



**FROM COMPLEXITY TO COHERENCE:
A PROPOSAL TO IMPROVE SAR COMMAND AND CONTROL IN THE CAF**

Lieutenant-Colonel Anne Gray

JCSP 50

Service Paper

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.

© His Majesty the King in Right of Canada, as represented by the Minister of National Defence, 2024.

PCEMI n° 50

Étude militaire

Avertissement

Les opinions 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.

© Sa Majesté le Roi du chef du Canada, représenté par le ministre de la Défense nationale, 2024.

CANADIAN FORCES COLLEGE - COLLÈGE DES FORCES CANADIENNES

JCSP 50 - PCEMI n° 50
2023 - 2024

Service Paper – Étude militaire

**FROM COMPLEXITY TO COHERENCE: A PROPOSAL TO IMPROVE SAR
COMMAND AND CONTROL IN THE CANADIAN ARMED FORCES**

Lieutenant-Colonel Anne Gray

“This paper was written by a candidate attending the Canadian Forces College in fulfilment of one of the requirements of the Course of Studies. The paper is a scholastic document, and thus contains facts and opinions which the author alone considered appropriate and correct for the subject. It does not necessarily reflect the policy or the opinion of any agency, including the Government of Canada and the Canadian Department of National Defence. This paper may not be released, quoted or copied, except with the express permission of the Canadian Department of National Defence.”

« La présente étude a été rédigée par un stagiaire du Collège des Forces canadiennes pour satisfaire à l'une des exigences du cours. L'étude est un document qui se rapporte au cours et contient donc des faits et des opinions que seul l'auteur considère appropriés et convenables au sujet. Elle ne reflète pas nécessairement la politique ou l'opinion d'un organisme quelconque, y compris le gouvernement du Canada et le ministère de la Défense nationale du Canada. Il est défendu de diffuser, de citer ou de reproduire cette étude sans la permission expresse du ministère de la Défense nationale. »

FROM COMPLEXITY TO COHERENCE: A PROPOSAL TO IMPROVE SAR COMMAND AND CONTROL IN THE CANADIAN ARMED FORCES

AIM

1. The purpose of this service paper is to examine the current Command and Control (C2) framework for Search and Rescue (SAR) operations within the Canadian Armed Forces (CAF), to examine its efficacy, and to make a recommendation for improvement. Specifically, this paper contends that the current force employment (FE) C2 framework is disaggregated and unnecessarily complex and will recommend that C2 for SAR FE be centralized to improve coherence.

INTRODUCTION

2. Canada's area of responsibility (AOR) for the provision of SAR services is massive, exceeding 18 million square kilometres, encompassing 243,800 kilometres of coastline spanning three oceans, and containing approximately three million lakes¹ it is one of the most challenging SAR AORs in the world. In addition to the size of the AOR the complexity of SAR in Canada is further exacerbated by widely varying terrain, extreme weather, and low population density.
3. SAR in Canada is a shared responsibility with federal, provincial/territorial, municipal, and volunteer organizations each having a specific role. At the federal level, the Minister for Public Safety and Emergency Preparedness holds the responsibility for the National SAR Program and executes this responsibility via the National SAR Secretariat. Within this framework, SAR activities span several jurisdictions:
 - a. The CAF is responsible for aeronautical incidents and the effective operation of the federally coordinated aeronautical and maritime SAR system²;
 - b. The Canadian Coast Guard (CCG) is responsible for maritime incidents;
 - c. Provincial/territorial governments are responsible for Ground SAR, noting this responsibility is typically delegated to police services³; and
 - d. A network of 15,000 SAR volunteers multiply the response capabilities of the aforementioned authorities.⁴
4. The CAF coordinates the federal response for SAR services by dividing the Canadian AOR into three Search and Rescue Regions (SRRs), Victoria, Trenton, and Halifax as

¹ Government of Canada. Public Safety Canada. "Archived - Quadrennial Search and Rescue Review - Report" last accessed 11 February 2024. <https://www.publicsafety.gc.ca/cnt/rsrctns/pblctns/archive-nss-qdrnml-rvw/index-en.aspx>.

² Government of Canada. National Defence. "Search and Rescue - Royal Canadian Air Force." last accessed 11 February 2024. <https://www.canada.ca/en/air-force/programs/search-rescue.html>.

³ NOTE: the exception to this is within the boundaries of National Parks, where the responsibility for GSAR falls to Parks Canada.

⁴ Government of Canada. Public Safety Canada. "National Search and Rescue Program." last accessed 11 February 2024. <https://www.publicsafety.gc.ca/cnt/mrgnc-mngmnt/rspndng-mrgncvnts/nss/prgrm-en>.

depicted in Annex A, each with an SRR Commander (Comd) responsible to the Comd Canadian Joint Operations Command (CJOC) as the designated Force Employer. Comd CJOC delegates operational control (OPCON) of assigned SAR high-readiness assets to the SRR Comds. Each SRR Comd is supported by a Joint Rescue Coordination Centre (JRCC), jointly staffed by the CAF and CCG. Tactical control (TACON) of dedicated SAR assets is delegated in the Officer in Charge (OIC) of the SRR JRCC. Figure 1 depicts the current C2 framework as prescribed in the CJOC SAR Directive for 2023.

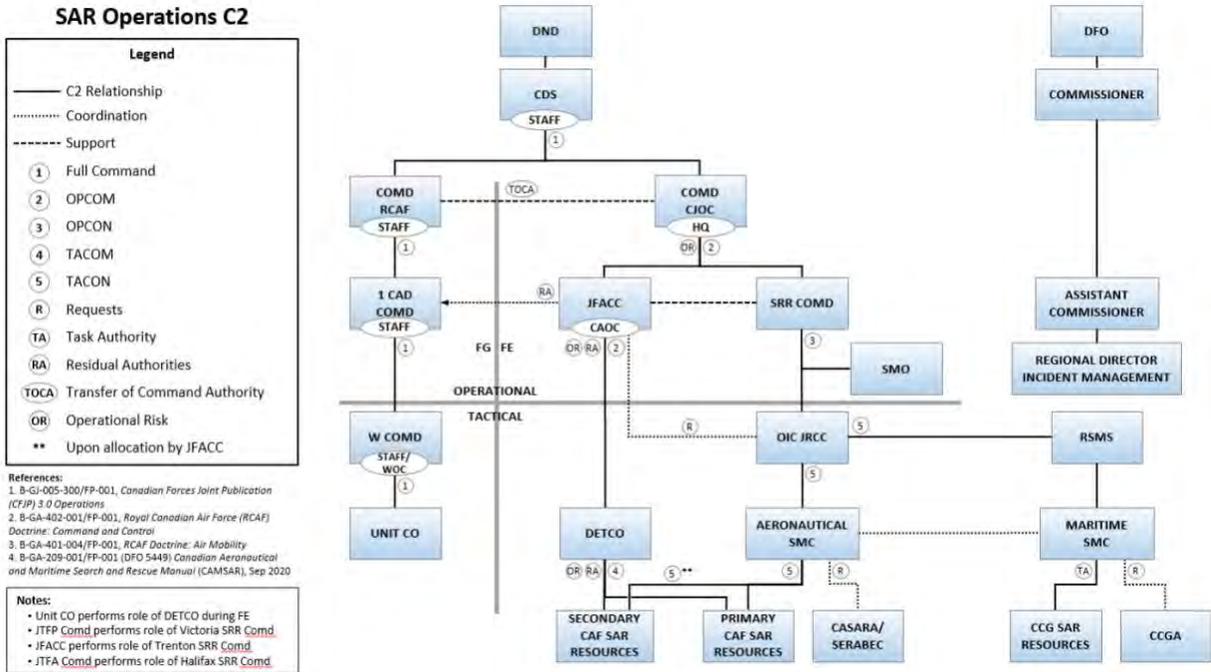


Figure 1 – Current SAR Operations C2
CJOC SAR Directive 2023 – Annex B

- Of note, the SRR Comds Victoria, Trenton, and Halifax are also, in order, the Joint Task Force (JTF) Comd Pacific, the Joint Forces Air Component Comd (JFACC), and the JTF Comd Atlantic. However, it is important to recognize that the SRR boundaries do not align with those of the Regional JTFs, indeed the SRRs overlap multiple Regional JTF AORs as seen in Figure 2 and this can lead to confusion at the staff level.⁵

⁵ K.G. Grieve, “The Current Command and Control Structure for the RCAF’s Aeronautical Search and Rescue: A Proper Enabler.” Joint Command and Staff Program Course Paper, Canadian Forces College, 2015.

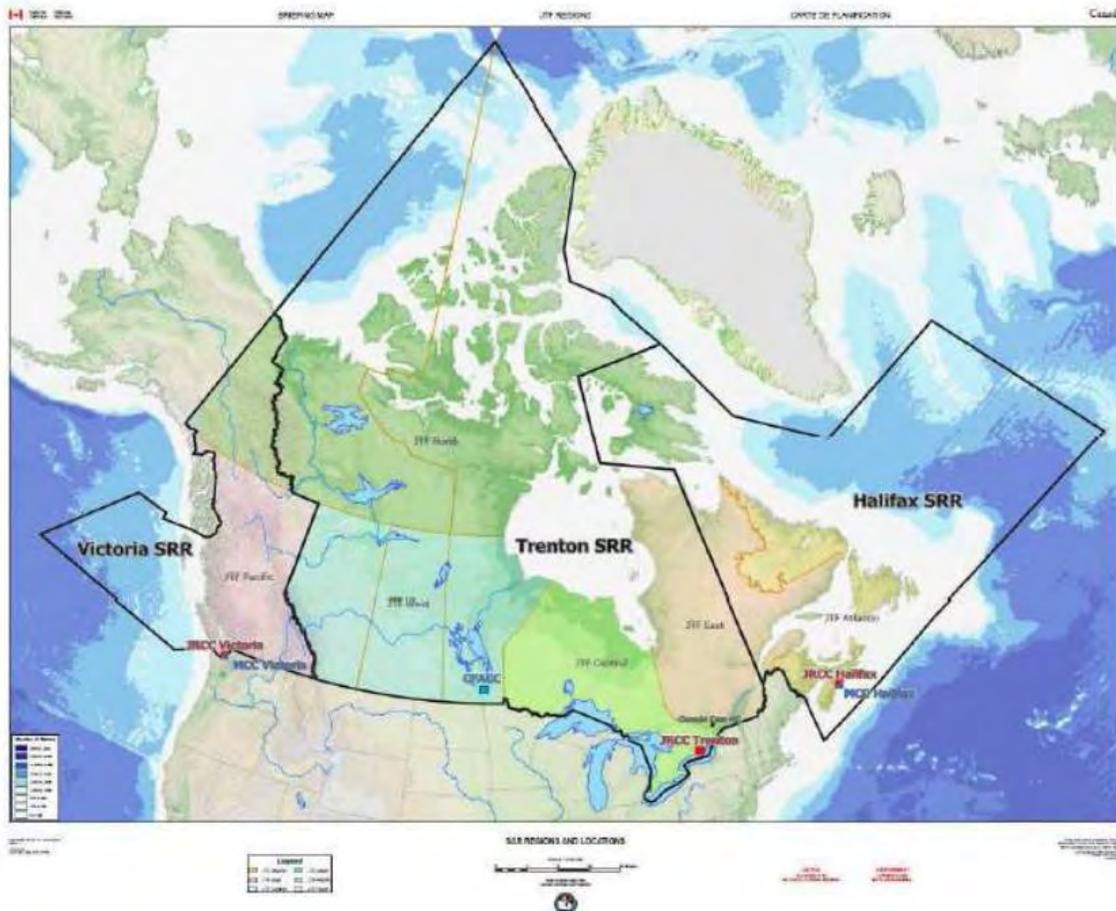


Figure 2 – SRR AOR overlay on RJTF AORs

K. Grieve, “The Current Command and Control Structure for the RCAF’s Aeronautical Search and Rescue: A Proper Enabler.” Joint Command and Staff Program Course Paper, Canadian Forces College, 2015, 9.

6. To further exacerbate this challenge, the JTF Comds Pacific and Atlantic are also Comd Maritime Fleet Pacific and Comd Maritime Fleet Atlantic, respectively. As a result, these two individuals and their senior staffs are always Royal Canadian Navy (RCN) personnel. Unsurprisingly, given their primary mandates, they are experts in the force generation (FG) and FE of Naval power but have a more limited understanding of air power and the employment of air power in SAR operations. This contributes to the disaggregation of the operational SAR C2 structure. Conversely, the SRR Comd Trenton, in addition to being the JFACC to Comd CJOC, is also the Comd 1 Canadian Air Division and therefore is a Royal Canadian Air Force (RCAF) officer with an organic RCAF staff well versed in the FG and FE of air power. It is here that an example of how to streamline SAR C2 overall can be centralized to improve coherence can be found.

DISCUSSION

7. To enable the CAF’s FE mandate for SAR, Comd Royal Canadian Air Force (RCAF) is tasked to FG eight continuous high-readiness primary SAR assets and the crews to operate and maintain those assets. This task is further delegated to Comd 1 CAD for execution as 1 CAD is responsible for air power generation and delivery on behalf of the RCAF. These high-readiness assets, as depicted in Figure 3, are then designated to CJOC via the JFACC to meet the required response postures, 30 minutes (RP30) or 2 hours (RP2) depending on circumstance, as ordered in the Comd CJOC SAR Directive.⁶ The CAF does not FG any naval or land elements fully dedicated to SAR operations and has no mandate to do so. Related to SAR operations, the RCN and Canadian Army are only mandated to provide personnel in support of a mass rescue operation (MRO), a situation that would differ little from any other humanitarian-focused domestic operation and would fall under the authority of Comd CJOC for FE. For the CAF SAR is primarily an RCAF mission.

OPCON	Halifax SRR Comd			Trenton SRR Comd			Victoria SRR Comd	
Asset	1 x CH149	1 x CH149	1 x CC130H	1 x CH146	1 x CC130H/J	1 x CC130H	1 x CH149	1 x CC130H*
FG Unit	103 Sqn 9 Wing	413 Sqn 14 Wing		424 Sqn 8 Wing		435 Sqn 19 Wing	442 Sqn 19 Wing	
Location	CFB Gander	CFB Greenwood		CFB Trenton		CFB Winnipeg	CFB Comox	

*Victoria SRR CC130H currently FG by 435 Sqn; will be FG by 442 Sqn in Summer 2023

Figure 3 – High Readiness Primary SAR Assets
CJOC SAR Directive 2023 – Annex B

8. As previously mentioned, to support the SRR Comds, the CAF and CCG work together to operate three JRCCs, one in each SRR. JRCCs are “responsible for the planning, coordination, conduct, and control of SAR operations”.⁷ Additionally, the CCG staffs Maritime Rescue Sub-Centres (MRSC) in Quebec City and St. John’s which are designed “to reduce the JRCC's workload in areas of high marine activity”⁸ and to enable domain subject matter experts (SMEs) to focus on their area of experience. It is Comd RCAF who owns the task of staffing the JRCCs from a CAF perspective and the OICs of the JRCCs are RCAF officers at the rank of Major.
9. The JRCC OICs are responsible to their respective SRR Comd through the Senior Military Officer (SMO) for SAR. Each SMO is appointed from within the respective SRR Comds integral chain of command.⁹ For SRR Victoria and SRR Halifax this results

⁶ Canada. Department of National Defence and Department of Fisheries and Oceans Canada. B-GA-209-001/FP-001, Canadian Aeronautical and Maritime Search and Rescue Manual – CAMSAR. Ottawa: DND and CCG Canada, 2020. 1.06.3.

⁷ Government of Canada. Canadian Coast Guard. “Maritime Search and Rescue (SAR) in Canada.” last accessed 11 February 2024. <https://www.ccg.gc.ca/publications/search-rescue-recherche-sauvetage/sar-canada-res-eng.html>.

⁸ Government of Canada. “Maritime Search and Rescue in Canada.”

⁹ Commander Canadian Joint Operations Command. “CJOC Search and Rescue Directive 2023.” 31 January 2023.

in a Captain (Navy), whose primary function is to be Chief of Staff to Comd Maritime Forces Pacific or Atlantic, being designated as the SMO for SAR operations. For these two SRRs the SRR/SMO appreciation of a situation is likely to not be as well informed as it would be in SRR Trenton where the SMO and SRR Comd are air power experts and have the additional benefit of being able to leverage the Combined Air Operations Centre (CAOC) for support. This adds an additional layer of complexity to the chain of command in those two SRRs and injects another individual who is not an SME in the command and control of air power into a predominately air-centric mission set further disaggregating the C2 framework.

10. RCAF doctrine states that, “centralized control and decentralized execution is the fundamental tenet of air power as it relates to C2.”¹⁰ Centralized control enables efficient use of limited air power resources and provides the ability to respond rapidly to the changing demands and priorities of an operational situation. It is this logic that led to the original development of the JFACC concept.¹¹ The nature of SAR operations, the reality of Canadian geography, and the locations of the units responsible to FG primary SAR assets conspire to result in a situation where assets from one SRR are often needed to respond to an incident in an adjacent SRR or where assets beyond the primary high-readiness assets may be required. This fact is recognized in the CJOC SAR Directive for 2023. However, where agreement cannot be reached at a lower level to share primary SAR assets between SRR regions it is Comd CJOC who is to be the arbiter of allocation¹², a task that certainly seems ripe for delegation to the JFACC given a few changes to the existing C2 framework that will continue to be explored below. Nor do the SRR Comds have the authority to declare additional assets to a SAR mission without returning to the JFACC to have those assets declared. This also adds an additional layer in a mission where time is of the essence. Centralized control of air power is most effective when exercised by a single individual “possessing a theatre-wide perspective and the authority to assign air power to best achieve objectives.”¹³ For Canadian SAR missions, this individual is undoubtedly the JFACC as a result of their other role as Comd 1 CAD. Comd 1 CAD is uniquely situated to have a fulsome understanding of the capabilities, disposition, and readiness of the aviation assets and crews assigned to primary SAR response and can make informed decisions, supported by SMEs on their integral staff, as to the best allocation to meet the mission demands across the Canadian SAR AOR. This is not a situation that any of Comd JTF Pacific, Comd JTF Atlantic, nor even Comd CJOC, are in a position to make with the degree of speed and accuracy required for this dynamic and vital mission set.

¹⁰ Canada. Department of National Defence. B-GA-402-000/FP-001. Royal Canadian Air Force Doctrine – Command and Control. Ottawa, Ont: Joint Doctrine Branch, 2018.

¹¹ Fawcett, Lt Col John M. "The JFACC Team." Air University Journal.

<https://www.airuniversity.af.edu/portals/10/aspi/journals/chronicles/fawcett.pdf>.

¹² Commander Canadian Joint Operations Command. “CJOC Search and Rescue Directive 2023.”

¹³ Canada. Royal Canadian Air Force Doctrine – Command and Control.

11. The factors that support higher degrees of centralized control are unity of command, concentration of force, and economy of effort.¹⁴ While it could be argued that in the case of SAR unity of command is achieved by having Comd CJOC as the designated commander, the span of CJOC's responsibilities is wide and SAR, though important, is only a portion of a demanding portfolio. Reconsidering the SAR C2 framework to achieve unity of command at a lower echelon would be supported by greater centralized control. Concentration of force is the second factor to consider in the degree of centralized control of air power. SAR missions are dynamic and demanding, and when a major SAR is declared it is not uncommon for the demands to exceed the resources available in the SRR to meet a timely response. Increasing the level of centralized control would better facilitate both the movement of assets between the current SRR boundaries and the declaration of additional assets from within the SRR when required. Lastly, economy of effort speaks to expending the minimum resources in areas other than that of the main effort and is the last consideration for the degree of centralized control to be imposed. In a SAR context, this could result in decisions to send different assets or assets located outside the SRR but based closer to the search area. Again, this would be better achieved with a higher level of centralized control over the primary SAR assets. For example, in the case of the tragic death of Makkovik teenager, Burton Winters, in 2012 multiple decision factors could potentially have been simplified with a more coherent SAR C2 framework. While this case was a Ground SAR incident and as such the primary responsibility of the Newfoundland and Labrador provincial government, there was a request for assistance made to the JRCC for aviation assets. A combination of bad weather and a lack of serviceable aircraft delayed the employment of CAF assets to assist.¹⁵ While it is unlikely in this specific case that anyone could have reached the boy in time to save him, this case nonetheless serves as an interesting case study for a more centralized SAR C2 framework. It is possible that the ability to call for assets from outside the SRR or to declare additional assets to the search effort may have aided in the more rapid discovery of the victim.
12. The aforementioned arguments support a modification to the existing C2 framework for SAR to increase the level of centralized control. This would eliminate redundancy, improve efficiency, and reduce confusion while simultaneously leveraging SMEs in their own domains. This could be achieved with a relatively simple change. The distinct SRR Comds and SMOs should be eliminated in favour of a single, National SRR Comd. Transitioning to a single National SRR Comd would also reduce the confusion that arises from having SRR boundaries that are not aligned with JTF Comd's AORs. A single SRR Comd would have the unilateral discretion to move primary SAR assets across SRR boundaries as required by mission or environmental demands.
13. As SAR is a primarily RCAF mission, the JFACC should be named the National SRR Comd in this modified framework. As the JFACC is, "the commander responsible for making recommendations to the Comd CJOC on the proper employment and C2 of all

¹⁴ Canada. Royal Canadian Air Force Doctrine – Command and Control.

¹⁵ Heidi Atters. "DND Defends Burton Winters Search Decisions during Inquiry | CBC News." Accessed Feb 18, 2024. <https://www.cbc.ca/news/canada/newfoundland-labrador/department-national-defence-decisions-1.6168431>.

assigned, attached and made-available air forces”¹⁶ this role would align with their already assigned responsibilities. Additionally, the JFACC is supported by a 24/7 CAOC that maintains constant situational awareness of the disposition of air assets within Canada. Indeed, the CAOC is, “structured to operate as a fully integrated facility and includes the personnel and equipment necessary to accomplish the planning, directing, controlling and coordinating of theatre-wide air operations.”¹⁷ As such is perfectly situated to have a complete understanding of the capabilities, disposition, and readiness of all SAR high-readiness assets as well as those that could be leveraged for secondary response should the situation demand a greater response. This solution would best address the currently disjointed nature of the SAR C2 framework and ensure that the National SRR Comd is appropriately supported and enabled by a well-informed staff of SMEs in the domain.

14. Importantly, this proposal to condense the SAR C2 framework does not include a recommendation to change the location or structure of the existing JRCCs to also centralize that function. The reason for this is twofold. Firstly, there is a relational benefit to collocating with CCG partners who are the experts in the maritime domain for SAR operations. Secondly, locating the JRCCs near to the primary SAR FG units enables posting of individuals between the JRCC and the flying units. This ensures balanced career development opportunities and for expertise to be maintained in both functions. Centralizing the JRCC in one location would have a detrimental impact on this ease of movement. In the current period of personnel shortages and retention challenges, this would be inadvisable.

CONCLUSION

15. This service paper examined the current C2 framework for SAR operations in Canada, evaluated its efficacy, and concluded that the current C2 framework for SAR operations in the CAF is unnecessarily complex and disaggregated. The employment of distinct SRR Comds who are already double and triple-hatted with other responsibilities and who are not SMEs in the domain injects confusion that could be eliminated with a fairly simple modification to the structure. The recommended solution empowers SMEs in the domain to be the decision-makers and aligns the C2 framework for SAR with existing RCAF doctrine by leveraging the JFACC more appropriately, providing a single nexus for the execution of this no-fail mission for Canada and Canadians.

¹⁶ Major Pux Barnes. "The JFACC and the CAOC-Centric RCAF: Considerations for the Employment of Air Power in Joint Operations - RCAF Journal - Royal Canadian Air Force." The Royal Canadian Air Force Journal 3, no. 3 (12-08, 2014).

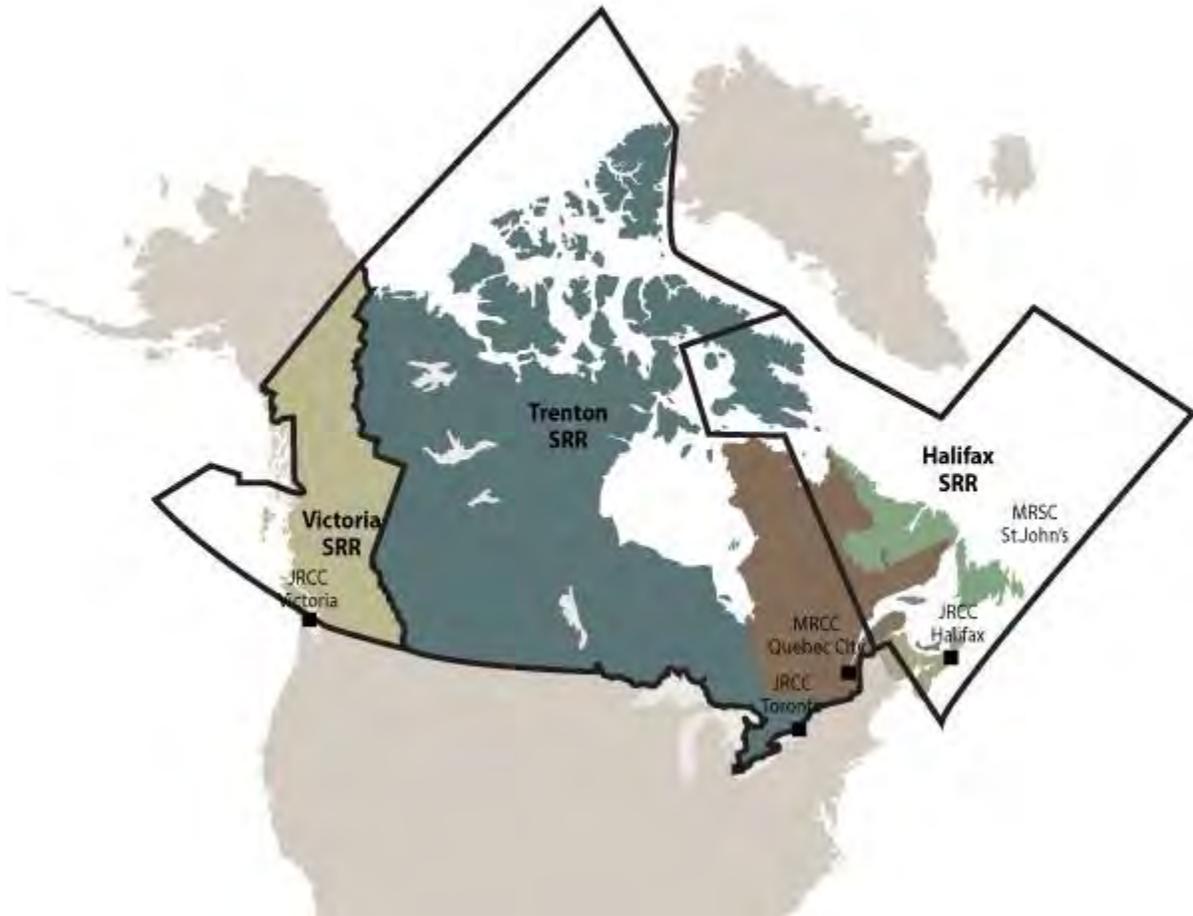
<https://www.canada.ca/en/air-force/corporate/reports-publications/royal-canadian-air-force-journal/2014-vol3-iss3-04-the-jfacc-and-the-caoc-centric-rcaf.html>.

¹⁷ Barnes. "The JFACC and the CAOC-Centric RCAF."

RECOMMENDATION

16. It is recommended that the current C2 framework for SAR operations in the CAF be modified to eliminate the redundant SRR chains of command and to appoint a single National SRR Comd. This National SRR Comd should be the JFACC and the existing JRCCs should be retained and report to the JFACC.

ANNEX A – Canadian SRRs



Canadian Search and Rescue Regions

Government of Canada, Canadian Coast Guard, Search and Rescue program information

BIBLIOGRAPHY

- Atter, Heidi. "DND Defends Burton Winters Search Decisions during Inquiry | CBC News." Accessed Feb 18, 2024. <https://www.cbc.ca/news/canada/newfoundland-labrador/department-national-defence-decisions-1.6168431>.
- Barnes, Major Pux. "The JFACC and the CAOC-Centric RCAF: Considerations for the Employment of Air Power in Joint Operations - RCAF Journal - Royal Canadian Air Force." *The Royal Canadian Air Force Journal* 3, no. 3 (12-08, 2014).
<https://www.canada.ca/en/air-force/corporate/reports-publications/royal-canadian-air-force-journal/2014-vol3-iss3-04-the-jfacc-and-the-caoc-centric-rcaf.html>.
- Barnes, Major Pux. "Command or Control? Considerations for the Employment of Air Power in Joint Operations - RCAF Journal - Royal Canadian Air Force." *The Royal Canadian Air Force Journal* 3, no. 3 (12-08, 2014).
<https://www.canada.ca/en/air-force/corporate/policies-standards/royal-canadian-air-force-doctrine/command-control/c2-article-1-command-or-control.html>.
- Canada. Department of National Defence. B-GA-400-000/FP-001. Royal Canadian Air Force Doctrine. Ottawa, Ont: Joint Doctrine Branch, 2016.
- Canada. Department of National Defence. B-GA-402-000/FP-001. Royal Canadian Air Force Doctrine – Command and Control. Ottawa, Ont: Joint Doctrine Branch, 2018.
- Canada. Department of National Defence. B-GJ-005-300/FP-001. Canadian Forces Joint Publication, 3.0 Operations. Ottawa, Ont: Joint Doctrine Branch, 2010.
- Canada. Department of National Defence. B-GJ-005-000/FP-001. Canadian Forces Joint Publication, 01 Canadian Military Doctrine. Ottawa, Ont: Joint Doctrine Branch, 2009.
- Canada. Department of National Defence and Department of Fisheries and Oceans Canada. B-GA-209-001/FP-001, Canadian Aeronautical and Maritime Search and Rescue Manual – CAMSAR. Ottawa: DND and CCG Canada, 2020.
- Chief of the Defence Staff. "CDS Directive for Search and Rescue." 5 October 2023.
- Commander Canadian Joint Operations Command. "CJOC Search and Rescue Directive 2023." 31 January 2023.
- Fasquelle, F. "A Recommended Improvement to the Search and Rescue Regional and Command Construct." Joint Command and Staff Program Course Paper, Canadian Forces College, 2022.
- Fawcett, Lt Col John M. "The JFACC Team." *Air University Journal*. <https://www.airuniversity.af.edu/portals/10/aspi/journals/chronicles/fawcett.pdf>.

Government of Canada. Canadian Coast Guard. “Maritime Search and Rescue (SAR) in Canada.” last accessed 11 February 2024. <https://www.cgc.gc.ca/publications/search-rescue-recherche-sauvetage/sar-canada-res-eng.html>.

Government of Canada. National Defence. “Search and Rescue - Royal Canadian Air Force.” last accessed 11 February 2024. <https://www.canada.ca/en/air-force/programs/search-rescue.html>.

Government of Canada. Public Safety Canada. “National Search and Rescue Program.” last accessed 11 February 2024. <https://www.publicsafety.gc.ca/cnt/mrgnc-mngmnt/rspndng-mrgncvnts/nss/prgrm-en>.

Government of Canada. Public Safety Canada. “ARCHIVED - Quadrennial Search and Rescue Review - Report” last accessed 11 February 2024. <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/archive-nss-qdrnrl-rvw/index-en.aspx>.

Grieve, K.G. “The Current Command and Control Structure for the RCAF’s Aeronautical Search and Rescue: A Proper Enabler.” Joint Command and Staff Program Course Paper, Canadian Forces College, 2015. <https://www.cfc.forces.gc.ca/259/290/317/305/grieve.pdf>

Livingston, W. “Current C2 Construct for the Joint Rescue Coordination Centres and the Canadian Mission Control Centre: A Model with Doctrinal Incongruences.” Joint Command and Staff Program Course Paper, Canadian Forces College, 2023. <https://www.cfc.forces.gc.ca/259/290/49/192/Livingston.pdf>

Marcus, P.L. “Command and Control in the Canadian Armed Forces SAR System.” Joint Command and Staff Program Course Paper, Canadian Forces College, 2016. <https://www.cfc.forces.gc.ca/259/290/301/305/marcus.pdf>