answers to these questions. One can only do the best possible with what is available at the time.

It is therefore my aim in this short paper to share some of my observations and questions with the reader in order to stimulate thinking and dialogue on relevant issues of applied ethics. It is my hope that in the ensuing discourse, useful and useable suggestions will come to the fore, thereby assisting those who are focused on improving workplace atmosphere and ethical performance.

In collecting various perspectives, I have drawn on a multitude of sources. Over the years, I have attended numerous conferences on ethics and on leadership as well as participated in discussions at events held by organizations such as:

- The Ethics Practitioners' Association of Canada – L'Association des praticiens en éthique du Canada

- The Canadian Defence Academy / Royal Military College / Canadian Forces Leadership Institute

- The Association for Practical and Professional Ethics (US)

- The Conference Board of Canada

- The Ottawa Round Table on Ethics

BACKGROUND

Humans have been talking about ethics for a long time, yet I am not sure that there is one acceptable definition of ethics. It appears to me that "ethics" and "ethical behaviour" mean different things to different folks. Nevertheless, for the purpose of this paper I have opted for the following definition of ethics: "It is an intellectual process to help us find the best way to live up to our core values and most often to our shared values in our social/cultural surroundings." Ethics is a personal and collective responsibility that calls for leadership, judgement and dialogue.

In my view, ethics is using personal and shared values to do the right thing and is a commitment to doing the right thing. Ethics is what you aspire to do. To simplify it to an extreme, ethics is often described as what you do when no one is watching. Here is a simple formulation that I have used in presentations:

ETHICS stands for:

E	for *everyone* – Would you want everyone to do what you are doing? Everyone is responsible for ethical performance..
T	for *tradition* – Are your actions in line with the expectations, norms, values and customs of society?
H	for *humiliation* – What would your family, friends, neighbours think if you had an ethical lapse?
I	for *illegal* – If the police found out, would you be charged?
C	for *consequence* – Will your actions result in a good outcome?
S	for *situation* – What circumstance requires extraordinary action?

The difficulty appears when you try to put these concepts into practice. Two differing schools underpin different types of organizational ethics programs. One is compliance-based while the other is values-based. Let me paraphrase from a Department of National Defence paper on the fundamentals of Canadian Defence Ethics. Compliance is rule-based. Individuals are asked to simply obey the law and the rules. It is a legalistic approach and minimizes the decision-making process. Such a system does not promote positive ethical attitude and behaviour. Values-based ethics is more inspirational. It states in general terms what is desirable and allows some latitude in application. People must use their judgement based on their shared values.[3]

The debate on compliance- versus values-based approach to applied ethics has led nowhere so far because what is really needed is a balanced approach. After all, the legal requirement (obeying the law) is only the mandatory minimum standard. To be a good citizen demands much more than just obeying the law.[4] We need to seek a much higher standard. A friend of mine often says that the law is what you have to do while ethics is what you ought to do.

Nan DeMars[5] outlines the six levels of moral development that Lawrence Kohlberg wrote about in 1961. They include obedience to powerful authority, looking out for number one, meeting the expectations of the group, preserving the social order, adopting free arguments and social contracts as well as universal ethical principles.

The President of the Ethics Resource Center in Washington, DC recently wrote inter alia: "Not that we needed it, but Wall Street has handed us its latest lesson in the importance of ethics programs and what happens when they are ignored. … Making regulatory and legislative walls higher probably won't hurt. But neither should anyone assume that staking laws upon laws makes for impregnable defenses. Rogue traders – and mortgage lenders and even some CEOs – will find a way. Remember, Enron [sic] had rules and a picture perfect code of conduct. … The lesson here is not that crime does not pay, but that organizations have to rely on trust, as well as rules, to safeguard their businesses, customers and stockholders. You

set rules for your teenager, but you trust them [sic] with the car keys."[6]

When speaking of values-based ethics programs, one needs to clearly define what values are. Here again, we find a number of definitions but I tend to use the one adopted by the Public Service of Canada. "Values are enduring beliefs that influence attitudes, actions and the choices and decisions we make."[7] However, like laws and rules, values evolve over time.

In 1995, the UK Nolan Committee outlined the qualities expected from all holders of public office: selflessness (pursue the public interest, not gain for self, family or friends), integrity, objectivity, accountability, openness, honesty and leadership.[8]

Donald Savoie[9] in his seminal book *Court Government and the Collapse of Accountability*, published in 2008, makes a number of observations that are relevant to these issues and have greatly influenced my perspective on applied ethics.

During an EthicsCentre.ca presentation on codes of conduct in the private sector in October 2008, Dr. Mark Baetz was quoted on specific values. Baetz focuses on six fundamental values that underpin ethical behaviour. They are: trustworthiness, respect, responsibility, fairness, caring and citizenship.[10] The positive position of ethics in the profession of arms in Canada is that the Department of National Defence and the Canadian Armed Forces have a "Defence Ethics Program" that is well established, comprehensive and sustainable. The Defence Ethics Program lists six core defence ethical obligations: integrity, loyalty, courage, honesty, fairness and responsibility.

Over time, I have observed ethics in practical terms and reflected on its impact from different perspectives.

Social Contract

I found a short anonymous text on the unwritten social contract that exists between an individual and society (or system). By society I mean everything from family through the workplace to a nation as a whole. The two perceptions of needs (or wants) are outlined in Table 1.

Individual Wants	System Needs
Fair compensation and benefits	Productivity (efficiency)
Chance to learn and grow	Cost effectiveness (economy)
Meaningful work	Loyalty (concentration)
Compatible people (shared values)	Innovation (forward looking)
Boss I can respect (trust)	Teamwork (trust)
Reasonable security	Flexibility

Table 1: Unwritten Social Contract

These two groupings can appear to be challenging each other. However, it is possible to balance them such that there is value from both perspectives. The major difficulty arises when they become seriously out of balance, leading to clashes where no one wins.

In a military context there is more to the social contract mentioned above. It is the concept of unlimited liability that makes a world of difference.[11] If individuals voluntarily commit to defend the nation's national security at all costs, there is a need to ensure that they and their families receive the support that they justifiably deserve. This would include ethical and effective leadership, fair compensation and full comprehensive support in case of injury or death. The book *Duty with Honour: The Profession of Arms in Canada*, published by the Canadian Forces Leadership Institute, is very instructive in the matter.[12]

Morality

There remains in each individual a sense of morality—of what is right and what is wrong. This sense of morality has a religious context, a family and social context and even an organizational context that can be explored in depth. A study of morality in diverse groupings may lead to establishing the fundamental values that are shared by all humanity.[13] These can be useful when attempting to establish an ethical basis for dialogue in a multicultural environment.

Individuals

In my work in applied ethics and working with fraud examiners, I have often heard that any human grouping follows a bell curve. At one end, 5 to 10 percent of the people are pure of spirit and action. If they were to stumble on a room full of money, they would quickly lock the door and run to security to report it. At the other end of the curve there is a similar percentage of people who would do anything to get to the money and abscond with it. Between these two extremes are the rest of us. Most individuals are loyal, dedicated and hard working but may need occasional reminders of what is expected. These good people need to be reminded to stay focused on the task at hand and to avoid an ethical accident where individuals as well as organizations may see their reputations damaged and suffer the consequences.

In the military, as in many other groupings, it is the behaviour of the leader that sets the tone. Great military leaders set an example that most want to follow in order to excel. That is not to say that all military leaders are perfect, some use questionable techniques to obtain results. In the main it is what you do that counts and not necessarily what you say.[14]

Integrity

Many use the word integrity in the same sense as ethics. Ethics is a philosophy or way of thinking while integrity is a virtue or quality that an individual possesses, or not.

I am inclined to use "ethics and integrity" as a dual approach to doing the right thing and doing things right. In my view, integrity in a person means that you get the total package; the whole person, who is trustworthy, has strong values that are in constant action and is consistent in their actions and utterances. Some of the values that one expects from such a person include the ability to speak truth to power. Having integrity also implies that the person can be reasonably expected to do what they said, finish the task that the person has initiated, maintain commitments made to others and be accountable. That individual is considered an ethical leader because they actually "walk the talk." Integrity, therefore, means being a whole person who is trustworthy and transparent.[15]

Workplaces

Organizations seek to have an environment including a decision-making process that will minimize errors and obtain the best performance out of individuals. In that way, the reputation of the organization will be preserved, if not enhanced; trust will be ensconced throughout; and the corporate and social goals will be met. How that is accomplished makes a world of difference to the workplace atmosphere and performance.

The nature and scope of an ethics program determines how this will be done and what success will accrue. However, no ethics program will be successful if the tone-at-the-top is neutral or negative. It is a question of ethical leadership that is missed by many through indifference or lack of understanding of what makes an organization the best in its field.

Ultimately, it is the judgement of our ethical efforts by others that determines our trustworthiness. Ethics is doing the right thing while good management is doing things right.

QUESTIONS

The fundamental question that will emerge in the remainder of this paper is,

"why, with all our knowledge of ethics do we still have recurring ethical lapses?" We are, after all, human but might we do better? I have elected to open four windows into our communal behaviours.

Workplace Observations and Questions

My observations below are focused on garrisons (i.e., a relatively stable environment), not in the field of human conflict or operational stressful environment where there is little time for decision making. As I observe individuals in these garrison workplace environments, I note that they have tight timelines that must be dealt with. The issues that they are faced with are often laced with ethical dilemmas, not the major kind perhaps but stressful nevertheless. I also note that the pressures are not relieved with the data at hand. In fact, they appear to suffer from data overload (Blackberry ringing, cell phone vibrating, pager going off and dozens of irrelevant emails). The sum of all this is that they have precious little time to focus on the task at hand and the consequences of their decisions and their acts.

Yet, in a military context, decisions made in garrison (base or headquarters) can have life and death impact in military operations. Thus the importance of always keeping focused on what the task is all about.

Savoie mentions that the 2004 Office of the Auditor General Report highlighted "six root causes of management problems in government: losing sight of fundamental principles; pressures to get the job done that compromises program integrity; failure to intervene to correct or prevent problems; a lack of consequences for inadequate management; a lack of organizational capacity to deal with risk; and unclear accountability."[16]

When pressed for time and overwhelmed with data in a poisoned workplace atmosphere due to poor leadership or lack of defined shared values, individuals often reach for the goal without adequate ethical analysis and find themselves in trouble. The aim does not justify the means employed in many cases, and a disregard for our shared values has resulted in failure to reach the mid- to long-term goals of the organization. When the boss says: "I don't care how you do it, just get it done," it is time for a very careful analysis of what is at hand.

Most of my focus has been on the workplace and its atmosphere. This is largely due to the number of times that I have met individuals who were working in a poisoned environment. When discovering issues of abuse, misuse, fraud or worse I have discovered that inevitably the workplace had a terrible atmosphere.

When a problem is observed, what is an organization member's obligation to act? Is there really a risk to your livelihood if you report potential wrongdoing? We know what the law demands but what do our values say to us? These are terribly difficult questions to answer in the reality of the workplace. They are useful in starting a meaningful dialogue on ethics.[17]

I have observed that in some very large organizations mixed messages are being sent. The recruiting system is aimed at attracting and hiring good people. The system is looking for people who understand and live virtue ethics. However, having hired them we place them in a compliance-oriented workplace. We incessantly tell them to use their judgement but the actions of the leadership of the organization clearly imply that errors are not tolerated. There is an active blame game going on. When you have a compliance environment where you seek absolute flawless behaviour from individuals coupled with very harsh sanctions, you end up with very scared and timid members where many either break or leave.

Savoie makes two observations that are relevant: "Civil servants who have learned the art of lying low and not drawing attention to themselves or to their units from either the media or politicians will survive and flourish."[18] "It is not too much of an exaggeration to suggest that accountability in government is now about avoiding mistakes, even the most trivial ones, so as not to embarrass the minister and the department."[19]

My fundamental questions are: Why do we still have to raise these issues? Why is it so difficult to deal with them? Is this a human nature issue, a cultural issue or a moral issue? For example, media forms public opinions that, in turn, form the basis of popular pressure on politicians, yet maintaining high journalistic ethics is a challenge when dealing with infomercials media aimed primarily at increasing circulation or viewership.

Members of the media bristle at the suggestion that ethics is being disregarded when preparing "stories." Yet we often see reports that mix news and opinions or that present opinions as news. Misquotations are corrected in the fullness of time, and often on the back page of a paper. Then there are the banner headlines that catch your attention but have little to do with the gist of the story that follows. How about checking sources before going to print or on air? Are the facts still verified as they were decades ago? Is the subject of ethics in media taught at schools of journalism?

Some journalists who have been embedded with Canadian military units have highlighted ethical issues that they had to deal with such as how much personal information to divulge in a story. When do you release the information you have gleaned? Do you share your insights with the local commander before going public? These are only a few examples of the issues raised.[20]

From the other side of the coin, how much private and personal information/opinions do members of the Forces share with embedded journalists?

Perhaps we can oversimplify a concern of mine by looking at what happens when an ethical "event" occurs. In any "crisis" the media and the population like to quickly identify the miscreant regardless of the evidence or lack thereof. Another issue has to do with the concept of being innocent until proven guilty which is often reversed because of the state of the "victim."

Out of the morass should come a "saviour" or rescuer to save the day. This is what the media believes it is doing. The three elements of the villain, the victim and the saviour are simplistic. However, it is what sells papers and/or airtime and gives media such as blogs exposure; therefore, oversimplification at the expense of justice increases our collective cynicism.

Here again Savoie wades in with: "… the media are mostly interested in the drama of individuals and are in a constant search for winners and losers to make good headlines."[21] "… [O]nce a scandal hit the front page of the newspapers or came to dominate evening news on television, politicians were always quick to call for new centrally prescribed rules to guide the delivery of public services and the work of civil servants."[22] "For MPs, accountability is about politics – about assigning blame and scoring political points in the media."[23]

National Security and Ethics

Our society is currently facing ethical issues under the heading of national security. We claim that what we want is peace, order and good government, but we are often unable to articulate what that means and what Canadians truly cherish. It becomes a difficult articulation of our shared values.

The first thing that we ought to do is define national security; the best one that

I have ever seen is the definition given by Brigadier-General Don Macnamara (Retired) at the National Defence College circa 1986. He defined national security as "the preservation of a way of life acceptable to the Canadian people and compatible with the needs and aspirations of others. It includes freedom from military attack or coercion, freedom from internal subversion, and freedom from the erosion of the political, economic, and social values which are essential to the quality of life in Canada." However, it raises the need for another definition, that of national values. What are Canada's values and who accepts them?[24] Finally, the linkages between sovereignty, national values, national interests, national security, foreign and defence policies and ethical intervention must be exposed to understand their impact on important policy development.

Of note, a definition of war can be confusing because you have to clearly understand the spectrum of human conflict that ranges from road rage through peace-restoring operations to all-out world war. Then there are the concepts of a just war, which has been the subject of discussion since Cicero, St. Augustine, St. Thomas Aquinas and many philosophers to this day. It focuses on three aspects of conflict: a just cause for entering into war, acceptable behaviour during warfare and a process to end the war. In addition, there are the Geneva Conventions of 1929 followed by the third edition in 1949 that deal with the handling of prisoners of war and the treatment of individuals in conflict. The challenge today is how to apply these principles to non-state actors such as terrorists. The changing face of battle coupled with the current use of defence, diplomacy and international social development raises new sets of questions such as what is the place of non-state actors in the spectrum of conflict and the clash of cultures.

My observations are that those who understand issues relating to national security, national values and national interests often cannot manage the situation because they frequently have no power; those who could manage the issues don't necessarily understand the scope and complexity of these issues. For example, politicians may use inflammatory rhetoric for local effect without regard for external interpretations of their intemperate comments. Countries and people regard each other through different sets of lenses; thus, intentions can be easily misinterpreted. As reported in *The Economist* in July 2007, "An uncompromising Iran and an uncomprehending America may be stumbling to war …"[25]

Islamo-terrorists promote the concept of humiliation and the frustration that results from their perception of victimization and loss of social influence. They seek vengeance for perceived humiliations, use inflammatory semantics and sophism, and commit acts of extreme destruction. It is also evident that they seek a return to 12th century human and social conditions. Yet, they do not hesitate to use computers, the Internet, motorized vehicles and sophisticated electronic devices in their weapons of terror. Terrorists vocalize an empty rhetoric in pursuit of their goals that are to strike terror for the sheer delight of causing mayhem and to feel important. The *Ottawa Citizen* opined in an editorial on 28 November 2008 that:

> Terrorists who kill in the name of Islam don't need "motives." They kill because, in their view, they have a religious duty to do so. The hijackers who orchestrated the 9/11 attacks on the U.S. never issued demands. Killing, for them, was an expression of faith.[26]

The American government, aided by its media networks, is in a state of fear and terror that has often led to anger, paranoia, xenophobia and over-reaction. This has further led to a serious restriction of freedoms and disregard for some existing laws. This is

contrary to the fundamental principles of the American constitution and social structure. The remainder of the Western World has responded to terrorism in a variety of ways that are generally more muted and restrained.

When it comes to Afghanistan the following emerges: There is an unwillingness to take the time and effort to consider the elements of the issue such as women's issues, damaged infrastructure, disparate social elements, organized crime, corruption, education, health and the effectiveness of the UN and NATO.[27] Quebec isolationism and Canadian dislike of the US Bush administration do not permit an informed dialogue on many global issues. There does not appear to be Taliban leadership available to negotiate with. (To be a leader one has to control forces at hand, which is doubtful in a warlord structured society as in today's Afghanistan.) Extremism and confused world powers make the whole environment perplexing.

Where does ethics fit in all this? There is a crying need for informed dialogue where it is important to not only keep the tone of the dialogue civil, but also to avoid extreme and/or dogmatic semantics; ensuring that respect and integrity prevail. Thus, the importance of using logic in the dialogue on issues as Habermas suggests.[28] The use of fundamental international values such as respect, truth, integrity is critical. Finally, there must be an absolute condemnation of terrorism in any form.

My questions are:

- How much freedom do we sacrifice to ensure what we think of as security?

- What are our responsibilities as free citizens?

- Who determines the limits of actions by the state? That is, who is ultimately responsible?

- Is it true that the higher we go the more diffuse responsibility gets?

Ethical Leadership

In any organization there are shared values, stated or not, that drive people to behave in certain ways. If the organization is to succeed there is a need for leadership and management. I see leadership as a means to get people to do something that you want done. Effective leadership will result in people going the extra mile for you and for the organization. That is why leadership is a critical element for success. It is also why the effective leader will ensure that the shared values always remain in focus.

The leader gets people to do what is required by following their example, thus the need to set the correct tone at the top of the organizational pyramid. In addition, we are all role models to someone regardless of where we stand on that pyramid; thus, the need for open dialogue on the shared values and requisite behaviours. The bottom line is: "Walk the talk!"

Lee Iacocca highlights the nine "Cs" of leadership as: curiosity, creative, communicate, character, courage, conviction, charisma, competent, and common sense.[29]

In the last decade the Canadian Forces has published numerous books, pamphlets and papers on the subject of ethical leadership. I would draw the readers' attention to this extensive reading list.[30] My starting point would be *Duty with Honour* and then I would apply the values and program activities found in the comprehensive and excellent *Defence Ethics Program*.[31]

Over the years I have met many leaders of all sorts, some good, some just OK and some that I swore I would never emulate. One who left an unforgettable positive impression on me was the late Air Commodore Leonard Birchall, OC, OBE, DFC, CD, OOnt.

It is said that Winston Churchill dubbed Air Commodore Birchall "The Saviour of Ceylon" because he had given warning of the approaching Japanese fleet before he was

shot down and became a prisoner of war of the Japanese. His story of torture and slave labour is horrific, but it also highlights the need for effective leadership based on strong values when survival is at stake.

Birchall spoke eloquently about leadership, which he found was based on three major characteristics: as an effective leader, you have to have character; your personal values have to be firmly engrained into your personality; and you have to focus clearly on the shared values of the group. In addition, he held that competence was a critical element for the simple reason that no one wants to follow an incompetent, save out of shear curiosity. Finally, comradeship is a valued characteristic of leadership. The human touch is key to developing an esprit de corps that will allow people to go the extra mile. In the circumstances of prisoners of war, comradeship became a pure element of survival. There are many other examples of ethical leadership under duress.

To any person wishing to lead I would recommend reading his lecture on leadership. Allow me just one quote:

> Incidentally, the most succinct definition of leadership I have ever heard is being able to tell someone to go to Hell and have them [sic] look forward to the trip. If you ever have to lead troops into combat, and I pray this will never happen, you will find that you appear before your men/women stripped of all insignia and outward signs of authority to command. Your leadership is judged not by your rank, but by whether your men/women are completely confident that you have the character, knowledge and training that they can trust you with their lives. Now men/women are shrewd judges of their leaders, especially when their lives are at stake, and hence your character and knowledge must be such that they are prepared to follow you, to trust your judgement and carry out your commands.[32]

In my observations, effective leadership needs three key elements. The most important one is that of trust. If the individual is not trustworthy for whatever reason (lack of shared values, competence, etc.), no effective leadership is possible. This trust must be lateral and vertical regardless of the management/rank structure. Employees, peers and superiors must trust the individual. There is also a need to be loyal laterally and vertically as well. However, loyalty is somewhat dangerous because being overly loyal and protective of a group may result in a lack of transparency leading to ethical lapses. It is important to avoid blind obedience to power and to overprotection. Finally, for an organization to be ethically led means that there is effective leadership at all levels. I hold firmly that it is individual ethical behaviour that sustains the positive reputation of any organization.

We are dealing with human beings with their attendant frailties. Errors occur and it is important that lessons be learned from these mistakes in behaviour and leadership. Playing the blame game is not very useful in this context. I remember military leaders who held themselves above the rules of the organization and believed that they could do whatever they wished. A few got away with it but none could hide it. Their behaviours hurt the organization and the profession of arms.

Those who rely on an old wasted saying of "rank has its privileges" are waving a red flag indicating a likelihood of abuse and misuse if not even fraud. There are privileges that come with position and rank, but these are well defined often based on simple courtesy. Misuse and abuse is seldom invisible, and it usually emerges into the public eye in the fullness of time.

A reading of the Auditor General 2003 Special Report to Parliament on The Office of the Privacy Commissioner[33] highlights the failure of leadership from a bully. It is a classic description of how to ruin the

workplace atmosphere and reputation of a public organization. Then, there are the numerous varied cases of fraud in organizations. The conclusion that I draw is that in this current electronic environment it is very difficult, if not impossible, to act unethically and not have it observed by a number of people.

All these errors and crimes lead me to ask: "Why do these things occur?" In my opinion, many occur because of a lack of focus on values. I also wonder why peers or other members of the organization do not stop these people before it ruins everybody's reputation.

Ethical Decision Making

It is difficult to be an effective ethical leader in the current high-pressure environment with its many pitfalls. How we decide what course of action we will follow is often complex and difficult to resolve. Some of it may appear to be relatively simple, but we face some interesting challenges. I now turn to the decision-making process we each follow in our daily life. Keep in mind that ethics is doing the right thing, while good management is doing things right.

Much has been written about decision making. I find most of it applicable to an environment where there is time for contemplative analysis thus the process can be thorough. I am thinking of public policy writing or program development for example, but we often do not have the luxury of time. Think of the police officer facing the armed demented individual wishing to be shot, but who poses a real danger to society. What the officer does next is not the outcome of a lengthy analysis and dialogue with civil society. It has to be assessed, evaluated, decided and executed in a matter of minutes, even seconds.

There are many military examples of ethical decision making. There is one that I find particularly illuminating. On 25 April 1944, HMCS Haida, under command of Commander Harry DeWolfe, stopped in the English Channel after contact with German destroyers to pick up survivors of the sunken HMCS Athabaskan. (DeWolfe became Chief of Naval Staff and HMCS Haida is now alongside in Hamilton.) The best narrative of the Captain's decision, against orders, to rescue fellow sailors is contained in "*The Canadians at War*."[34] Other descriptions of military decision making can be found in Christie Blatchford's *Fifteen Days* or in Carol Off's *The Ghosts of Medak Pocket*.

My approach is based again on observations and suggests an increasing level of analysis depending on the circumstances. For example, I start with a quick sniff test to see if there is the potential for an ethical dilemma and consequences of note. I ask:

- Is it legal?

- Is it ethical?

- Is it reasonable?

- Is it defendable?

Obedience to laws is a minimum standard. The law tells us what we **must** do while ethics tells what we **ought** to do.

Linda Treviño and Katherine Nelson remind us that our gut is also important. In the second edition of their work *Managing Business Ethics* they highlight eight steps to sound ethical decision making in business— one of which is checking your gut. They also state that empathy is an important emotion that can signal awareness that someone might be harmed.[35]

If something does not feel right then another look is required. The gut reaction and the sniff test will likely determine if you need to review the situation in depth. The required analysis then becomes more elaborate, and many authors have offered their approach to ethical evaluation. They appear to all follow some relatively similar path and ask similar questions.

In a 2007 paper, Cornelius von Baeyer of Ottawa highlighted the need for the decision to take into account the four pillars of ethics: rules, consequences, values and discourse. Indeed, duty-based ethics demand compliance with the rules—my "is it legal?" Results-based ethics ensure maximizing outcomes; values-based ethics ensure making integrity come to life; and, discourse ethics ensure reaching good decisions.[36] It would seem to me that decision making is complex and must be practiced to hone the required skills. It is important therefore to define the problem; identify rules, desired outcomes and values; establish consultative dialogue; make the decision; and follow-up. In military operations speed is of the essence, as is accuracy. Common sense and drills come into play, often with life and death results.

All these authors and I have stressed that in resolving ethical dilemmas or challenges to our values, we must ensure that we know:

- What the facts are.

- Why we have a potential or real problem.

- What our obligation to act is.

- What alternatives are open to us.

- What the consequences of our actions or inactions are.

- Who we should speak to about the issue(s).

The Defence Ethics Program offers guidance on dialogue by making an intranet site available on the subject, issuing an annual Canadian Forces General message (CANFORGEN), making presentations, ensuring that there are Level 1 plans and engaging senior leadership. In addition, the Defence Ethics Program offers specific guidance on decision making by reminding members that they must assess the situation (who, what, when, where, why and how),

develop options, assess risks, consider values and ethics, select a course of action and act upon it.

Let me add a note of caution. When dealing with ethics and ethical decision making, one must avoid paying too much attention to delaying comments or excuses such as:

- It is not illegal.

- We have always done it this way.

- Everybody does it.

- It is the only way to achieve the expected results.

- This is how we can say "thanks" to the members.

- It will be beneficial to the organization.

- No one will be hurt.

A Final Thought

The "self" is the focus of our daily interaction as individuals living and working in organizations in a social context. To function we need to work with others and balance our needs with those of the group and of our society. This forces us to deal with organizational cultures and often face a clash of values. To function effectively and to ensure a positive workplace atmosphere, we must make ethics in organizations alive and buoyant, thus the need to harmonize our values with those of specific organizations and society as a whole.

The reader will have understood by now that it is important to know not only where we, as individuals, come from but also the social, cultural and religious biases that drive us. In other words, we need to first identify our personal fundamental values such that we are able to establish our requisite behaviours in order to lead effectively. I have always said that it is important to brief

what you are about to do, then do what you have briefed. While acknowledging that it is not easy to be a good leader, a military acquaintance recently said: "I mean what I say, I say what I mean, and I do what I said."

It is important for individuals to get actively involved in positive ethical behaviours by ensuring that there is time available to think, to achieve ethical decision making and to provide effective leadership.

In our current social environment, the big challenge that remains is that some people appear not to care about organizational ethics but appear more self-centered as they put self before community. It is interesting to note that the Defence Ethics Program clearly states as its principles "serve Canada before self " and "respect the dignity of all persons." Perhaps we could consider that as a personal motto.

CONCLUSIONS

At the start of this paper I alluded to a number of leaders that I observed and to the human condition that drives our actions. My observations lead me to believe that most folks are well intentioned but often face formidable circumstances that distract them from the ethical path of doing good. We wish to do the right thing and do things right, but we are not always successful. That led me to ask some fundamental questions. It remains my hope that this paper may continue the fruitful dialogue on values, integrity and ethics that has been implanted in the Forces and its civilian associates.

We live in a complex and dangerous world where we are often in need of guidance. To that end, I am left with some fundamental questions, some of which must be discussed while others should be discussed:

- What are the shared values of my Canada, my social environment, my workplace, my family, and are these values underpinned by a specific dogma?

- What are my personal values?

- Was managing behaviours and social expectations better in the days of a perceived unique Western culture?

- Walk the Talk. Why is it so difficult to do?

- How can we each, personally, make a difference?

It still remains that we need to individually and collectively decide if these are the most important questions. Are they the best ones to sustain a dialogue or will they tend to close the conversation? Perhaps we can augment these by using case studies / examples from actual workplace and operations dilemmas. ■

Major-General Marc Terreau (Retired) CMM, CD had a lengthy career in air mobility culminating in command of Air Transport Group. A proud graduate of National Defence College, he spent the last six years of his career in National Defence Headquarters as Chief Review Services where he initiated an ethics programme applicable to both the Canadian Forces and civilian members of the Defence Team. Later he became a consultant on applied ethics, chair of the Ethics Practitioners' Association of Canada, a dedicated ethics practitioner, a member of the Air Command Advisory Council and the Honorary Colonel of 429 Squadron. He continues to do volunteer work in various sectors of Canadian society.

NOTES

1. See James Rachel, *The Elements of Moral Philosophy* (Toronto: McGraw-Hill Inc., 1993).

2. www.epac-apec.ca (accessed February 23, 2009).

3. Canada, *Fundamentals of Canadian Defence Ethics* (Ottawa: Chief of Review Services, 2002). Available online at http://www.dep.forces.gc.ca/dep-ped/about-ausujet/index-eng.asp (accessed March 2, 2009).

4. Leonard J. Brooks and David Selley, *Ethics & Governance: Developing & Maintaining an Ethical Corporate Culture* 3rd ed. (Toronto: Canadian Centre for Ethics & Corporate Policy, 2008).

5. Nan DeMars, *You Want Me To Do What? When Where and How to Draw the Line at Work* (New York: Simon & Schuster, 1998).

6. Patricia J. Harned, "Rule #1: It Takes More than Rules," *Ethics Today* (Arlington, VA: Ethics Resource Centre, October 28, 2008). Available online at http://www.ethics.org/ethics-today/1008/pat-column.asp (accessed February 19, 2009).

7. Canada, Values and Ethics Code for the Public Service (Ottawa: Public Works and Government Services, 2003). Available online at http://www.tbs-sct.gc.ca/pubs_pol/hrpubs/TB_851/vec-cve-eng.asp (accessed March 2, 2009).

8. *Summary of the Nolan Committee's First Report on Standards in Public Life* (The Stationary Office, 1995). Available online at http://www.archive.official-documents.co.uk/document/parlment/nolan/nolan.htm (accessed March 2, 2009).

9. Donald J. Savoie, *Court Government and the Collapse of Accountability* (Toronto: University of Toronto Press, 2008). Content of this source reprinted with permission of the publisher.

10. Mark Baetz, "Codes of Conduct in the Private Sector" (presentation, Canadian Centre for Ethics & Corporate Policy, October 8, 2008). Available online http://www.ethicscentre.ca/EN/events/past_events.cfm (accessed March 2, 2009).

11. Arthur Bishop, *Victoria Cross Heroes* (Toronto: Key Porter Books Ltd., 2008).

12. Canada, *Duty with Honour: The Profession of Arms in Canada* (Ottawa: Canadian Forces Leadership Institute, 2003). Available online at http://www.cda-acd.forces.gc.ca/cfli-ilfc/poa-pac/man-eng.asp (accessed February 23, 2009).

13. F. Clark Power, *Lawrence Kohlberg's Approach to Moral Education* (Irvington, NY: Columbia University Press, 1991) and James Rachel, *The Elements of Moral Philosophy* (Toronto: McGraw-Hill Inc., 1993).

14. David Bercuson, *Significant Incident: Canada's Army, the Airborne, and the Murder in Somalia* (Toronto: McClelland and Stewart, 1996).

15. Stephen L.Carter, *Integrity* (New York: Basic Books/HarperCollins, 1996).

16. Savoie, *Court Government*. See also: Canada, "Chapter 2—Accountability and Ethics in Government," *The November 2003 Report of the Auditor General of Canada* (Ottawa: Office of the Auditor General, 2003). Available online at http://www.oag-bvg.gc.ca/internet/English/parl_oag_200311_02_e_12924.html (accessed February 23, 2009).

17. See DeMars, *You Want Me To Do What?*

18. Savoie, *Court Government*, 144.

19. Ibid., 264.

20. Christie Blatchford, *Fifteen Days* (Toronto: Doubleday Canada, 2004) and Carol Off, *The Ghosts of Medak Pocket* (Toronto: Vintage Canada, Random House, 2004).

21. Savoie, *Court Government*, 251.

22. Ibid., 223.

23. Ibid., 279.

24. Michael Adams, *Sex in the Snow – Canadian Social Values at the End of the Millennium* (Toronto, Viking Press, 1997) and Michael Adams, *Fire and Ice: The United States, Canada and the Myth of Converging Values* (Toronto: Penguin, 2003).

25. "The Revolution Strikes Back," *The Economist* 384, no. 8538 (July 21, 2007): 2–3. Available online at http://www.economist.com/specialreports/displaystory.cfm?story_id=E1_JQGGRPQ (accessed March 2, 2009).

26. "Killers Who Need No Motive," *Ottawa Citizen*, November 28, 2008. Available online at http://www.ottawacitizen.com/news/killers+need+motive/1003057/story.html (accessed February 23, 2009).

27. Eric Morse, "Objectives in Afghanistan: Perception, Assumption and Realism," *On Track* 12, no.1 (Spring 2007): 28–30. Available online at http://www.cda-cdai.ca/quarterly/ontracklib.htm (accessed March 2, 2009).

28. Jurgen Habermas, *Jurgen Habermas on Society and Politics: A Reader*, ed. Steven Seidman (Boston: Beacon Press, 1989).

29. Lee Iacocca, *Where Have All The Leaders Gone?* (Toronto: Scribner, 2007).

30. Available at http://www.cda-acd.forces.gc.ca/pub/index-eng.asp (accessed March 2, 2009).

31. Available at http://www.dep.forces.gc.ca/dep-ped/about-ausujet/index-eng.asp (accessed February 23, 2009).

32. Leonard Birchall, "Leadership" in *Ethics in Practice: Proceedings of the Conference on Ethics in Canadian Defence, 30 and 31 October 1997* (Ottawa: National Defence Headquarters / Chief of Review Services, 1997), 26. Available online at http://www.dep.forces.gc.ca/publications/index-eng.asp (accessed February 23, 2009).

33. Available online at http://www.oag-bvg.gc.ca/internet/English/parl_otp_200309_e_12921.html (accessed March 3, 2008).

34. *The Canadians at War* The Readers' Digest Association (Canada), 1969.

35. Linda Klebe Treviño and Katherine A. Nelson, *Managing Business Ethics: Straight Talk About How to Do it Right*, 2nd ed. (New York: John Wiley & Sons, 1999) and DeMars, *You Want Me To Do What?*

36. Cornelius von Bayer, "Making Ethical Decisions in the Workplace: My Conclusions after 15 Years in the Trenches" (presentation, Ethics Practitioners' Association of Canada, Trillium Ethics Round Table, Toronto, November 13, 2007). Available online at http://www.workplaceethics.ca/article.html (accessed March 2, 2007).
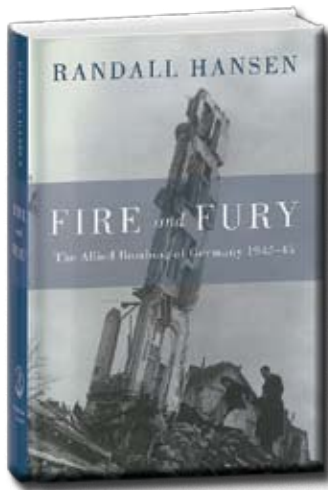
FIRE and FURY:
THE ALLIED BOMBING OF GERMANY 1942-45

BY RANDALL HANSEN

Review by **Colonel Randall Wakelam**, CD, PhD

In the fall of 2008 a number of full page op-eds appeared in Canadian papers dredging up, yet again, the debates about and changes to the wording of the Bomber Command panel in the Canadian War Museum. The authors of these rebuttals were Canadian historians Robert Bothwell and Margaret MacMillan (*Paris 1919*) and Canadian political scientist Randall Hansen. Perhaps coincidentally (or not) Hansen's own work about the bombing campaign was published in mid-October. *Fire and Fury* argues that Arthur Harris's insistence on city busting and area bombing did not shorten the war as the bomber commander claimed that it could, but that by not concentrating on target systems, actually lengthened the conflict.

This argument is not really all that new, but it is not Hansen's real agenda. Rather, the author fairly deliberately paints Harris as a commander who was simply bent on employing city bombing regardless of its effectiveness or morality. Hansen spends considerable time pointing out how Harris's superiors attempted to get him to take on precision attacks, how Harris refuted their arguments and how Harris, at least passively, ignored their direction.

Hansen juxtaposes Harris's bloody-mindedness with the apparently zealous pursuit of precision bombing by the United States Army Air Force. He points out that the Americans had developed various technologies and tactics which allowed them to hit military targets precisely. Equally, he describes how they, both at the command and individual level, vehemently opposed any direction to conduct attacks against cities and civilians, which was the Bomber Command norm.

Unfortunately, for readers, Hansen does not represent the historical facts accurately. He misses existing sources which clearly show that the Americans conducted extensive area attacks and worse (in Hansen's eyes one might conclude) sought to hide this fact by claiming that their visual techniques, regardless of the 10/10s under cast, allowed precision aiming. Hansen also limits discussion of the United States' bombing of Japan, both incendiary and atomic, to just a few sentences.

The author is also guilty of misinterpreting hard data. In one case he claims that 11,000 bombers raided Dortmund on 12 March 1945 when in fact the figure was 1,100. In another

instance he misinterprets a significant study. He says that the 1941 Butt Report showed that two-thirds of Royal Air Force bombers bombed more than 75 miles from their targets while in fact Butt said that aircraft were bombing outside of a five mile radius of the target (an area of 75 square miles). A suspicious reader might conclude that these misinterpretations serve to make Hansen's attack on Harris all the louder.

There is little argument among air power historians that Harris does represent a curious case. Why, as the war was being won so convincingly and as his crews by mid-1944 were capable of better precision accuracy than the Americans, did he continue to insist on area attacks? If Hansen's volume causes us to reflect on this question—and on the morality of war in any form—then it does have a redeeming value for aviators and military professionals. ■

Colonel Randall Wakelam is currently Director of Research and Symposia at the Canadian Forces College.

NO CLEAR FLIGHT PLAN:
COUNTERINSURGENCY AND AEROSPACE POWER

EDITED BY JAMES FERGUSSON AND WILLIAM MARCH

Review by **James R. McKay, PhD**

The current trend in warfare is land-based asymmetric war waged by non-state actors against large coalitions led by the United States. The use of asymmetric war (in the form of an insurgency) means that the enemy seldom presents itself in a manner convenient for what the aerospace-minded community considers the optimal application of aerospace power.   In recent years, aerospace power has often ended up being applied in a supporting role to land-based forces in counter-insurgency operations, namely those of surveillance/reconnaissance or acting as "flying artillery." To a community that developed as a result of

the belief that aerospace power is best applied decisively (i.e., the means by which a war is won) against a near-peer competitor, this is not an intellectually comfortable position. It strays perilously close to the existential debates of the past. As a result, the potential effects of counter-insurgencies on air forces form an issue that is ignored only at an air force's peril.

This edited anthology of papers is the product of a pair of conferences that occurred in 2007 and sought to explore issues surrounding the effects of the growth of counter-insurgencies on air forces. The two

conferences in question were the Air Force Historical Conference in Toronto and the Third Biennial University of Manitoba's Centre for Defence and Security Studies Aerospace Power Forum in Winnipeg. The editors assembled a series of historical and contemporary papers presented at one or the other conference that address issues of the doctrine and employment of aerospace power in counter-insurgencies. The title is apposite and belies the nature of the problem. Yet one must bear in mind that "Unconventional wars grow because of the peculiar local soil of individual cultures. They are causal reactions to perceived opportunities in political-power struggles or social weak-nesses in particular societies. They are not interchangeable… ."[1] What may be more uncomfortable is the idea that a "clear flight plan" for counter-insurgency warfare does not exist, and it may not even be useful.

The nature of the papers highlights the problem described in the title rather well. For the sake of brevity, it is not possible to summarize all of the well-crafted and incisive contributions, but some merit particular mention. Tami Davis Biddle's article on service culture and identity within the United States Air Force and Royal Air Force illustrates the issue well by noting that both of those services emerged as potential "tools of first resort" that offered relatively "clean" and "efficient" ways of war. This goes against the complicated and messy grain of counter-insurgencies, where the enemy seldom allows itself to be detected or attacked in clean or efficient manners. William T. Dean III's paper on French air power in small wars is extremely informative, but offers the perspective that air power in that historical experience was best served as flying artillery. Mark Clodfelter's discussion of Vietnam is worthwhile for its discussion of the applications of air power at the tactical and strategic levels, and his warning that an over-reliance on aerospace power's capacity to strike may even be counterproductive in trying to defeat an insurgency is worth heeding. Yet the most relevant discussion from a contemporary perspective is Robert Owen's paper on structuring air forces for counter-insurgency. He argues that the likelihood of having to fight a counter-insurgency is high, and therefore, it behooves every air force to consider the problems in advance of having to face them. In addition, he argues that counter-insurgencies are not fundamentally different for an air force in that they represent a series of "strike, logistics, and intelligence problems that differ little from those of other conflict types… ."[2] In short, he counsels that the wisest course of action for an air force is to be capable of adapting to a series of potential types of war as opposed to optimizing for any single type of war.

The book is an informative and useful primer on the issues surrounding the application of aerospace power in counter-insurgencies. The combination of historical papers largely based on national experiences in "small wars" and contemporary papers that explore doctrine and its application provides a powerful mix of thought on force employment and force development issues. For this reason, it would be of interest to those studying the phenomenon of insurgency and how to deal with it as well as those currently serving in the Air Force. If nothing else, it allows one to consider the issue of aerospace power's place in counter-insurgencies from a more informed perspective. ■

Dr. James McKay is an Assistant Professor of Political Science and the Director of Faculty Services at the Royal Military College of Canada.

NOTES

1. Douglas Pike, *PAVN: People's Army of Vietnam* (Novato: Presidio, 1986), 53.

2. Robert Owen, "Structuring Global Air Forces for Counterinsurgency Operations," in *No Clear Flight Plan: Counterinsurgency and Aerospace Power*, Silver Dart Canadian Aerospace Studies Volume IV, eds. James Fergusson and William March (Winnipeg: Centre for Defence and Security Studies, University of Manitoba, 2008), 234.

Resurrect Celebrate Motivate
RCAF Sabre Takes to the Skies Once Again

CF Photo by Cpl J. Chiasson

By **Mary Lee and Dan Dempsey**

In 2007, a team of aviation enthusiasts—most with an Air Force background—came together with the inspirational idea of offering to Canadians a tangible platform to help commemorate 100 years of Canadian aviation history.

The project involves resurrecting a Canadair F86 Sabre 5 jet fighter in the legendary Royal Canadian Air Force (RCAF) Golden Hawks' colours. It will be flown across the country in 2009 to celebrate the 100th anniversary of powered flight in Canada.

The F86 was the RCAF's principal fighter during the first decade of the cold war. Canadian fighter pilots flew the Sabre with 12 RCAF squadrons that were based in Europe with No. 1 Air Division as well as at several RCAF stations within Canada. While on exchange duties with the USAF, 22 RCAF pilots flew the F86 in combat during the Korean War.

The project name, Hawk One, derives from the Golden Hawks' namesake and will serve as the cornerstone for the Canadian Centennial of Flight events in 2009. Hawk One will make approximately 20 air show appearances across Canada which will include flypasts with the Snowbirds, Canada's nine-plane jet aerobatic team.

Technicians prepare the F86 Sabre before an engine run-up
at the Gatineau airport   CF Photo by Cpl K. Sauvé

Test pilot Paul Kissmann performs the engine run-up
                              CF Photo by Cpl K. Sauvé

The F86 Sabre piloted by Paul Kissmann arrived at 4 Wing, Cold Lake, in the late afternoon sunlight on November 20, 2008. The F86 Sabre, which was the RCAF's principal fighter during the first decade of the Cold War, is here to be refurbished to the Golden Hawks' colour scheme and will fly to numerous events throughout Canada this year during Centennial of Flight celebrations and events. The Hawk One paint team is comprised of Air Components and Structures Technicians from 1 Air Maintenance Squadron (1 AMS) and the 410 Squadron Graphic Designer, Jim Belliveau.

CF Photo by MCpl H. Folfas

The Canadair F86 Sabre was to become the RCAF's most famous and unanimously well-liked operational fighter. RCAF Sabre squadrons were a force to be reckoned with in the European skies. 17 August 1951   CF Photo

The Canadian Centennial of Flight heritage project is designed to celebrate the 100th anniversary of powered flight in Canada, just as the Golden Hawks were created on March 1, 1959 to celebrate the 50th anniversary.

The resurrection of a Golden Hawk Sabre to celebrate the 100th anniversary of flight in Canada represents an elegant salute to our nation's rich aviation heritage. The direct lineage to the Golden Hawks offers a rare

Corporal Mike Williams (above left), and Corporal Jeff Brawn (above right) spray a layer of gold aerospace paint onto the surface of the Korean War vintage Sabre Mark 5/6 aircraft.   CF Photos by Pvt P. Turney

Corporal Jeff Brawn (above, left), Private Richard Day (above), and Private Devon Malazdrewicz (left), Aircraft Structures Technicians from 1 AMS, Cold Lake, carry out last minutes touch-ups to the freshly painted Centennial of Flight F86 Sabre Hawk One.

CF Photos by Sgt A. Martineau

(left) Pilot Paul Kissmann, disembarks the F86 Sabre after a flight. As the Air Force prepares to commemorate the 100th anniversary of powered flight in Canada this year, a Golden Hawk shall lead the way. Hawk One is recreating one of the classic Sabre fighter jets that were painted in the gilt colour of the RCAF celebrated Golden Hawks aerobatic team.

CF Photo Cpl K. Sauvé

opportunity to effectively link the past to the present with an aerobatic and ground display that is sure to thrill and motivate hundreds of thousands of Canadians from coast to coast.

The Hawk One project is a partnership among Vintage Wings of Canada, the civilian sector through corporate sponsorship and "in-kind" support from the Department of National Defence. The project has been established as a "non-profit" organization and will be funded completely by corporate sponsorship secured by the Hawk One organization.

Michael Potter, founder of Vintage Wings of Canada, which operates and displays a collection of classic aircraft from their facility at the Gatineau Airport in Quebec, generously purchased and refurbished the Sabre which served 16 years in the RCAF prior to being demilitarized and registered as a civilian aircraft.

To learn more about Hawk One, visit the website at: www.hawkone.ca ■

Mary Lee is on the staff of Air Force Public Affairs in Ottawa. She is currently working on the Centennial of Flight project and is the Hawk One PAO.

Dan Dempsey is a Hawk One pilot and Team Historian. He is the author of "A Tradition of Excellence: Canada's Airshow Team Heritage."

CF Photo by Cpl K. Sauvé

PUSHING THE ENVELOPE

Staff Systems: More Grist for the Mill

By **Colonel Randall Wakelam, CD, PhD**

Paul Johnston's articles on staff systems have been excellent in drawing attention to the Air Force's need for staff officers and staff processes. It is hoped this short commentary will provide additional perspective so that as the Air Force examines its staff needs and what professional development is needed to produce effective air staff officers, it does so with as much context and history at its disposal as can be made available.

Not coincidentally it was 65 years ago, at the height of the Second World War, that the Royal Canadian Air Force (RCAF) conducted its first War Staff Course at what is now the Canadian Forces College in Toronto. The course dealt largely with staff procedures, but still included guest lectures to set these lessons in a broader operational and strategic context. In 1945, the RCAF was ready to expand the programme to six months. In writing about the course and its aims, the Commandant, Air Commodore Wait, wrote:

> The [proposed] Course … is a comprehensive one, and will be *conducted on University lines*. The course is designed to make an officer *think straight* and to *get his thoughts down clearly on paper*. The amount and depth of his thinking will depend entirely upon himself. There will be little use for anyone to come on the Course expecting to do only the bare minimum of work and to get by. The candidate must want to make the Service a career; want to take the Course; *have a high level of ability to learn*; and have a reasonable education (minimum Senior Matriculation).[1] [Italics added by author.]

By the late 1950s, the original 10-week programme had grown to a full year, the purpose of which was captured in the course calendar:

> The RCAF Staff College makes no attempt to graduate experts in a particular field, nor does it expound any easy universally applicable doctrines. Rather by providing its graduates with an *education of the broadest scope* and by *developing habits of clear thinking*, it attempts to provide them with the breadth of interest, *openness of mind, reasoning ability, and a broad view of their Service and profession*, which will enable them to *master the specific tasks of any appointment and to make sound decisions in any situation*.[2] [Italics added by author.]

This last thought is one to which we can return shortly.

Johnston says that the RAF staff system during the war resembled the British Army's diarchy of operations (ops) and administrative/quartermaster (AQ) functions. While this was true, there, apparently, the similarities started to pale. A contemporary observer, Lieutenant-Colonel Charles Carrington, the Army liaison officer at Bomber Command, noted some unique characteristics, as did other writers. The Air (i.e., ops) staff tended to be populated by young, hard-charging, upwardly mobile flyers, while the administrative staff was more likely to contain former flyers or those who came from support branches.[3] Equally intriguing, there was no standard headquarters organization within the Command. As noted by staff in 5 Group:

> There is no standard system in Bomber Command for the allocation of Air Staff duties at groups and this differs considerably from one Group to

another … . As a result [of shortages of qualified personnel] allocation is often governed by personalities rather than by the basic principles of sound organization.[4]

This was apparent within the Command Headquarters as well. By 1943 the senior air staff officer (SASO) had been elevated to a deputy commander in chief, in effect a chief of staff. And beginning in February 1944 there were two SASOs, one for tactical operations and one for strategic bombing. We might reasonably conclude that the same sort of needs-based local arrangements, shifting missions, and personality-driven organizations applied to other commands and groups. We might also surmise that the RAF was experiencing the same sort of transformation, organizational challenges, and chaos that the Air Force in Canada has faced over the past two decades.

So what sort of staff officer do we need in these circumstances? There is little doubt that we have a requirement for officers who understand and can use staff conventions and processes. They need to be capable of producing timely and accurate staff products, using standardized formats and lexicons. But these officers are likely to be found working in squadron and wing staffs as well as filling lower level appointments at the Air Division and higher headquarters. Their work is unquestionably complicated, but it is not work which requires them to deal with complexity and ambiguity—in other words, to deal with "problems which defy solution."[5] These are the sorts of institutional issues that Staff College faculty were thinking about when they called, in 1959, for broad education to deal with any situation. This sort of staff education gives senior staff appointments and the commanders the ability to build campaign plans, figure out how to work in joint and combined collations, and deal with whole of government solutions. In short, we need those who can conceptualize solutions and, equally, those who can put those concepts into action. Both are required if the Air Force is to have an effective staff and staff system now and in the future. ■

Colonel Randall Wakelam, a graduate of the Canadian Land Forces Command and Staff Course and the Canadian Forces Command and Staff Course, is currently Director of Research and Symposia at the Canadian Forces College.

NOTES

1. William R. Shields and Dace Sefers, Canadian Forces Command and Staff College: A History 1797-1946 (Toronto: Canadian Forces College, 1987), 4-28. This document was part of a Canadian Forces College history project.

2. Canada, Department of National Defence, "Conclusion," in R.C.A.F. Staff College Calendar Course 23: 1958-59.

3. Charles Carrington, Soldier at Bomber Command (London: Leo Cooper, 1987), 14-7. See also Group Captain A. H. Stradling, The Brass Hat: Being Hints on How to Make the Job Easier (Aldershot, UK: Gale & Polden Limited, 1951).

4. "Organization of Air Staff at 5 Group Headquarters", n.d., UK National Archives Air 14/1892.

5. This is one of the central themes of Canada, Department of National Defence, Report of the Officer Development Board (Ottawa: DND, 1969), which is often referred to as the "Rowley Report."

The Wing Concept Revisited: The Adoption of Capability-based Wings as an Alternative to Groups

By **Lieutenant-Colonel A. Lee Smith, CD**

With the imminent creation of 2 Canadian Air Division, there are also strong rumours that the groups (which disappeared in 1997 when the Commander of Air Command [Chief of the Air Staff] moved from Winnipeg to Ottawa and 1 Canadian Air Division Headquarters was resurrected) will be recreated.

Having been at the forefront of the implementation of the wing concept[1] in 1993 under LGen Huddleston, I have always been a supporter of that initiative and feel that it went a long way to reinvigorate the Air Force approach to operations. Nevertheless, there were aspects of the wing concept that bothered me at the time and, perhaps, now is the perfect time to re-examine the concept as a possible alternative to bringing back the groups.

I have always believed that a wing should be a fighting formation, made up of two or three squadrons (sqns) of identical aircraft (for example, 4 Wing Baden [pre-1993] consisted of three CF188 squadrons) or two or more squadrons of different aircraft that would fight together (for example, 366 Wing, Mountain Home Air Force Base [pre-2002] consisted of EF-111A, F-15C and B-1B squadrons). The latter is commonly referred to as a composite wing. When the wing concept was instituted in Canada, most of our wings were composite wings, in that they were made up of disparate units; however, few of them met the definition of a fighting formation. A good example of this is 19 Wing where, at the time, there was a long-range patrol squadron (CP140), a combat support squadron (CT133) and a search and rescue squadron (CC115/CH113). This situation has not changed significantly over the intervening years and arguably has gotten worse due to the standing down of various units. 3 Wing and 4 Wing now only have one operational CF188 squadron each and 14 Wing has only one operational CP140 squadron.

The reason that these composite wings existed is that, with the exception of 1 Wing and 12 Wing, they were geographically based. The Air Force had primarily taken the Canadian Forces base (CFB) structure and simply re-clothed it as a wing. Perhaps, now is the time to re-evaluate this structure and possibly apply the 1 Wing and 12 Wing model to the remainder of our wings.

This proposal would result in the creation of wings based on capability lines. For the moment, I would like to ignore the wings that do not operate aircraft (16 Wing and 22 Wing). Taking the remainder, I would envision establishing wings along seven capability lines:

a. air mobility;

b. fighters;

c. long-range patrol;

d. maritime helicopter;

e. search and rescue (SAR);

f. tactical aviation; and

g. training.

These capability-based wings would cross geographic boundaries and include all of the pertinent units involved in generating that capability, regardless of where they are currently located. Another critical aspect of implementing this concept is to physically separate the wing commander (W Comd) and base commander (B Comd), leaving each with their own unique set of responsibilities. Since 1993, these two hats have been worn by the same person. One major purpose of the wing

concept was to reassert the role of air base commanders in the chain of command.[2] This should be preserved in the role of the wing commander; however, the base commander responsibilities should be removed and assigned to another person. This allows the wing commander to be unhindered by geography. Base commanders would report to a specific wing commander but would not be in the operational chain of command. As technically is the case at present, the base would simply be another unit in the formation, albeit with greater emphasis on this distinction.

The easiest way to envision how this concept would be implemented is to discuss how each existing wing would be affected. For simplicity's sake, I will not address the test and evaluation flights and the non-flying units; however, they can be easily accommodated by the structure. This concept would see the following changes:

a. **1 Wing.** This wing is already structured in the fashion being proposed. It would continue to include the five squadrons that it has today: 400, 403, 408, 430 and 438.

b. **3 Wing / 4 Wing.** One of these wings would become the fighter wing and would include 409, 410, 414 and 425 Sqns. The other wing would be disbanded as a formation. B Comds of CFB Bagotville and CFB Cold Lake would report to the fighter W Comd. 419 Sqn would chop to a training wing; 417 and 439 Sqns would chop to the SAR wing.

c. **5 Wing.** 444 Sqn would chop to the SAR wing. 5 Wing would be disbanded as a formation and B Comd CFB Goose Bay would report to the SAR W Comd.

d. **8 Wing.** This wing would become the air mobility wing and would include 412, 426, 429, 435, 436, 437 and 440 Sqns. B Comd CFB Trenton would report to W Comd 8 Wing. The SAR W Comd would have operational control of 435 Sqn for its SAR responsibilities.

e. **9 Wing.** 103 Sqn would chop to the SAR wing. 9 Wing would be disbanded as a formation and B Comd CFB Gander would report to the SAR W Comd.

f. **12 Wing.** This wing is already structured in the fashion being proposed. It would continue to include the three squadrons that it has today: 406, 423 and 443 Sqns.

g. **14 Wing.** This wing would become the long-range patrol wing and include 404, 405 and 407 Sqns. 413 Sqn would chop to the SAR W Comd. B Comd CFB Greenwood and B Comd CFB Comox would report to W Comd 14 Wing.

h. **15 Wing.** This wing would become a training wing and essentially remain as it is today except for the addition of 419 Sqn. B Comd CFB Moose Jaw would report to W Comd 15 Wing.

i. **16 Wing.** As a non-flying wing, there would be no change.

j. **17 Wing.** This wing would become a training wing. 435 and 440 Sqns would chop to 8 Wing; the other current units would remain. B Comd CFB Winnipeg would report to W Comd 17 Wing.

k. **19 Wing.** This wing would become the SAR wing and would include 103, 413, 417, 424, 439, 442 and 444 Sqns. B Comds CFB Goose Bay and CFB Gander would report to W Comd 19 Wing.

l. **22 Wing.** As a non-flying wing, there would be no change. However, consideration should be given to separating the B Comd responsibilities from that of the W Comd.

As for the effect of this implementation on the larger Air Force structure, 1 Canadian Air Division would include 1 Wing, 3 or 4 Wing, 8 Wing, 12 Wing, 14 Wing, 19 Wing

and 22 Wing. 2 Canadian Air Division would include 15 Wing, 16 Wing and 17 Wing.

Both the creation of 2 Canadian Air Division and the possible resurrection of the groups has been mentioned in the context of creating additional operational positions for the development of Air Force brigadier-generals. The capability-based wing structure I have described also lends itself to that approach. As a minimum, the fighter and air mobility W Comds could be established as BGens. In the fighter case, this is driven by the existence of two large main operating bases; in the transport case, by the large number of units. Base commanders at Bagotville, Cold Lake and Trenton would remain as colonels. For the other wings, where the W Comd positions remain as colonels, the B Comd responsibilities should be given to a newly established lieutenant-colonel or double-hatted with one of the current lieutenant-colonel branch head positions.

The above proposal has been offered with a view of turning all wings into single-focus, fighting formations. This accomplishes the same purpose as re-establishing the groups but in a different manner and, perhaps, with a lower overhead and a reduced personnel bill. More than anything else, however, I would hope that this article will stimulate some thought and discussion. ■

Lieutenant-Colonel Lee Smith is an Aerospace Engineering officer who retired from the Regular Force after 35 years service in May 2007. A graduate of Royal Military College, he held various positions over the years at 419 Squadron, Director General Aerospace Engineering and Maintenance, CF18 Detachment St. Louis, Air Command Headquarters, 17 Wing Winnipeg and Canadian Defence Liaison Staff (London). On retirement, he was employed at 1 Canadian Air Division Headquarters as A3 Uninhabited Air Vehicle. In October 2007, LCol Smith recommended service in the Reserve Force and is currently employed at 1 Cdn Air Div HQ as the Aviation Life Support Equipment Special Project Officer.

NOTES

1. Paul Johnston "Staff Systems and the Canadian Air Force: Part 2 A Convoluted Evolution," *The Canadian Air Force Journal* 1, no. 3 (Fall 2008): 20-32. Available online http://www.airforce.forces.gc.ca/CFAWC/eLibrary/Journal/Vol1-2008/Iss3-Fall_e.asp (accessed February 13, 2009).

2. "Master Implementation Plan for the Wing Concept," (Winnipeg: Air Command Headquarters, 1993).