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AWAKENING THE SENSES: PROFESSIONALIZATION OF THE RCAF INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE ENTERPRISE

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AIM

1. The purpose of this paper is to provide a recommendation to the institutional leaders of the Royal Canadian Air Force (RCAF) to promote the professionalization of the Intelligence, Surveillance, and Reconnaissance (ISR) enterprise by way of adopting a tiered ISR training and education program. Given that the Canadian Armed Forces (CAF) will introduce a variety of new aerospace platforms, sensors, and communications capabilities in the coming years, it is incumbent upon the RCAF to adopt a proactive role in preparing the future ISR workforce with the requisite levels of professional skills to succeed within the joint all-domain environment.

INTRODUCTION

2. The RCAF must build a professional ISR workforce that exemplifies the necessary knowledge and skills to prepare for the impending arrival of new aerospace systems and enhanced technologies. The introduction of highly-advanced ISR capabilities such as armed remotely piloted aircraft systems (RPAS), sensor-rich next-generation aircraft, and space-based systems will require the synchronization of all phases of the ISR cycle – direction, collection, processing, and dissemination – with the air tasking cycle to enable their effective employment.[1] An impending 'awakening' of the aerospace sense function will emphasize the need to reimagine the existing application of ISR concepts from the current platform-centric focus to one that emphasizes a command-led 'systems-of-systems' approach enabled by an interconnected system of personnel across a multitude of disciplines and functions.[2] The key enabler to executing these processes will be a highly competent workforce of RCAF officers, non-commissioned members (NCMs), and civilians employed within the ISR enterprise in a variety of roles across all ISR disciplines.[3] To accomplish this ends, the workforce will require specialized training programs to provide the requisite level of skills and knowledge needed to perform their assigned functions.

3. The most recent update of *RCAF Vectors* highlights the need to become a learning organization that is "committed to ensuring that all RCAF team members are highly skilled, competent, and well-training professionals in the respective fields."[4] Although the RCAF operates several training establishments and operational training units across the country to deliver "advanced aerospace knowledge and leading-edge training," there is a distinct absence of specialized ISR training.[5] Consequently, the lack of training has created an acute deficiency of professional knowledge and skills, resulting in the mismanagement of processes and lack of

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[1] Department of National Defence, B-GA-401-002/FP-001, *Royal Canadian Air Force Doctrine – Intelligence, Surveillance and Reconnaissance* (Trenton: Canadian Forces Aerospace Warfare Centre, 2017), 8.

[2] The conduct of ISR is platform agnostic, whereby mission are planned and executed using a system of sensors, communications networks, processing capacities, and a dedicated professional workforce.

[3] RCAF ISR Doctrine indicates that the four disciplines of ISR are Command and Control, Planning and Operations, Collection, and Intelligence.

[4] Department of National Defence, A-GA-007-000/AF-008*, RCAF Vectors* (Trenton: Canadian Forces Aerospace Warfare Centre, 2019) 48.

[5] Royal Canadian Air Force, "2 Canadian Air Division," last modified 7 August 2020, https://www.rcaf-arc.forces.gc.ca/en/2cdnairdiv/index.page

purpose with the ISR enterprise.[6] Moreover, despite the publication of the initial *RCAF Sense Doctrine* in 2012 and the release of successive spirals of the *1 Canadian Air Division (1 CAD) ISR Directive* since 2015, the RCAF remains incapable of planning and executing ISR operations per the defined processes shared with joint and allied partners.[7] To correct these substantial deficiencies and to prepare for impending growth of the ISR enterprise, the implementation of a training program to professionalize the workforce will enable the RCAF "to provide the CAF with relevant, responsive and effective air and space power to meet the defence challenges of today and into the future."[8]

DISCUSSION

The ISR Enterprise: Equipment, Processes, People

4. The ISR enterprise exists as an amalgamation of interdependent elements consisting of technologically relevant equipment, operationally agile processes, and a wide range of skilled people.[9] When effectively combined, these elements generate the necessary synergy that enables ISR to achieve its purpose of "contributing directly to decision superiority, providing commanders and decision-makers with timely and relevant information that supports the building of common and shared knowledge and understanding of the operational environment."[10] The interaction between each of the enterprise elements must remain in equilibrium; a dramatic change of any single element must be met with an appropriate response to maintain balance. Today's RCAF ISR enterprise suffers from a persistent imbalance stemming from the absence of critical equipment and a dearth of skilled and knowledgeable personnel. This has led to the deliberate disregard of doctrinal processes underpinning the challenges meeting CAF joint and coalition ISR requirements.[11] With the impending increase in the quantity and complexity of aerospace systems, the ISR enterprise must meet the growing demands for all domain information superiority within the increasingly complex operating environments.[12]

5. **Equipment.** A primary factor driving the requirement to professional the ISR enterprise is the quantity of aerospace equipment systems that will be successively integrated into the Air Campaign.[13] Currently, the CAF operates only a limited amount of airborne collection systems, with the multi-mission CP-140M AURORA long-range patrol aircraft serving as the only

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[6] L.M. Baspaly, *Record of Discussion – CAOC ISR Tasking Process Rehearsal of Concept Drill 26 June 2014* (1 Canadian Air Division HQ: file 1001-1 (A2 Ops), 13 July 2014), 1-2.

[7] Notably, the 1 CAD Combined Aerospace Operations Centre neither centralizes the control of ISR operations nor has members assigned within its various organizational divisions conducting core ISR cycle planning and execution functions.

[8] Department of National Defence, A-GA-007-000/AF-008, *RCAF Vectors*, iv.

[9] J.H.C. Drouin, *1 Canadian Air Division Intelligence, Surveillance, and Reconnaissance Directive – Spiral Three* (1 Canadian Air Division HQ: file 2003-2 (A2), 10 May 2019), 1.

[10] Department of National Defence, B-GA-401-002/FP-001, *Royal Canadian Air Force Doctrine – Intelligence, Surveillance and Reconnaissance*, iv.

[11] Baspaly, Record of Discussion – CAOC ISR Tasking Process Rehearsal of Concept . . ., 1.

[12] Department of National Defence, *Strong, Secure, Engaged – Canada's Defence Policy* (Ottawa: Canada Communications Group, 2017), 51.

[13] The RCAF defines the Air Campaign as the principal means by which air operations are synchronized with, and contribute to, the joint campaign.

dedicated ISR platform.[14] Although the AURORA has proven to be a flexible and capable multi-sensor platform, its application remains restricted due to the limited ability to transmit near-real-time sensor data to ground-based processing, exploitation, and dissemination (PED) nodes.[15] Rounding out the remainder of the enterprise are various other airborne systems categorized as non-traditional ISR (NTISR) capabilities that can perform a reduced scope of missions on an *as-required* basis.[16] An example of this type of capability includes the CF-188A HORNET equipped with the Sniper Advanced Targeting Pod, which was employed extensively in NTISR roles during Operation MOBILE and Operation IMPACT.[17] Consequently, due to the enterprise's current equipment limitations, efforts to integrate the ISR cycle and the core ISR doctrinal processes into 1 CAD Combined Aerospace Operations Centre (CAOC) doctrinal processes have remained futile.[18]

6. Nevertheless, Canada's aerospace ISR equipment capabilities will expand significantly over the coming years. Of the thirteen identified RCAF investments included within *Strong, Secured, Engaged: Canada's Defence Policy* (SSE), all will contribute directly or indirectly to the ISR enterprise.[19] SSE highlights that "every RCAF platform, be it piloted, remotely piloted or space-based, also acts as a sensor, ensuring that information and intelligence gets to decision-makers in a timely fashion."[20] The procurement of a range of purpose-built primary ISR platforms such as the crewed Multi-Mission Aircraft (MMA), RPAS, and the space-based RADARSAT replacement will depend on the centralized control and decentralized execution of the CAOC to integrate the ISR enterprise into joint and coalition processes.[21] Moreover, to achieve the RCAF's aspiration of enabling all air platforms to perform data collection functions, sensors aboard the CC-295 KINGFISHER fixed-wing search and rescue aircraft, the CH-148 CYCLONE maritime helicopter, the Manned Airborne ISR (MAISR) special operations forces platform, the Future Fighter Capability Project, and others will be integrated into the ISR cycle to maximize their contributions to the Air Campaign.

7. **Processes.** Aerospace operations must be properly planned, coordinated, executed, and assessed to achieve the overarching tenant of centralized control and decentralized execution.[22] Within the RCAF, the CAOC will become the focal point for the management and synchronization of the ISR and air tasking cycles to provide the necessary "seamless integration" with overarching CAF joint ISR processes.[23] To accomplish this ends, ISR doctrinal processes leverage the organizational structure of the CAOC by assigning various roles to the Strategy Division (SD), Combat Plans Division (CPD), Combat Operations Division (COD), and the ISR

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[14] Drouin, 1 Canadian Air Division Intelligence, Surveillance, and Reconnaissance Directive . . ., 2.

[15] Bradley Adams, *Exercise Maple Resolve 1601 After Action Report*, Winnipeg: 1 Canadian Air Division A2 Directorate, 27 July 2016, 1-2.

[16] Drouin, *1 Canadian Air Division Intelligence, Surveillance, and Reconnaissance Directive* . . ., 2.

[17] Chris Thatcher, "RCAF Working Toward New Sniper Pod Replacement on CF-188 Hornet," Skies Magazine, 10 May 2018, https://skiesmag.com/news/rcaf-planning-new-sniper-pod-placement-cf-188-hornet/.

[18] Baspaly, *Record of Discussion – CAOC ISR Tasking Process Rehearsal of Concept Drill* . . ., 1-2.

[19] Department of National Defence, *Strong, Secure, Engaged – Canada's Defence Policy*, 39.

[20] *Ibid*., 38.

[21] Department of National Defence, B-GA-401-002/FP-001, *Royal Canadian Air Force Doctrine – Intelligence, Surveillance and Reconnaissance*, 31.

[22] Department of National Defence, B-GA-400/FP-001, *Canadian Armed Forces Air Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre, 2016), 16.

[23] Department of National Defence, *Strong, Secure, Engaged – Canada's Defence Policy*, 39.

Division (ISRD). The SD will be responsible for developing, refining, disseminating and assessing the aerospace component ISR strategy, leading Joint Operational Planning Processes, and producing the Air Operations Directive.[24] The CPD will develop the Master Air Operations Plan, which in turn drives the creation of the Air Tasking Order and Airspace Control Order. [25] The COD will direct, execute, and monitor ISR missions and perform dynamic collections operations, ISR battle management, and time-sensitive targeting.[26] Supporting all CAOC divisions throughout, the ISRD's primary function will be to conduct collection requirements management, synchronizing sensor data processing, exploitation and dissemination, and providing the Reconnaissance, Surveillance, and Target Acquisition annex to the ATO.[27] The individual role of each CAOC division is critical to the successful conduct of ISR operations whereby adherence to defined processes and procedures constitutes the essential ingredients for success. Consequently, the ISR enterprise's success will be directly linked to the purposeful application of doctrinally-aligned processes to meet the increasing requirements for interoperability with its key partners and core allies across all domains.[28]

8. **People.** The most valuable component of the RCAF enterprise is the people, unified by a common purpose and shared culture.[29] While technological advances continue to influence the methods by which aerospace power capabilities interact with the operational environment, "the cognitive abilities of trained personnel throughout its processes" will remain vital to operational success.[30] With the pending increase in personnel employed within the ISR enterprise, the workforce must be empowered by shared common knowledge and skillsets to promote a culture of professionalism and accountability.[31] In the process of preparing for new ISR capabilities, the Royal Australian Air Force (RAAF) warned that "the human dimension of ISR capability management is a complex long-term issue that is often underestimated or poorly quantified in developing and managing ISR capability," which underscores the importance of prioritizing the role of people within the enterprise.[32] RCAF personnel assigned to all levels of the organization must be employed to maximize their contribution to the collective accomplishment of the Air Campaign. Planners, operators, and supporters must embrace a systems-of-systems approach understanding of their contribution to the overall joint all domain environment.[33] Functional disconnect at any level will shunt the quality of the RCAF's ability to project aerospace power and inevitably lead to mission failure.

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[24] Department of the Air Force, *Operational Procedures - Air Operations Center*, Air Force Instruction 13-1 AOC, Vol. 3 (Washington, D.C.: Secretary of the Air Force, 2019), 25.

[25] Department of National Defence, B-GA-401-002/FP-001, *Royal Canadian Air Force Doctrine – Intelligence, Surveillance and Reconnaissance*, 30.

[26] *Ibid*.

[27] *Ibid*.

[28] Department of National Defence, *Strong, Secure, Engaged – Canada's Defence Policy*, 39.

[29] Department of National Defence, A-GA-007-000/AF-008, *RCAF Vectors*, 1.

[30] Department of National Defence, B-GA-401-002/FP-001, *Royal Canadian Air Force Doctrine – Intelligence, Surveillance and Reconnaissance*, 14.

[31] 1 Canadian Air Division, *Concept of Operations – Remotely Piloted Aircraft Systems – Version 2.0: Draft* (RCAF Project: C.001035, 3 September 2020), 8.

[32] Royal Australia Air Force, AAP 1001.3, *The Air Force Approach to ISR* (Canberra: Air Power Development Centre, 2011), 37.

[33] Department of National Defence, *Strong, Secure, Engaged – Canada's Defence Policy*, 39.

Training and Education

9. As a modern, proficient military force, it is incumbent upon the RCAF to provide its personnel with the appropriate level of training and education to perform their assigned functions within the profession of arms.[34] The most recent version of *RCAF Vectors*, updated to reflect SSE commitments, highlights that "the RCAF is committed to ensuring that all members of the team are highly skilled, competent and well-trained professionals in their respective fields."[35] As more aerospace ISR capabilities successively integrate into the CAF, the responsibility for optimizing the employment of these high-demand, low-density resources will require functional knowledge. To accomplish this ends, personnel "need the right level of training and education to operate effectively from the tactical to the strategic level."[36] Taking lessons learned from the rapid expansion of the Royal Air Force's (RAF) ISR enterprise, the RAAF identified that the critical requirement for training and education is to achieve a combination of technical and professional mastery;

> While ISR professionals should possess technical mastery in both what ISR is and how to conduct it, they also require professional mastery in integrating Air Force ISR successfully into air power and thus the joint force, agencies, other government organizations and coalition partners. For ISR professionals, formal ISR training in the many ISR disciplines should be a continuing process, progressing through the basic, intermediate and advanced levels. This will ensure ISR professionals possess the professional mastery that will allow them to execute, lead, and manage the Air Force ISR enterprise when combined with ISR technical mastery.[37]

To provide the requisite level of knowledge commensurate with role and function within the ISR enterprise, the RCAF should pursue the creation of a formalized tiered training program to address current and future requirements.[38] Such an approach will ensure that the optimal level of relevant knowledge and skills is provided to all personnel, thus promoting the enterprise's overall professionalization while also stimulating a culture of ISR within the RCAF.

10. Many of the RCAF's closest aerospace allies, notably the United States Air Force (USAF), the RAF, and the RAAF, have professionalized their respective ISR enterprises by providing their personnel with a range of ISR training and education courses. These nations' training programs are tailored to meet the professional requirements of officer, NCM, and civilian personnel assigned to various roles including commanders, planners, operators, and support staff from a wide range of occupations at all levels. To centralize and standardize efforts, dedicated ISR training establishments are used to meet their respective forces' required training and education requirements. Specifically, 54 Training Squadron within 1 ISR Wing at RAF Waddington delivers a range of instruction from an introductory common one-week-long course

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[34] Department of National Defence, *Duty With Honour: The Profession of Arms In Canada* (Ottawa: Queen's Printer, 2009), 17-18.

[35] Department of National Defence, A-GA-007-000/AF-008, *RCAF Vectors*, 48.

[36] *Ibid*., A-64.

[37] Royal Australia Air Force, AAP 1001.3, *The Air Force Approach to ISR*, 67-68.

[38] *Ibid*., 68.

to an expert six-month-long Qualified Weapons Instructor 'QWI' program.[39] Similarly, the USAF delivers a variety of basic and intermediate level ISR courses at the 313th Training Squadron at Goodfellow Air Force Base.[40] Furthermore, the USAF Weapons School offers an advanced six-month-long programs for select ISR enterprise personnel "to serve as unit weapons and tactics officers, leading combat missions and providing senior leaders and decision makers tactical, operational and strategic impact support."[41] Based on a multi-tiered knowledge course delivery approach, the RCAF would benefit from a similar model that follows a basic 'foundational' to intermediate 'practitioner' to advanced 'expert/instructor' levels to meet ISR enterprise professionalization requirements.

11. Basic 'Foundational' Level. The short duration basic-level course delivered over approximately five training days serves as the introductory course for all RCAF members with tasks or roles directly within the ISR enterprise. The primary target audience to include personnel employed at the tactical, operational, and strategic levels of ISR force generation, force employment, and force development. Content would provide core common knowledge required when executing the RCAF Air Campaign, including the ISR cycle, tasking processes, strengths and limitations of various collection platforms and sensors, and Intelligence Requirements Management and Collection Management (IRM&CM).

12. Intermediate 'Practitioner' Level. The longer duration intermediate-level course delivered over approximately 10 to 15 training days builds on the knowledge of the foundations' course and introduce specific skills to personnel employed in planning, execution, and assessments of ISR operations. The primary target audience would include personnel assigned to specific ISR roles within the CAOC and tactical units. Content would include the formulation of an operational-level ISR plan, performing IRM&CM tasks, sensor tasking optimization, dynamic collection execution, support to joint targeting, and integrating air and space ISR functions into the wider CAF and coalition joint ISR processes. The course should include a final confirmation exercise to reinforce learning objectives and prepare candidates for immediate employment at the operational and tactical levels.

13. Advanced 'Expert/Instructor' Level. Adopting the approach of the USAF, RAAF, and RAF, the coveted 'weapons instructor' tier of ISR professionals to address "the need for pan-ISR domain subject matter experts who can operate and the tactical and operational levels and in joint, coalition, and single service environments."[42] The course duration would require approximately six months to provide expert-level knowledge of the ISR domain. Graduates of the course to be employed in various roles, including instruction, leadership, and to serve as functional experts across the ISR enterprise. Moreover, qualified personnel would serve as the RCAF's foremost experts on ISR tactics and functional integration with the other aerospace functions.

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[39] J.E. Christianson, *RAF Intelligence, Surveillance and Reconnaissance Fundamentals Course* (Canadian Forces Aerospace Warfare Centre: file 1180-1 (LRP Cap Dev Officer), 16 November 2016), 2-3

[40] Goodfellow Air Force Base, "313th Training Squadron – Factsheet," last accessed 30 January 2021, https://www.goodfellow.af.mil/About-Us/Fact-Sheets/Display/Article/1665529/313th-training-squadron/.

[41] Nellis Air Force Base, "United States Air Force Weapons School – Factsheet," last accessed 30 January 2021, https://www.nellis.af.mil/About/Fact-Sheets/Display/Article/284156/united-states-air-force-weapons-school/.

[42] Royal Air Force, "Qualified Weapons Instructor – Intelligence, Surveillance and Reconnaissance Course" (54 Squadron Information Pamphlet, 2011), 6.

CONCLUSION

14. The RCAF's ISR enterprise will grow considerably in the coming years with the rapid successive introduction of new equipment systems such as MAISR, RPAS, NMA, Future Fighter, space-based sensors, and other expanded capabilities. These aerospace resources will undeniably create a formidable force of aerospace ISR capabilities that will drive the RCAF to become the foremost leader of ISR operations within the CAF. However, it is incumbent upon the RCAF to take a proactive role in preparing the future workforce to deliver the full spectrum of ISR effects in support of domestic and expeditionary operations within the joint all domain environment. The current deficiency of professional knowledge and skills perpetuating the mismanagement of doctrinal ISR processes must be corrected. Looking to our allies, which have developed extensive ISR enterprises over the past decade, highlights the necessity for specialized training and education programs to professionalize their workforces. For the RCAF, the delivery of basic common, intermediate practitioner, and advanced expert-level training will promote the ISR enterprise's professionalization by ensuring that personnel are provided with the requisite level of knowledge and skills to perform their roles and functions across all levels. Ultimately, these efforts will optimize the Air Campaign's contribution to decision superiority the future joint all domain environment for CAF operations at home and around the globe.

RECOMMENDATION

15. In the near-term, the RCAF should investigate the feasibility of developing an aerospace ISR training and education program to address knowledge deficiencies before integrating new ISR equipment systems. Concurrently, it is recommended that the RCAF ISR Functional Integration Team Chair communicate with RAF 54 Training Squadron and USAF 313th Training Squadron to identify lessons learned and potential cooperative opportunities that can be leveraged to meet immediate RCAF training requirements.

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