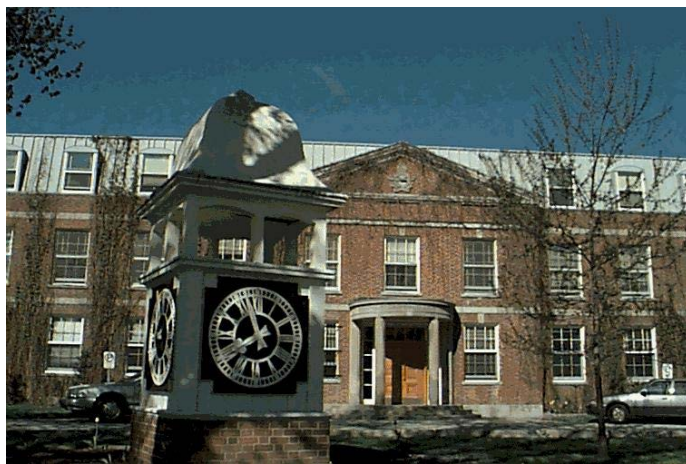


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**Air Force OPP:  
Operational Design and Planning  
for Smaller Headquarters**

Major D.S. Coutts

**JCSP 40**

***Exercise Solo Flight***

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CANADIAN FORCES COLLEGE – COLLÈGE DES FORCES CANADIENNES  
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**Air Force OPP:  
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By Major D.S. Coutts

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## INTRODUCTION

Royal Canadian Air Force (RCAF) doctrine has been growing apace over the last decade. The professional discourse surrounding what the Air Force (AF) considers as its accepted best practices is an organic, evolutionary process. While there have been many advances, such as the Canadian Forces Air Warfare Centre's (CFAWC) development of operational-level AF doctrine, there is yet to be doctrine published which specifically aims at the design of and planning for Canadian expeditionary airpower at the operational level.

This dearth of AF design and planning doctrine is problematic. While joint Canadian Forces Operational Planning Process (CFOPP) doctrine exists, and many of Canada's closer allies have similar doctrine, these best practices are optimized for use by larger headquarters. Given the smaller size of an Air Task Force (ATF) command and headquarters staff, the RCAF professional needs a tool that can address the constraints implicit in a smaller, rapidly constituted headquarters. With the short Force Generation (FG) timelines accorded to many AF high-readiness elements, a future Air Force Operational Planning Process (AFOPP) needs to minimize prerequisite experience and training time. Such a tool must also minimize the time and effort required for its employment. Given the small staff, the AFOPP must find simple ways to scale-down CFOPP and maximize effectiveness without incurring too much planning risk.

The academic literature underpinning current operational design and planning doctrine can be crudely partitioned into two areas: Naturalistic Decision Making (NDM), and the rational tradition, which for the sake of this paper will be referred to as Analytical

Decision Making (ADM). In simplistic terms, these can be thought of as representing the activities of design and planning, respectively. NDM and ADM complement each other's strengths. Accordingly, a future planning tool for smaller headquarters should incorporate a healthy balance of both approaches.

A tool for smaller headquarters can borrow from existing doctrine while retaining the advantages of each decision-making tradition. American Doctrine differs from CFOPP, with a heavier emphasis on NDM activities. British, Australian, and NATO operational-level planning processes are similar to CFOPP; they are largely born of the ADM tradition. Given the absence of substantial variation in the latter doctrines, the challenge of scaling-down CFOPP becomes an exercise in identifying where opportunities exist to save time and effort. While CFOPP is not optimized for use in a smaller headquarters, there are elements of Canadian and allied doctrine which continue to offer value; accordingly, the following four changes should be considered in the development of AFOPP: establish problem framing as a precondition to Stage 1 – Initiation; remove many elements of Stage – 2 Orientation, as they duplicate framing activities; Stage 3 – COA Development should emphasize the use of factors analysis and wargaming while limiting COA development to one friendly COA; and retain the remainder of CFOPP, but introduce red teaming.

## **METHODOLOGY**

The main intent of this paper is to outline possible approaches that smaller headquarters, such as an ATF headquarters, could use to conduct operational-level

planning. In reviewing existing doctrine, it becomes quickly apparent that CFOPP has been optimized for use in a larger headquarters, such as the Canadian Joint Operations Command (CJOC) in Ottawa. The match-match in scope between CFOPP and an ATF's command and control structures will be examined in more detail later in the paper. Given smaller ATF size and the possibility that an ATF may be a temporarily constructed organization, an ATF requires a scaled-down design and planning tool. While it would also be possible to create new processes from scratch, analysis here will focus on existing practices, as they have already been validated. Furthermore, any future planning tool must nest within the ends, ways and means of larger military systems. Accordingly, this paper will investigate the high-value aspects of current approaches, and from this analysis propose four adjustments to CFOPP which should be investigated further by the AF and wider Canadian Armed Forces (CAF).

In addition to bounding the scope of investigation, the terminology used in subsequent paragraphs must be simplified. For the purposes of this paper, definitions outlined by LCol L. Craig Dalton on the subject are useful: "*Planning* is a process of making detailed preparations to achieve a particular end", while *design* is an activity or exercise which is naturalistic and helps to communicate a conceptual framework of a complex system which enables planning.<sup>1</sup> To distance this vocabulary even further from

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<sup>1</sup> LCol L. Craig Dalton, "Systemic Operational Design: Epistemological Bumpf Or the Way Ahead for Operational Design?" Fort Leavenworth, KS: Command and General Staff College, School of Advanced Military Studies. 5, 6. Italics not in original.

the multiple interpretations found in doctrine, this paper will use the terms ADM and NDM as abstract representations of planning and design traditions, respectively.

As abstract concepts, ADM and NDM become useful in describing the challenges facing a smaller headquarters at the operational level, a discussion undertaken in the next part of this paper. Subsequent discussion will then delve into the strengths and weaknesses of each tradition, followed by a review of existing doctrine through each of the NDM and ADM lenses. The final section of this review will highlight adjustments that could be made to CFOPP in order to meet the needs of a smaller headquarters.

## **THE AIR TASK FORCE**

The deployment of air elements, both domestically and internationally, is nothing new.<sup>2</sup> However, the structure and function of AF command and control elements has been undergoing significant development, and a review of emerging concepts is important if the mismatch between CFOPP and ATF headquarters is to be understood. The discussion starts with the Air Expeditionary Wing (AEW) concept. In rudimentary terms, this AEW is like a deployable air base. A tactical formation, it contains the elements necessary to support and coordinate multiple detachments of aircraft from any AF community.<sup>3</sup> This AEW fits under an ATF. In understanding an ATF, it is useful to think of it more as a function than a physical structure. The ATF within a CAF Joint Task

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<sup>2</sup> Commander 1 Canadian Air Division, Interim Air Force Expeditionary Task Standards (1 Canadian Air Division, Winnipeg MB: file 3000-1 (OC DRTSET), 5 April 2013), 2.

<sup>3</sup>Canada. Department of National Defence. B-GA-400-000/FP-000, *Canadian Forces Aerospace Doctrine* (Winnipeg: Air Force Doctrine and Training Division, 2010), 28.

Force (JTF) will focus on risk management and residual responsibilities, such as managing certain technical authorities, operational risk processes, or other AF-specific, operational-level enabling activities.<sup>4</sup> Command of RCAF elements at the operational level will rest with the ATF commander (e.g. Operational Command – OPCOM). By contrast, control at the operational level functionally resides with an Air Component Commander (ACC), who will likely have Operational Control (OPCON) over the delivery of airpower.<sup>5</sup> In a coalition context, the ACC may be from another nation. In a domestic deployment scenario, although the ATF commander and ACC have functionally separate roles, the smaller scale will likely see the ATF commander and ACC as the same person. This person will likely also have a unified staff.<sup>6</sup> If the scope of an independent Canadian deployment is even smaller, the ATF commander may also be the tactical commander, whether that be of an AEW or of an ad hoc organization. There are several permutations of the ATF; current best practices are evolving along functional roles vice structured hierarchies, thereby allowing for a high degree of flexibility regarding command, control, operations support, and mission support.<sup>7</sup>

The important deductions from the description above are that an ATF commander will be the main RCAF commander in a given theater, and that he or she will have to apply RCAF professional insight in translating strategic aims and overarching objectives

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<sup>4</sup> Colonel Erick Simoneau, "2 Wing / ATF Concept" (Presentation, Commander 2 Air Expeditionary Wing RCAF, 2 AEW Bagotville), slides 3-7.

<sup>5</sup> Canada. Department of National Defence. B-GA-400-000/FP-000, *Canadian Forces Aerospace Doctrine* (Winnipeg: Air Force Doctrine and Training Division, 2010), 26-32.

<sup>6</sup> Simoneau, *2 Wing / ATF Concept*, slide 4.

<sup>7</sup> Canada. Department of National Defence. B-GA-400-000/FP-000, *Canadian Forces Aerospace Doctrine*, 49-51.

into tactical guidance for subordinate elements. In short, while the commander and his or her staff may not necessarily be defining and resolving operational-level challenges in all contexts, they must be prepared to do so.

The main design and planning tool available to the AF at this time is CFOPP.<sup>8</sup> While there are other technical planning tools and detailed control processes such as those underpinning a Theatre Air Control System (TACS), these concentrate on putting the right air effects in the right place at the right time<sup>9</sup>; they do not necessarily assist the RCAF professional in deciding the broader ends, ways and means of airpower application. Below the operational level, there is no common AF planning doctrine that could step up to fill this role. While each community has its own tactical doctrine, their planning processes are focused on the environments they specialize in, vice achieving AF intra-operability and designing broader airpower effects.

While an ATF must be capable of designing and planning at the operational level, the smaller size of the RCAF means that any deployed structure will be relatively small. As an example, the current ATF template for deployment of an AEW-sized capability consists of approximately two hundred and fifty personnel. This figure includes logistical support, operations support, airfield control, engineering support, and information support personnel.<sup>10</sup> The number personnel allocated to conceiving, designing and planning operational effects would vary depending on the theatre, but in all cases they would represent a small portion of the whole. By comparison, CJOC headquarters, and

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<sup>8</sup> *Ibid.*, 44-4.

<sup>9</sup> *Ibid.*, 22.

<sup>10</sup> Simoneau, *2 Wing / ATF Concept*, slide 19.



entity focused solely on designing, planning and controlling operations, has approximately five hundred personnel.<sup>11</sup> While not all of those people are devoted to designing, planning and controlling operations, it is safe to assume that a greater proportion of the CJOC headquarters is devoted to these core activities than in the ATF construct. With the scale of CJOC in mind, and acknowledging that the operational-level headquarters of Canada's allies tend to be even larger, it is no stretch to deduce that CFOPP or the methodologies of other nations and NATO are not optimized for use in smaller headquarters.

There are proponents who would argue that CFOPP is flexible enough to be scaled for use in a smaller headquarters. If there are insufficient resources, or time, to conduct the full gamut of planning, practitioners can pick and choose what planning elements are essential for the task at hand. In countering these notions, it is useful to create a mental picture separating ATFs into two versions. Within 2 AEW, the Air Component Coordination Unit (ACCU) will be comprised of staff well-versed in planning processes, and these staff are likely to deploy in a crisis or short-notice situation. However, the other ATF that the RCAF will keep at high readiness is constructed as a temporary organization, on an iterative basis, from various other units within the Air Force. This ATF will not have the same level of training in planning processes as the ACCU. In summary, the ACCU *could* use CFOPP, but would certainly benefit from a scaled-down version of CFOPP due to size of an ATF headquarters. High readiness ATF's outside of 2 AEW will likely *not* be filled with seasoned CFOPP practitioners, and

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<sup>11</sup> Murray Brewster, "Canadian Military Decision to Combine Three Headquarters Will Save \$18 Million," *The Huffington Post* 23 January, 2014.

so would be better served with a process ready-made for use in smaller headquarters. The commander and higher-ranking principals in this latter case may have the requisite expertise, but placing the success of all staff efforts solely in their very busy hands creates unnecessary risk to planning.<sup>12</sup> Clearly, scaling down CFOPP would be beneficial to both versions of the ATF.

In summary, an AFT commander and staff need the ability to translate strategic aims and overarching campaign objectives into tactical guidance for subordinate elements. Currently, CFOPP is the only tool available to an ATF, a tool which is optimized for use by large organizations such as CJOC. The RCAF professional needs a design and planning tool better suited to the constraints of an ATF.

## **COMPARING DECISION-MAKING TRADITIONS**

In order to modify existing processes, it is useful to review the theoretical underpinnings of doctrine. ADM and NDM represent academic traditions that have epistemological associations with planning and design. In the course of their research for the Office of Naval Research Collaboration and Knowledge Interoperability program, Michael Rosen, Eduardo Salas, Rebecca Lyons and Stephen Fiore provided succinct definition of these traditions:

The classical decision making (CDM) approach of Bernoulli (1738) and others typify the *formal-empiricist* paradigm. Researchers working in this tradition sought to use formal normative models of choice

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<sup>12</sup> Canada. Department of National Defence. B-GJ-005-500/FP-000, *Canadian Forces Joint Publication 5.0, the Canadian Forces Operational Planning Process (CFOPP)* (Ottawa: DND Canada, 2008), 4-3.

between concurrently available options.... The *rationalist* approach... shares many commonalities with its predecessor, the formal-empiricist approach. Whereas the formal-empiricists attempted to adjust their models to account for misalignments with behavioural data, the rationalists counted these deviations from “optimal” normative models as error on the part of the decision maker.... Instead of focusing on normative models of optimization, the *naturalistic* paradigm places the decision maker at the centre of the investigation and seeks to understand how professionals make quality decisions in complex situations where time and other resources are extremely limited.... [NDM has] a focus on what decision makers actually do, a rejection of a conceptualization of decision making as a choice between multiple options....<sup>13</sup>

### **The NDM Tradition**

NDM, a model of decision-making as old as man himself, is a relatively new addition to problem solving at the operational level of war. A bit of background information is required to understand NDM’s advantages and disadvantages and how they could apply to AFOPP. Simply put, the NDM approach addresses decision-making in complex environments. Complex environments are comprised of several series of interacting systems.<sup>14</sup> In trying to impose one’s will on these systems, military operations focus on shifting systems from the current state to a future, preferred state. Making this shift is *the* central problem; this problem is a wicked one, as any solution imposed also changes the system, and thus the very parameters of the original problem.<sup>15</sup>

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<sup>13</sup> Michael A. Rosen et al., "Expertise and Naturalistic Decision Making in Organizations: Mechanisms of Effective Decision Making," in *The Oxford Handbook of Organizational Decision Making*, eds. Gerard P. Hodgkinson and William H. Starbuck, 211-230 (New York: Oxford University Press, 2008), 212-213.

<sup>14</sup> John F. Schmitt, "A Systemic Concept for Operational Design," *Unpublished, Marine Corps Combat Development Command*, [Http://Www.Au.Af.Mil/Au/Awc/Awcgate/Usmc/mcwl\\_schmittCop\\_design.Pdf](http://www.au.af.mil/au/awc/awcgate/usmc/mcwl_schmittCop_design.Pdf), (Accessed February 3, 2009) (2006), 24

<sup>15</sup> *Ibid.*, 8-11.

Famous research psychologist Gary Klein posited that heuristic-based decision-making is more reliable in a wide array of complex situations, though not in all situations.<sup>16</sup> Based on his research, he coined the term Recognition-Primed Decision making (RPD). There have been many other advocates of a NDM approach to problem solving, but the main cross-pollination to the military context came from Brigadier General (retired) Shimon Naveh of the Israeli Defence Forces (IDF).<sup>17</sup> Though no longer accepted doctrine, the IDF developed an approach called Systemic Operational Design (SOD), a systems-based approach that was heavily reliant on RPD concepts. RPD and SOD have engendered much debate in recent years, and in the American context, this debate has born new fruit: *design*.

There are several advantages to design and the NDM tradition. With a more fulsome understanding of the problem space, expert decision makers use intuitive and heuristic approaches to design solutions.<sup>18</sup> These holistic solutions are more comprehensive, can be taken faster, and are more adaptive than solutions born from different decision-making traditions:<sup>19</sup>

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<sup>16</sup>David J. Bryant, "Rethinking OODA: Toward a Modern Cognitive Framework of Command Decision Making," *Military Psychology* 18, no. 3 (2006), 199.

<sup>17</sup> William Sorrells et al., *Systemic Operational Design: An Introduction* (Fort Leavenworth: Unites States Army School for Advanced Military Studies, 2005). 7-8.

<sup>18</sup>Michael A. Rosen et al., "Expertise and Naturalistic Decision Making in Organizations: Mechanisms of Effective Decision Making," in *The Oxford Handbook of Organizational Decision Making*, eds. Gerard P. Hodgkinson and William H. Starbuck), 211-230 (New York: Oxford University Press, 2008), 213.

<sup>19</sup>LCol L. Craig Dalton, "Systemic Operational Design: Epistemological Bumpf Or the Way Ahead for Operational Design?" (Fort Leavenworth, KS: Command and General Staff College, School of Advanced Military Studies, ), 51.; Eugene Sadler-Smith and Paul R. Sparrow, "Intuition in Organizational Decision Making," in *The Oxford Handbook of Organizational Decision Making*, eds. Gerard P. Hodgkinson and William H. Starbuck, 305-324 (New York: Oxford University Press, 2008), 306.; Karol G. Ross et al., "The Recognition-Primed Decision Model," *Military Review* (July-August 2004), 6.

Two key elements that affect the quality of C2 are the commanders' vision, or conceptual model, and the degree to which that vision is shared among individuals and units who will contribute to accomplishing specified goals (Builder et al., 1999). By reference to a shared conceptual model, subordinate commanders can respond to unfolding events in a manner consistent with the overall commander's vision. Sharing the concept also enables subordinate commanders to select and channel upward only information that relates to the continuing effectiveness of the concept.<sup>20</sup>

While the NDM tradition claims to be more comprehensive, quicker and more adaptive than alternatives, it also carries with it certain weaknesses. Heuristic approaches to problem solving are prone to biases, which can "lead to severe and systematic errors."<sup>21</sup> There is also potential for perception errors, "from both noticing and sensemaking [sic]."<sup>22</sup> Furthermore, "people tend to seek data that reinforces their current perceptions," a behavior that can induce further error.<sup>23</sup> Finally, NDM approaches employ complicated terms and concepts. Communicating an understanding of a design to others who may not be well versed in NDM can be problematic, as "...uncertainty and vague language increases confusion among those who are actually at the 'tip of the spear.'"<sup>24</sup>

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<sup>20</sup>David J. Bryant, "Rethinking OODA: Toward a Modern Cognitive Framework of Command Decision Making." *Military Psychology* 18, no. 3 (2006), 190.

<sup>21</sup>Sadler-Smith and Sparrow, *Intuition in Organizational Decision Making*, 305.

<sup>22</sup>John M. Mezas and William H. Starbuck, "Decision Making with Inaccurate, Unreliable Data," in *The Oxford Handbook of Organizational Decision Making*, eds. Gerard P. Hodgkinson and William H. Starbuck, 76-96 (New York: Oxford University Press, 2008), 77-78.

<sup>23</sup>*Ibid.*, 84.; Sadler-Smith and Sparrow, *Intuition in Organizational Decision Making*, 315-319.

<sup>24</sup>Adam Elkus and Crispin Burke, "Operational Design: Promise and Problems," *Small Wars Journal* (2010), 16.

These disadvantages can be mitigated. Team structuring can help to address individual biases and perception errors. Over longer periods, a strong learning organization can identify and rectify any deficiencies in design, marginalizing the impact of any errors or misperceptions.<sup>25</sup> Training can also help to reduce communication errors. Simplifying the concepts imbedded in common doctrine can make NDM approaches more accessible to lay practitioners. With a little work, NDM approaches can deliver significant benefits.

### **The ADM Tradition**

There have been many descriptions of the rationalist, ADM tradition. The previous quotation from Rosen et. al. provides a succinct explanation of the etymology of this tradition. Others have used words like Newtonian, engineering, linear, mechanistic, traditional etc., to characterize this approach.<sup>26</sup> In very simple terms, the ADM approach focuses on deconstructing a problem into its constituent parts, analyzing those parts, and deriving deductions.<sup>27</sup> The deductions are then aggregated into a cohesive plan.<sup>28</sup> In the western military context, this aggregation usually results in multiple options for solving the problem. The practitioner can then compare and contrast options, a process that allegedly results in an optimal solution. It is important to note that ADM approaches are

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<sup>25</sup> Mezias and Starbuck, *Decision Making with Inaccurate, Unreliable Data*, 87.

<sup>26</sup> Dalton, *Systemic Operational Design: Epistemological Bumpf Or the Way Ahead for Operational Design?*, 22.; Elkus and Burke, *Operational Design: Promise and Problems*, 10.

<sup>27</sup> NATO, AJP-5. *Allied Joint Doctrine for Operational-Level Planning* (Brussels: NATO Standardization Agency, 2013), 2-11.

<sup>28</sup> Gary A. Klein, *Sources of Power: How People make Decisions* (Cambridge, Mass.: MIT Press, 1998), 127.

optimal for solving complicated problems vice complex problem sets. A *complex* situation sees multiple interdependencies between systems, and adjusting those systems requires a comprehensive and adaptive design. A *complicated* problem may have lots of moving parts, but detailed planning can generally provide one optimal solution.

There are several benefits to ADM, many of which address the weaknesses found in NDM. A rationalistic approach to planning breaks a problem into “manageable pieces assignable as tasks....”<sup>29</sup> The clarity gained by deconstructing a problem also addresses the communication problem inherent in NDM approaches: planning, by its very nature, provides detailed and “practical” plans.<sup>30</sup> Even in the absence of a deep and nuanced understanding of the problem space, staffs applying a planning process “will produce adequate orders in accordance with their commander’s vision.”<sup>31</sup> An additional advantage is the logical nature of this approach. Comprehensive analysis enables the clear and objective expression of the rationale behind a course of action, rather than relying on a “gut feel” or in the heuristic machinations of a staff.<sup>32</sup> The employment of a well-engineered and rational process is useful beyond just developing a clear, detailed, and manageable plan. Well-structured planning processes are also easy to replicate and are reliable, allowing even novices to “determine what they need to know.”<sup>33</sup> If an ADM-

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<sup>29</sup> John F. Schmitt, "A Systemic Concept for Operational Design," Unpublished, Marine Corps Combat Development Command, [Http://Www.Au.Af.Mil/Au/Awc/Awcgate/Usmc/mcwl\\_schmitCop\\_design.Pdf](http://www.au.af.mil/au/awc/awcgate/usmc/mcwl_schmitCop_design.Pdf), (Accessed February 3, 2009) (2006), 7.

<sup>30</sup> United States Army Combined Arms Centre, ADRP 5-0. the Operations Process (Fort Leavenworth: Combined Arms Doctrine Directorate, United States Army, 2012), 6.

<sup>31</sup> Perez, Lieutenant Colonel Celstino, Jr., "A Practical Guide to Design, A Way to Think about it, and a Way to do It," *Military Review* 91, no. 2 (March-April 2011), 43.

<sup>32</sup> NATO, *AJP-5. Allied Joint Doctrine for Operational-Level Planning*, 2-7.

<sup>33</sup> Klein, *Sources of Power: How People make Decisions*, 29.

based model has some modicum of flexibility, it is applicable to a multitude of situations.<sup>34</sup>

Just as the main strengths of ADM address the weaknesses of NDM, the weaknesses of ADM are closely related to benefits of an NDM approach. ADM approaches are optimized for resolving complicated problems, not for addressing the challenges of complex systems. In the latter case, just framing the problem is one of the largest challenges, and “design becomes essential.”<sup>35</sup> Although there is leeway in ADM for the commander to apply his operational art and design the solution, doing so does not necessarily capture the benefits of the staff’s wider brainpower; if the commander’s vision is inaccurate, incomplete or misinterpreted, subsequent planning may not solve the core problem(s) of a situation. An additional criticism levied against ADM approaches is that they are time-intensive due to the volume of detail considered.<sup>36</sup> If the commander’s operational art did not paint the right picture, time and effort expended in planning can escalate even further.

Biases and errors are also risks to ADM. Whereas NDM approaches seek to mitigate such risks through team structuring and organizational learning, ADM approaches tend to rely on adherence to process.<sup>37</sup> As with NDM, there are ways to mitigate the limitations of ADM approaches. In addition to adherence to process, training

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<sup>34</sup> *Ibid.*

<sup>35</sup> Schmitt, *A Systemic Concept for Operational Design*, 8.

<sup>36</sup> Sorrells et al., *Systemic Operational Design: An Introduction*, 10-11.

<sup>37</sup> Dalton, *Systemic Operational Design: Epistemological Bumpf Or the Way Ahead for Operational Design?*, 6.



and education regarding ADM processes can minimize many biases and other errors.<sup>38</sup>

The experience of practitioners also plays a significant role; those who have mastered a process such as CFOPP can be more flexible in its application, emphasizing certain steps or cutting others as the situation merits. However, those using ADM must be wary of the illusion that detailed analysis will automatically lead to comprehensive solutions; there is a clear requirement for the commander to guide and focus staff analysis based on his experience and on his practice of the operational art.<sup>39</sup>

## **EXISTING DOCTRINE FOR SMALLER HEADQUARTERS**

Having gained a broad understanding of the two main decision-making traditions, discussion can now move on to a review of the existing design and planning doctrines of Canada and her close partners. It is important to reiterate that NDM and ADM approaches compensate for each other's weaknesses. Although the doctrine reviewed in subsequent paragraphs will be partitioned into one or the other tradition for the purposes of clarity, the reality is that there are elements of both approaches in all the doctrine reviewed. While each of the doctrines presented here has something of value to offer, an ATF headquarters remains constrained by a need for shorter staff development times, a reliance on lower experience levels, and a requirement for less resource- and time-

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<sup>38</sup> Klein, *Sources of Power: How People make Decisions*, 29.

<sup>39</sup> Major Mark C. Andres, *Adapting the Doctrinal Discourse on Campaign Planning to the Reality of Current Conflicts* (Fort Leavenworth, KS: School of Advanced Military Studies, 2010), 5.

intensive design and planning approaches. Accordingly, the subsequent pages will focus on what aspects of CFOPP could be retained or cut as AFOPP is developed.

### **NDM Approaches**

On the NDM side, American joint doctrine explicitly advocates design. The opening stages of problem solving involve the application of *Operational Art*. This art sets the stage for later detailed planning. During the art phase, there is a distinction made between developing an operational approach and carrying out design. The former analyzes the environment, and then the commander provides his “visualization of a broad approach for achieving the desired end state....”<sup>40</sup> In the latter, design “employs various elements to develop and refine the commander’s operational approach. These elements include planning for termination, military end state, objectives, friendly goals, effects (in terms of systems), Centre of Gravity (CoG), decisive points, Lines of Operation, Lines of Effort, direct and indirect approach, anticipation, operational reach, and culmination.”<sup>41</sup>

The U.S. Army’s ADRP 5-0 provides a more succinct capture of design methodology:

Army Design Methodology is a methodology for applying critical and creative thinking to understand, visualize, and describe problems and approaches to solving them (ADP 5-0). Army design methodology is particularly useful as an aide to conceptual planning, but must be integrated with detailed planning typically associated with the MDMP to produce executable plans. Key concepts that underline the Army design methodology include:

- Critical and creative thinking....

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<sup>40</sup> Joint Chiefs of Staff, Joint Publication 5-0 (Washington, D.C.: Government Printing office, 2011), III-13

<sup>41</sup> *Ibid.*, III-18 to III-34.

- Collaboration and dialogue....
- Framing.
- Narrative construction.
- Visual modeling.<sup>42</sup>

This NDM tradition has been adopted beyond Joint and Army doctrine, with the Marine Corps also incorporating aspects of design into their operational planning process. They emphasize “problem framing” as the core activity, subsuming what was formally “mission analysis.”<sup>43</sup> The Marines have even gone so far as to assert, “It [design] is appropriate to problem solving at the strategic, operational and tactical levels of war.”<sup>44</sup>

Design is an expansive topic, and its proper application requires education, training and experience.<sup>45</sup> Given the constraints faced by a smaller headquarters, what, then, are the most valuable aspects of design? Revisiting the basic understanding of NDM, the main advantages were an ability to understand complexity, the ability to design comprehensive solutions, the adaptability of this form of decision-making, and the speed of decision-making. Looking at the five concepts underlying Army design methodology, framing quickly emerges as one of the most powerful activities:

Framing is the act of building mental models to help individuals understand situations and respond to events. Framing involves selecting, organizing, interpreting, and making sense of an operational environment and a problem by establishing context. How individuals or groups frame a problem will influence potential solutions. For example, an organization that frames an insurgent group as “freedom fighters” will approach solving

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<sup>42</sup> United States Army Combined Arms Centre, ADRP 5-0. The Operations Process, 2-4 to 2-5.

<sup>43</sup> United States. Department of the Navy. MCWP 5-1, Marine Corps Planning Process (Washington, D.C.: Headquarters United States Marine Corps, 2010), Forward.

<sup>44</sup> *Ibid.*, 1-4.

<sup>45</sup> Sorrells et al., *Systemic Operational Design: An Introduction*, 36, 39.

in a conflict differently from an organization that frames insurgent groups as “terrorists.”<sup>46</sup>

Narrative construction is presented as equally powerful, but as it involves the nuanced construction of a story, it is likely a more difficult skill to develop.<sup>47</sup> Visual modeling is also powerful, but it is unlikely that a smaller headquarters will have the capacity to build much more than rudimentary visual representations. Furthermore, there are common visual models already in service with most countries, e.g. campaign plan graphics; it may be wiser to rely on the simple templates already in service. As for critical thinking, collaboration, and dialogue, the likelihood of short ATF development timelines make anything more than a rudimentary introduction of these activities unrealistic.

Unlike the other design elements, framing is presented as a simple process. Lieutenant Colonel Perez, an instructor at the U.S. Army Command and General Staff College, suggests that all one really needs to do is answer four central questions about the problem: what is the current environment; what is the desired environment; what are the conceptual actions tied to success; and what is the operational approach (way) that will best achieve success?<sup>48</sup> While there would certainly be some loss in omitting other design concepts, framing captures the core advantages of NDM: an ability to understand complexity, the ability to design comprehensive solutions, adaptive decision making, adaptive solutions, and rapid decision-making. Indeed, in the Marine Corps planning

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<sup>46</sup> United States Army Combined Arms Centre, *ADRP 5-0. the Operations Process*, 2-5.

<sup>47</sup> Perez, Lieutenant Colonel Celstino, Jr., *A Practical Guide to Design, A Way to Think about it, and a Way to do It*, 47.

<sup>48</sup> *Ibid.*, 44.

process, framing is the first of the six major steps.<sup>49</sup> In the development of AFOPP, there is certainly a strong argument for the inclusion of framing in any future research.

### **ADM Approaches**

The remaining doctrine is not based solely in the ADM tradition, but ADM emerges as the dominant approach. This should come as no surprise to the military practitioner, as ADM has been the traditional approach amongst western militaries for quite some time.<sup>50</sup> While American Joint, Army and Marine doctrine emphasizes design as a critical first activity, the same doctrine still places a heavy emphasis on rational planning. American Joint doctrine explicitly refers to this as the Joint Operations Planning Process (JOPP).<sup>51</sup> This is comprised of seven steps: planning initiation; mission analysis; course of action (COA) development; COA analysis and wargaming; COA comparison; COA approval; and plan or order development.<sup>52</sup> In simple terms, JOPP takes the commander's design and translates it into an actionable plan. The Army is similar, using a process called the Military Decisionmaking<sup>53</sup> Process (MDMP):

The military decisionmaking process (MDMP) integrates the activities of the commander, staff, subordinate headquarters, and unified action partners to understand the situation and mission; develop and compare courses of action; decide on a course of action that best accomplishes the mission; and produce an operation plan or order for execution. The MDMP helps leaders apply thoroughness, clarity, sound

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<sup>49</sup> United States. Department of the Navy. MCWP 5-1, *Marine Corps Planning Process*, 1-1.

<sup>50</sup> Major G. W. Ivey, "Systemic Operational Design: A Viable Alternative to the Canadian Forces Operational Planning Process" (Joint Command and Staff Program, Canadian Forces College, 2010), 51-58.

<sup>51</sup> Joint Chiefs of Staff, *Joint Publication 5-0*, IV-1.

<sup>52</sup> *Ibid.*, IV-2.

<sup>53</sup> Though counter-intuitive, "decisionmaking," is the spelling used in ADRP 5-0.

judgment, logic, and professional knowledge to understand situations, develop options to solve problems, and reach decisions.<sup>54</sup>

MDMP's seven steps are virtually identical to those of JOPP.<sup>55</sup> The Marine Corps process follows a similar structure: Problem Framing; COA Development; COA Wargaming; COA Comparison and Decision; Orders Development; and Transition.<sup>56</sup>

CFOPP is slightly different from the American format and consists of five stages: Initiation, Orientation, COA development, Plan Development, and Plan Review.<sup>57</sup> The largest difference is in Stage 2, Orientation. Stage 2 incorporates mission analysis, and this is also where the meat of campaign design occurs. However, it can be argued that the Canadian process does not approach this activity in the purest sense of design; critics have asserted that Canadians treat this activity as a linear, step-based *planning* process vice an NDM, artistic undertaking.<sup>58</sup> The remaining steps are not substantially different from American doctrine, and the detailed attention to the subordinate processes within each step reinforces the ADM nature of the Canadian planning tool.<sup>59</sup>

The UK approach to campaign design and operational planning is similar to CFOPP. Although it sees operations as nesting within broader campaigns, the Joint Force Commander and staff use the Operational Estimate process to develop both a campaign

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<sup>54</sup> United States Army Combined Arms Centre, *ADRP 5-0. the Operations Process*, 2-11.

<sup>55</sup> *Ibid.*, 2-12.

<sup>56</sup> United States. Department of the Navy. MCWP 5-1, *Marine Corps Planning Process*, 1-5.

<sup>57</sup> Canada. Department of National Defence. B-GJ-005-500/FP-000, *Canadian Forces Joint Publication 5.0, the Canadian Forces Operational Planning Process (CFOPP)*, 4-1.

<sup>58</sup> Dalton, *Systemic Operational Design: Epistemological Bump Or the Way Ahead for Operational Design?*, 22.

<sup>59</sup> Canada. Department of National Defence. B-GJ-005-500/FP-000, *Canadian Forces Joint Publication 5.0, the Canadian Forces Operational Planning Process (CFOPP)*, Chapter 4.

design and operational plan.<sup>60</sup> It consists of five familiar steps: “Understand the operational environment”, “Understand the problem”, “Formulate potential COA”, “Develop and validate COA”, and “Evaluate COAs.”<sup>61</sup> There are two main differences from CFOPP. First, Step 1 aims at “framing the problem,” and advocates a more design-like approach to understanding the operating environment.<sup>62</sup> Second, the remainder of the process appears to be less proscriptive than CFOPP, offering, perhaps, a better balance between ADM and NDM approaches.<sup>63</sup>

The Australians’ approach to Joint Operations Planning is roughly the same as the preceding ADM approaches. The overarching process includes: “Preliminary Scoping”, “Joint Intelligence Preparation of the Battlespace”, “The Joint Military Appreciation Process”, and “Plan Development and Execution.”<sup>64</sup> Preliminary Scoping is similar in character to the Initiation Stage of the Canadian process, with only some small exceptions.<sup>65</sup> The remainder of the Joint Military Appreciation Process is comprised of “Mission Analysis”, “COA Development”, “COA Analysis”, and “Decision and Concept of Operations Development.”<sup>66</sup> The main difference is the blending of what Canadians would consider a campaign plan and COAs; while multiple COAs are still possible, they are described both using the traditional terms Canadians would expect, and using the

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<sup>60</sup> United Kingdom. Ministry of Defence. Director Concepts and Doctrine. JDP 5-00., Joint Doctrine Publication 5-00, Campaign Planning, 2nd ed. (Shirvenham: MOD, 2013), 2-11, 2-14, 2-32

<sup>61</sup> *Ibid.*, 2-36 fig. 2.9.

<sup>62</sup> *Ibid.*, 2-41.

<sup>63</sup> *Ibid.*, Chapter 2.

<sup>64</sup> Australian Defence Force. ADFP 5.0.1, Joint Military Appreciation Process (Canberra: Defence Publishing Service, 2009), 1-10 to 1-13.

<sup>65</sup> *Ibid.*, 2-2, 2-7.

<sup>66</sup> *Ibid.*, 1-11, 1-12.

terms a Canadian practitioner would expect to see in a Campaign plan, such as decisive points and lines of operation.<sup>67</sup>

As NATO doctrine must be able to function in concert with the doctrine of its constituent nations, it should come as no surprise that there are strong similarities between the NATO Operational-Level Planning Process (OLPP) and CFOPP:

The OLPP consists of the necessary steps to support a JFC and his staff in order to develop the operational-level operation plan (OPLAN) including the conduct of the operational estimate process. The steps also comprise the campaign and operational assessment during execution in order to review or revise the plan, when required. These OLPP steps are:

- a) Step 1 – Initiation of the OLPP.
- b) Step 2 – Problem and Mission Analysis.
- c) Step 3 – Course of Action (COA) development.
- d) Step 4 – COA Analysis.
- e) Step 5 – COA validation and comparison.
- f) Step 6 – Commander’s COA decision.
- g) Step 7 – Operational-level concept of operations (CONOPS) and plan development.<sup>68</sup>

The NATO approach differs slightly from the Canadian approach by shifting some supporting processes to different stages.<sup>69</sup> Like Stage 2 of CFOPP, the NATO approach undertakes the most design-like processes during mission analysis.<sup>70</sup> In a broad sense, NATO doctrine, CFOPP and the doctrine of Canada’s other close allies exhibit the benefits expected of ADM approaches, namely they provide clarity, detail, and are replicable with lower experience levels. However, the lack of substantial difference

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<sup>67</sup> *Ibid.*, 5-5 to 5-18.

<sup>68</sup> NATO, *AJP-5. Allied Joint Doctrine for Operational-Level Planning*, 3-1.

<sup>69</sup> *Ibid.*, 3-6 to 3-11.

<sup>70</sup> *Ibid.*, 3-14, 3-18.



between ADM approaches means there are no significant clues as to what steps would be more beneficial for inclusion in AFOPP.

### **CFOPP TO AFOPP**

Having reviewed both the ADM and NDM sides of existing doctrine, the question regarding what elements are value-added for a smaller headquarters needs to be revisited. In the NDM tradition, framing stands out as valuable. On the ADM side, there are no supporting steps in existing planning processes that stick out as more valuable than the others. Thus, the question becomes for the ADM side, where can risk be accepted in shaving down CFOPP?

From an NDM perspective, it is clear that framing should be included at the outset of AFOPP. In the circumstances where an ATF integrates tightly into a higher campaign plan, staff could truncate framing, focusing this stage on a closer review of the superior commander's guidance. When it has more independence, however, the ATF would benefit from a fulsome application of framing. There is no reason against conducting this activity in parallel with the activities of Stage 1, Initiation. This would also alleviate some pressure from Stage 2, Orientation. The "Review of the Situation" and "Review of the Higher Level" steps in Stage 2 could move into framing, so long as any resulting constraints, restraints and tasks are still captured for Stage 3 analysis.<sup>71</sup> Problem framing could also incorporate many of the other Stage 2 activities related to developing one's

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<sup>71</sup> Canada. Department of National Defence. B-GJ-005-500/FP-000, *Canadian Forces Joint Publication 5.0, the Canadian Forces Operational Planning Process (CFOPP)*, 4-8.

own operational understanding, less some of the more process-oriented, technical steps such as “Key Strengths and Weaknesses”, “Assess Risk,” or “Planning Guidance.”<sup>72</sup>

In Stage 3, the “Staff Analysis” of factors speaks directly to the core ADM advantages of clarity and detail.<sup>73</sup> As such, this step should be emphasized; close examination of the details helps to uncover considerations that are critical to developing a *feasible* design and plan, while also helping practitioners gain a *fulsome understanding* of the situation.<sup>74</sup> Furthermore, detailed factors analysis is a valuable activity for less experienced decision makers.<sup>75</sup> COA development is the next step in Stage 3, and it is one of the more time- and labour-intensive steps. The development of multiple friendly COAs does not actually achieve ADM benefits. While developing multiple COAs can assist practitioners in learning more about the broad situation, doing so does not offer a true choice between alternative futures, as all COAs are ultimately fathered by the same broad design. The development of only one COA is likely a better investment of effort, especially if time is allowed for multiple iterations of COA testing and modification.<sup>76</sup> Indeed, the U.S. Army approach for planning under time pressure recommends developing only a single friendly COA.<sup>77</sup> Regarding opponent COAs, most existing doctrine advocates at least developing a most dangerous and most likely COA for

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<sup>72</sup> *Ibid.*, 4-4.

<sup>73</sup> *Ibid.*, 4-8 to 4-9.

<sup>74</sup> United States. Department of the Navy. MCWP 5-1, *Marine Corps Planning Process*, 2-4.; NATO, AJP-5. *Allied Joint Doctrine for Operational-Level Planning*, 3-32.; Klein, *Sources of Power: How People make Decisions*, 144.

<sup>75</sup> *Ibid.*, 29.

<sup>76</sup> Ross et al., *The Recognition-Primed Decision Model*, 7, 8.

<sup>77</sup> United States Army Combined Arms Centre, ADRP 5-0. *The Operations Process*, 4-6.

comparison against blue actions.<sup>78</sup> There is nothing in existing literature that suggests it would be acceptable to eliminate these two opponent COAs, and these COAs remain useful for wargaming.

Wargaming can mitigate the planning risk associated with focusing on a sole friendly COA. Each country heavily emphasizes wargaming. NATO doctrine succinctly captures wargaming's value:

It [wargaming] should be used, whenever time permits, in order to evaluate the potential of the COA to accomplish the mission against foreseen opposition with respect to the different opposing COAs as well as to identify and correct deficiencies. However, the real value is its ability to permit the JFC and his staff to visualize the conduct of operations and gain insight into opposing capabilities and actions, as well as conditions in the operational environment. Wargaming should help them anticipate possible events and foster the mental agility to deal with them. The war game should also help identify potential risks and opportunities....<sup>79</sup>

The remainder of CFOPP, namely approving a COA and then moving onto Plan Development, would be difficult to shrink much further. These processes see the translation of the broader operational approach and the more detailed COA into the functional and technically detailed planning processes that drive execution, such as targeting, development of Airspace Control Orders, development of synchronization matrices, development of Air Tasking Orders, etc.<sup>80</sup> However, one more value-added

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<sup>78</sup> Joint Chiefs of Staff, *Joint Publication 5-0*, IV-30.; Canada. Department of National Defence. B-GJ-005-500/FP-000, *Canadian Forces Joint Publication 5.0, the Canadian Forces Operational Planning Process (CFOPP)*, 4-10.; Australian Defence Force. ADFP 5.0.1, *Joint Military Appreciation Process*, 6-3.; United States. Department of the Navy. MCWP 5-1, *Marine Corps Planning Process*, 4-1.; United Kingdom. Ministry of Defence. Director Concepts and Doctrine. JDP 5-00., *Joint Doctrine Publication 5-00, Campaign Planning*, 2I1-1.

<sup>79</sup> NATO, *AJP-5. Allied Joint Doctrine for Operational-Level Planning*, 3-32.

<sup>80</sup> Canada. Department of National Defence. B-GA-400-000/FP-000, *Canadian Forces Aerospace Doctrine*, 43-45.

practice appears in both American and UK doctrine that offers significant promise. Red teaming is an organizational stratagem for ensuring the development of well-rounded designs and plans.<sup>81</sup> Though traditionally viewed as the purview of intelligence staff, there is value in breaking this stratagem out from the intelligence function. In this latter structure, a team apart from the main planning staff and intelligence staff challenges thinking from more than just the enemy perspective:

Red teaming provides an independent capability to fully explore alternatives in plans and operations in the context of the operational environment and from the perspective of adversaries and others.... Commanders use red teams to aid them and their staffs to provide insights and alternatives during design, planning, execution and assessment to:

- a) Broaden the understanding of the operational environment;
- b) Assist the commander and staff in framing problems and defining end state conditions;
- c) Challenge assumptions;
- d) Consider the perspectives of the adversary and others as appropriate;
- e) Aid in identifying friendly and enemy vulnerabilities and opportunities;
- f) Assist in identifying areas for assessment as well as the assessment metrics;
- g) Anticipate the cultural perceptions of partners, adversaries and others; and
- h) Conduct independent critical reviews and analyses of plans to identify potential weaknesses and vulnerabilities.<sup>82</sup>

The disruptive thinking of a red team could be applied throughout design and planning. Using a small team within an ATF could potentially mitigate the risks of scaling down CFOPP. Red teaming is certainly an addition meriting further consideration in the development of AFOPP.

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<sup>81</sup> Joint Chiefs of Staff, *Joint Publication 5-0*, III-5.; United Kingdom. Ministry of Defence. Director Concepts and Doctrine. JDP 5-00., *Joint Doctrine Publication 5-00, Campaign Planning*, 2I-2.

<sup>82</sup> Joint Chiefs of Staff, *Joint Publication 5-0*, III-5.

## CONCLUSION

While CFOPP is not optimized for use in a smaller headquarters, a modified version, which incorporates the four recommended changes, would result in an AFOPP tool that would conform to ATF constraints while maximizing the benefits of both the NDM and ADM traditions. While an ATF assembled from 2 AEW will have more time for professional development, the size of staff directly supporting the commander will be smaller than that found in a headquarters such as CJOC. This is a major factor driving the need for modifications to CFOPP. Further to size considerations, temporary ATFs constructed on an iterative basis to fulfill AF high readiness commitments will have fewer opportunities to develop mastery regarding their design and planning tools. Accordingly, CFOPP should be adjusted to: minimize prerequisite experience and staff developmental time; minimize the time, resources and effort expended in employment of a design and planning tool; and emphasize the most valuable aspects of existing design and planning processes.

Placing *framing* at the commencement of the design and planning process would increase the effectiveness of AFOPP. Investing in framing would also provide an opportunity to cut several supporting steps from Stage 2 of CFOPP. Increasing emphasis on factor analysis while reducing COA development to one friendly COA would serve to emphasize value-added activities while also finding efficiencies. Investing in wargaming would further reduce planning risk while developing fulsome understanding of the problem space. The retention of steps that translate the design and a COA into actionable plans remains important; the addition of red teaming could further enhance Stages 4 and

5 while also adding value to the rest of AFOPP. All of these changes should be adopted with an eye to also minimizing both the complexity and time of staff training.

These recommendations also serve to maximize the benefits of both the NDM and ADM traditions. From the NDM side, AFOPP could be more comprehensive, faster and adaptive. The retention of many elements of CFOPP would keep the main benefits of ADM approaches, namely: clarity, detail, replicability, and simplicity of use for inexperienced practitioners. In pulling from both NDM and ADM, the strengths of each tradition mitigate each other's weaknesses. As the RCAF reaches a place where it is capable of deploying airpower into a wide variety of scenarios, the RCAF professional would be well served by a modified form of CFOPP. For future research and development regarding AFOPP, the four recommendations of this paper and a balanced application of ADM and NDM approaches would be excellent places to start.

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