National Defence Défense nationale

Canadian Forces College

Collège des Forces Canadiennes

AIRCRAFT OPERATING SURFACES CONDITION EVALUATION AND RECONNAISSANCE IN THE CANADIAN ARMED FORCES

LCol T.E. Murphy

JCSP 42

Service Paper

PCEMI 42

Étude militaire

Disclaimer

Opinions expressed remain those of the author and do not represent Department of National Defence or Canadian Forces policy. This paper may not be used without written permission.

Avertissement

Les opinons exprimées n'engagent que leurs auteurs et ne reflètent aucunement des politiques du Ministère de la Défense nationale ou des Forces canadiennes. Ce papier ne peut être reproduit sans autorisation écrite.

Canada

CANADIAN FORCES COLLEGE – COLLÈGE DES FORCES CANADIENNES
JCSP 42 – PCEMI 42
2015 – 2016

JCSP SERVICE PAPER – PCEMI ÉTUDE MILITAIRE

AIRCRAFT OPERATING SURFACES CONDITION EVALUATION AND RECONNAISSANCE IN THE CANADIAN ARMED FORCES

LCol T.E. Murphy

Word Count: 2551

Compte de mots: 2551

AIRCRAFT OPERATING SURFACES CONDITION EVALUATION AND RECONNAISSANCE IN THE CANADIAN ARMED FORCES

Service paper for Commander 2 Canadian Air Division

AIM

1. Currently the Royal Canadian Air Force (RCAF) trains Construction Engineer Officers and Non-commissioned Members (NCMs) on the condition evaluation and reconnaissance of aircraft operating surfaces (AOS) in order to classify potential airfields and approve them for use by Canadian Armed Forces (CAF) aircraft. The aim of this paper is to demonstrate the requirement to institutionalize the current AOS condition evaluation and reconnaissance (ACER)[1] capability as it is being developed by the RCAF and to demonstrate the requirement for a rapid ACER capability within the CAF.

INTRODUCTION

2. In the aftermath of the earthquake which devastated Haiti in 2010, the Government of Canada was interested in rapidly deploying the CAF to provide an immediate response to the disaster. The town of Jacmel was chosen as the site of the main Canadian camp, and Commander 1 Canadian Air Division was tasked with transporting troops, equipment and supplies. However, the condition of the airfield in Jacmel was in question, so the Commander requested an evaluation of the airfield to determine its serviceability. At the time, this evaluation capability existed only within the civilian engineers of the A4 Construction Engineering (A4CE) team in Winnipeg. There were no military Construction Engineers trained to complete the task, despite

[1] This capability is also referred to as Airfield Survey and Reconnaissance (ASAR) but is being considered for a name change as the term ‘airfield’ refers to the larger installation including operational facilities, accommodations, utilities, maintenance facilities, etc. Using the term aircraft operating surfaces (AOS) limits the expectations of the assessment to those areas essential to launch and recover aircraft in a limited operation. The more limited ACER terminology will be used throughout this paper.

the traditional role of the Branch in these endeavours. This revealed a significant capability gap within the RCAF.[2]

3. Since that time, the RCAF has taken steps to close this gap, and as will be shown below, has established a capability that is able to deploy on short notice to permissive environments. However, this capability still requires days to assess an airfield, and there are a number of situations envisioned in the future operating environment which indicate the requirement for a more rapid assessment. In order to demonstrate the requirement of this skillset within the CAF, this paper will examine expectations for the future operating environment where the use of damaged or undocumented AOS is relevant and compare these to the current ACER capability as it is being developed. The related AOS light repair capability being concurrently developed by the RCAF is beyond the scope of this paper.

DISCUSSION

4. Currently the RCAF has developed and implemented the ACER course, which is mandated to train officers and NCMs on "the reconnaissance and evaluation of an airfield's AOS to determine suitability for air operations in a low to medium threat environment."[3] The course trains four-person stand-alone ACER teams to deploy for the purpose of evaluating airfield suitability to support specific airframes and mission durations. The teams, once trained, are equipped by the RCAF to deploy with limited notice (12-48 hours) and placed on high readiness for two years. The ACER teams are able to provide a report on AOS suitability for the expected mission within 48-96 hours of arriving on ground. The assessment is able to recommend an AOS for missions lasting one sortie or years of repeated sorties.

---

[2] Josh Van Tine and James Boone, "Construction Engineer capabilities for airfield assessment and repair," *Flight Comment* 1 (2014): 19. http://publications.gc.ca/collections/collection_2015/mdn-dnd/DC2-2-2014-1-eng.pdf.
[3] Royal Canadian Air Force, *DRAFT AOS Condition Evaluation & Recce (ACER) Concept of Operations*, 7 January 2016: 1.

5. Training is provided every two years as new teams are generated. Three RCAF ACER teams are trained for deployment at any one time, and based across the country depending on their Wing of origin. The Canadian Special Operations Force Command (CANSOFCOM) also maintains at least one ready ACER team. Deployable ACER equipment kits are prepositioned across Canada to enable rapid deployment. Of note, the ACER capability was divorced from the RCAF Managed Readiness Plan due to the higher technical requirements and the higher rate of deployment.

6. According to Air Force Vectors, the future operating environment for the RCAF is expected to cover the full spectrum of operations. CAF involvement in full scale war, lower level conflicts and humanitarian assistance are all probable. Further, the document points out that there will be an ever increasing amount of activity in Canada's North, leading to an increased requirement for search and rescue (SAR) in that region. These predictions lead to a number of enduring defence challenge deductions for air power that include requirements for: air mobility to enable rapid domestic and international responses; an increased focus on Arctic operations; the ability to export security and whole of government efforts to failed or poorly governed states; and a range of capabilities to contribute to the fight for access or freedom of manoeuvre. [4] These deductions apply to RCAF-specific operations as well as joint operations in support of the Canadian Army and CANSOFCOM.

7. At home, the above deductions mean the CAF must maintain a capacity to provide SAR for those in distress anywhere in Canada.[5] Typically, SAR operations are quick response activities with a very short timeframe to find those in distress and provide assistance. Small

[4] Department of National Defence, A-GA-007-000/AF-008, *Air Force Vectors*, 1st Edition (Ottawa: DND Canada, 2014), 9, 10-12, 14-15.
[5] Department of National Defence, *Air Force Vectors*…, 12.

teams are currently able to air drop into most terrain and situations and provide assistance to a small number of injured, while a slower, more capable, response follows. However, SAR technicians can be overwhelmed during mass casualty events and prolonged exposure may result in additional risks to the SAR teams and those in distress. In these cases, the ability to bring fixed wing transport aircraft close to the incident site would considerably increase the reach of the SAR community and speed recovery of those in distress. This is especially true in Canada's North.[6] ACER in support of SAR operations would require the ability to complete the assessment in a matter of hours vice days in order to be effective.

8. Internationally, as the Government of Canada continues to express an interest in deploying the CAF for higher levels of peacekeeping activities, it is reasonable to expect that the CAF could lead missions where more capable allies, such as the United States or the United Kingdom, are not involved. As well, the willingness of the Canadian Government to deploy the military for disaster relief and humanitarian activities is not expected to reduce.[7] Peacekeeping missions, disaster relief, and humanitarian activities infer a requirement to project force using RCAF aircraft into areas where information on existing airfields may be incomplete, the AOS have been damaged by conflict or nature, or where only austere[8] or no facilities exist to support aircraft operations. In such cases, the RCAF requires an ability to reconnoiter those airfields, determine the possibility of safely landing and launching aircraft, and assess the potential duration of operations supportable by the operating surfaces. Especially in the cases of disaster relief and humanitarian assistance, the ability to provide ACER reports within hours vice days of

---

[6] Daniel Lachance, "Arctic Alternative Futures," *The Royal Canadian Air Force Journal* 4 no. 3 (Spring 2015), 112, 114.

[7] Office of the Prime Minister, *Minister of National Defence Mandate Letter*, last accessed 28 January 2016, http://pm.gc.ca/eng/minister-national-defence-mandate-letter.

[8] For a definition of austere, see Department of National Defence. B-GA-406-000/FP-001. *Canadian Forces Aerospace Sustain Doctrine* (Winnipeg: DND Canada, 2011), 62.

arriving on ground would significantly increase the rapidity of Canada's response. In situations where Canada sends medical or urban SAR teams, a rapid response could also help save lives in the critical hours after a disaster.

9. The creation of CANSOFCOM as a separate command, coupled with the increase in resources applied to Special Operations Force (SOF) training and equipment leads to the expectation of higher levels of CAF activities involving SOF, as evidenced by the composition of the training and assistance force in Iraq. Air Force Vectors states that RCAF "doctrine and [tactics, techniques and procedures] TTPs will need to keep pace with the evolving SOF employment concept."[9] The SOF requirement to penetrate deeply into enemy space will, at times, require the ability to rapidly assess and reconnoiter AOS in all types of environments and is essential to a number of SOF key tasks such as special reconnaissance, direct action, counter-proliferation, and non-combat evacuation. [10]

a. For SOF activities such as special reconnaissance, direct action and counter-proliferation, the ability to insert and recover a team of SOF operators and/or vehicles and equipment using fixed wing aircraft would significantly multiply their reach and effectiveness. However, in order to maintain operational security, a principle of special operations, there is a requirement to be able to select less trafficked entry points, such as abandoned airfields, roadways or open fields. In addition, speed is required to allow an aircraft to land within hours of deploying a reconnaissance team to prevent any potential adversaries from identifying the entry point and applying an effective response.

b. The ability to evaluate the condition of an airfield could also be an enabler for non-combatant evacuation operations. These situations are likely to involve remote

[9] Department of National Defence, *Air Force Vectors…*, 20.
[10] Department of National Defence, *CANSOFCOM Capstone Concept for Special Operations 2009* (Ottawa: DND Canada, 2009), 24, 26.

locations surrounded by conflict. In certain cases, an assessment taking several days may be sufficient, such as in Operation PROVISION to transport Syrian refugees to Canada. However, it is easy to foresee such operations where the ability to begin air transport operations within a matter of hours could help prevent failure.

c. Although the current capability as it is being trained in the RCAF enables SOF to increase its reach without the assistance of other nations, CANSOFCOM continues to develop the capability with the aim of reducing the time required on site by the reconnaissance team. Recent activities by the SOF community have enabled the collection of the necessary data using deployed, hand held devices in less than four hours. However, difficulties arose in the transmission and subsequent validation and assessment of the data. This level of capability currently exists with several of our allies.[11]

d. A team capable of classifying an AOS in a matter of days may be acceptable in permissive environments, but it signals to any potential belligerents that the area will be used for future military activity and provides them with significant time to prepare an attack. However, a reconnaissance team deployed with a small SOF element, capable of assessing an AOS in a matter of hours[12], would allow a larger and better equipped team of SOF operators to arrive onsite, avoid detection and maintain the element of surprise. It would also permit the use of fixed wing aircraft to provide an emergency extraction route or medical evacuation support for SOF personnel or to extend the range of rotary wing aircraft through 'lily-padding' of refueling points.

[11] William R. Cunningham, CANSOFCOM Special Air Warfare NCO, telephone conversation with author, 22 January 2016.

[12] Matthew McCloskey, CANSOFCOM, conversation with author 29 January 2016, estimated a team capable of assessing an AOS within 8-12 hours would be sufficient for most SOF tasks.

10. Since the identification of the requirement for ACER in Haiti, the RCAF and CANSOFCOM have developed draft operational concepts, conducted validation assessments and operationalized the capability in overseas locations, such as in Nepal after the 2015 earthquake, and in Canada, in places such as Cambridge Bay and Hall Beach, Nunavut.[13] However, this capability has not yet been institutionalized. Operational level doctrine must be reviewed and updated to reflect the new capability as required and the skill sets of the ACER team should be regularly trained and tested. Regular exercise of the capability will not only ensure skill sets remain current and become refined, but continual testing will serve to build confidence within the flying community that recommendations made by the ACER teams in an operational environment are trustworthy. Without a high level of trust between the ACER teams and the flying units, the decision to land an aircraft on an unproven AOS, which rests doctrinally and appropriately with the commander of the aircraft, may never be taken. This would have the same effect as having never developed the capability in the first place.

11. The capability to execute a reconnaissance and condition evaluation of an AOS within a matter of hours could be developed as a natural evolution of the ACER course. As seen in the CANSOFCOM attempts to develop this capability, the challenges likely rest in the ability to transmit the large volumes of data and maintain data integrity. Commercially available solutions exist for data transmission, but require assessment of their information security technology. Improved collection and data transfer technology within the teams could also be combined with technology to provide detailed information on potential sites before deployment of the team, thereby reducing time on site. This technology could include overflights by aircraft with advanced radar and geo-referenced optical systems. Finally, in the case of the SOF ACER teams, a reach-back capability to A4CE or the RCAF teams when conducting rapid ACER would allow

[13] Josh Van Tine and James Boone, "Construction Engineer capabilities…," 21.

an immediate determination of data validity by Construction Engineers as it is being collected. Technology could be further coupled with a deliberate risk assessment to reduce the information requirements of the reconnaissance team to make an assessment and shorten the time required to provide a report. A small team of technical experts from A4CE and operators from CANSOFCOM would be well suited to finding solutions for a rapid ACER capability.

CONCLUSION

12. As proven in Haiti, Nepal, the North and several SOF operations, there exists a requirement for the CAF to be able to conduct ACER using rapidly deployable military personnel. This capability will enable the CAF to rapidly project force through air mobility assets to locations across Canada and the globe, with or without the assistance of our international allies. However, in order to ensure this capability does not fade as part of the skill set of the Construction Engineers, it should be institutionalized through updates to doctrine, training and personnel management within the RCAF.

13. In addition, it was demonstrated that the ACER capability as it currently exists still allows for gaps in the ability to support the full spectrum of operations predicted by the RCAF and CANSOFCOM in the future operating environment. This gap could be closed by developing a rapid ACER capability that could reconnoiter and assess the condition of an AOS within a matter of hours after the ACER team arrives on site. Longer term operations could then be sustained by expanding the extent of the assessment if required.

RECOMMENDATIONS

14. It is recommended that the RCAF continue to fund the development of the ACER training program; continue to support the current TTPs as they are being developed by A4CE

and 4 CES; and enable opportunities to train and tests these TTPs to develop confidence in this capability within the RCAF community.

15. It is further recommended, that the RCAF create a joint team with CANSOFCOM to develop a rapid ACER capability that will enable the completion of assessments for AOS in a matter of hours vice days.

BIBLIOGRAPHY

Canada. Department of National Defence. A-GA-007-000/AF-008. *Air Force Vectors, 1st Edition.* Ottawa: DND Canada, 2014.

———. Department of National Defence. B-GA-406-000/FP-001. *Canadian Forces Aerospace Sustain Doctrine*. Winnipeg: DND Canada, 2011.

———. Department of National Defence. B-GA-007-002/AGD-01. *DRAFT AOS Condition Evaluation & Recce (ACER) Concept of Operations*. Winnipeg: DND Canada, 7 January 2016.

———. Department of National Defence. *Canadian Special Operations Forces Command: An Overview*. Ottawa: DND Canada, 2008.

———. Department of National Defence. *CANSOFCOM Capstone Concept for Special Operations 2009*. Ottawa: DND Canada, 2009.

———. Office of the Prime Minister. *Minister of National Defence Mandate Letter*. Last accessed, 28 January 2016. http://pm.gc.ca/eng/minister-national-defence-mandate-letter.

Lachance, Daniel. "Arctic Alternative Futures." *The Royal Canadian Air Force Journal* 4 no. 3 (Spring 2015): 101-115.

Schmidt, L.L. *Briefing Note for DComd FG on the Modernization of Capabilities for Airfield Damage Repair (ADR)*. 1 Canadian Air Division: file 7607-1 (A4CE FG2), 92737, 11 April 13.

Van Tine, Josh and James Boone. "Construction Engineer capabilities for airfield assessment and repair." *Flight Comment* 1 (2014): 19-23. http://publications.gc.ca/collections/collection_2015/mdn-dnd/DC2-2-2014-1-eng.pdf.

North Atlantic Treaty Organization. *Standard NATO Agreement (STANAG) 2929 (Edition 5) – Allied Air Traffic Management Publication 03 – Airfield Damage Repair (ADR) Capability, Edition A Version 1*. Brussels: NATO Standardization Office, 2014.