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Value of a CAF Member's Life: Doctrine and Policy Changes Needed in a Resource Constrained Environment

Lieutenant-Colonel Rod Short

JCSP 49

Service Paper

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PCEMI n° 49

Étude militaire

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CANADIAN FORCES COLLEGE - COLLÈGE DES FORCES CANADIENNE

JCSP 49 - PCEMI n 49
2022 - 2023

Service Paper – Étude militaire

**VALUE OF A CAF MEMBER’S LIFE:
DOCTRINE AND POLICY CHANGES NEEDED
IN A RESOURCE CONSTRAINED ENVIRONMENT**

Lieutenant-Colonel Rod Short

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VALUE OF A CAF MEMBER'S LIFE: DOCTRINE AND POLICY CHANGES NEEDED IN A RESOURCE CONSTRAINED ENVIRONMENT

AIM

1. The purpose of this paper is *to inform* the Vice Chief of Defence Staff (VCDS), of current gaps in the risk management processes across the Elements,¹ and *to recommend* the development of standardized risk management processes, with an associated budget line that enables rapid procurement of materiel that will reduce risk to personnel. This budget should be managed under Chief of Programs (C Prog) and be exploited when new technology related to safety emerges, or when risks cannot be mitigated to a level that is As Low As Reasonably Practicable (ALARP). Such an approach requires a Cost Benefit Analysis (CBA) and should consider a monetary value to be placed on preventing a fatality.

INTRODUCTION

2. When technological safety advances occur, or when safety issues are discovered during training or operations, mitigating this risk is a fundamental requirement for commanders. The Royal Canadian Air Force (RCAF) and Canadian Army (CA) capture this risk management requirement formally within doctrine under the Shield Operational Function, and the Royal Canadian Navy capture it more broadly within LEADMARK 2050. Securing funding to reduce the risk to personnel, however, often proves challenging as safety improvements often compete with new operational demands in a resource constrained environment. The existing process requires improvement in order to enable commanders to more easily fund safety initiatives while not directly competing with operational resources. This approach should be consistent across the Elements, and should be led and implemented by C Prog.

3. This Service Paper will start by advocating that the CAF should better enable commanders to invest in safety improvements to further enhance the Operational Function of Shield, thereby further enhancing operational capability. It then reviews existing policy in the safety domain to identify where the gaps exist within safety policy, and importantly, how to close these gaps. Finally, it will examine how technological safety advances, and in-service safety issues, can be addressed and justified using a CBA approach in order to objectively determine whether the safety investments are worth the resource.

SAFETY WITHIN CAF DOCTRINE

4. The CA defines the Shield function at the tactical level to, “include protective measures through air defence, counter mobility and survivability, such as the construction of defences and the hardening of structures.”² It also makes clear that this function captures force protection measures which are the commander’s responsibility, and that these measures should not be over-

¹ Royal Canadian Navy, Canadian Army, Royal Canadian Air Force, and Canadian Special Operations Forces Command.

² Department of National Defence, B-GL-300/FP-000, Land Operations (Ottawa: DND Canada, 1998), 4-20.

emphasized or this could actually lead to defeat.³ The CA therefore acknowledges that a balance should be struck between the apportionment of limited resources and force protection measures. However, guidance is not provided to commanders on how to assess the point at which risk has been sufficiently mitigated; instead, this is left up to their discretion which can lead to inconsistency within the CA as commanders may focus resources towards other initiatives rather than increasing safety to their personnel due to limited financial and human resources. Commanders that are better guided and enabled to invest in protective measures can further reduce risk to their personnel, thereby positively impacting the CA's ability to achieve its operational objective to project power. Better enabling commanders to reduce risk could be accomplished through an independent safety process and budget, managed by C Prog. The problem is not unique to the CA, as similar challenges exist within the RCAF and RCN.

5. The RCAF Capstone Doctrine document⁴ describes the Operational Functions which closely overlap that of the CA's. The doctrine specifically identifies safety as a commander's responsibility stating that force protection and even health risks must be understood at all levels to allow for risk mitigation. Supporting doctrine further elaborates on the Shield function by stating that without the Shield function, "the Command, Act, and Sense activities could be compromised or even eliminated,"⁵ resulting in the CAF's inability to achieve its mission. The RCAF's emerging Strategy,⁶ also places an emphasis on the value of its personnel, stating that safe workplaces are essential for all members. Similar to the CA though, guidance on the appropriate amount of risk mitigation is not provided and as a result, resources for safety initiatives could compete with operational demands, making them difficult to justify in a resource constrained environment. An independent process for safety initiatives, managed by C Prog, would alleviate these challenges.

6. RCN doctrine,⁷ by contrast, is relatively scarce on the commander's responsibility to manage the risk to personnel. However, referring to the RCN's capstone LEADMARK 2050 document, it could be argued that the RCN's ability to execute their fundamental purpose of Protect, Prevent and Project,⁸ would be significantly degraded if the risk to personnel was not managed and mitigated appropriately. Looking more broadly at US Navy Doctrine, when considering Seapower Essential Functions, the function of Operational Access considers the Navy's ability to project military force in a contested area, including being able to defend against innovative weapon systems from asymmetric threats.⁹ The RCN's ability to pivot, procure defence systems rapidly to enable force protection, and protect its personnel is essential to being able to achieve Operational Access. Therefore, from a doctrinal perspective, safety is more implicit. As will be described below, safety and risk management concepts are captured in much more detail in their Naval Materiel Risk Management, "policy."

³ Department of National Defence, B-GL-300/FP-000, Land Operations (Ottawa: DND Canada, 1998), 3-7.

⁴ Department of National Defence, B-GA-400-000/FP-001, Royal Canadian Air Force Doctrine (Ottawa: DND Canada, 2016), 25.

⁵ Department of National Defence, B-GA-403-000/FP-001, Canadian Forces Aerospace Shape Doctrine (Ottawa: DND Canada, 2014), 2.

⁶ Department of National Defence, "RCAF Strategy; Agile, Integrated, Inclusive," draft, January 2023.

⁷ United States Department of Defense, Joint Publication 3-32, Joint Maritime Operations, 2018.

⁸ Department of National Defence, Canada in a New Maritime World, LEADMARK 2050, (Ottawa: DND Canada), iv.

⁹ United States Department of Defense, Joint Publication 3-32, Joint Maritime Operations, 2018, I-3.

7. Finally, taking a doctrinal view across the Elements, the CF Joint Protection Doctrine¹⁰ goes even further by stating that force protection is a Command responsibility and that commanders fill this responsibility by using all resources at their disposal. The document goes on to say that by executing this responsibility it will, “enhance the conduct and continuity of operations.”¹¹ With a greater emphasis on people than ever before, it is essential that commanders do everything in their power to mitigate risk to personnel. The doctrine described above states the requirement for commanders to protect and mitigate risk to their personnel, and while a C Prog managed process would ensure consistency, and achieve a doctrinal aim, it is also essential to review the risk management policies across each of the Elements to better understand the gaps, and how C Prog could potentially close them.

CAF SAFETY POLICY AND CLOSING THE GAPS

8. To manage risk, the RCAF apply a mature risk management policy that is employed by both technical and operational staff.¹² The policy relies on technical staff determining the particular hazard severity and probability, applying risk mitigation, and coming up with an action plan to mitigate the risk to an Acceptable Level of Safety (ALOS). So long as the risk is below the ALOS threshold, it no longer requires mitigation. Furthermore, if the risk is above ALOS, the appropriate authority may choose to simply accept the risk¹³. A gap in the process therefore exists as there is currently no obligation to mitigate the risk to a point where any further investment would result in minimal safety gains. In other words, a commander may have a risk that is ALOS but a minor investment could completely eliminate the risk, yet there is no requirement to spend resources on this mitigation. This is the fundamental concept of ensuring risks are ALARP.

9. By contrast, the RCN requires risks to be mitigated to a level that is ALARP. In other words, “risk reduction should continue, even lower than the acceptable level, as long as the effort in cost or time is not disproportionate to the benefit or opportunity gained.”¹⁴ The Navy policy does not provide guidance on how to determine the costs or benefits, only the high-level concept of ALARP, which is a gap in the current policy which should be addressed.

10. The CA and CANSOFCOM have both revamped their risk management process based on the RCAF. The latest policy¹⁵ is awaiting level one sign off but the same fundamental principles apply, in that risk must be mitigated to an Acceptable Level of Risk (ALOR) which is analogous to the RCAF term ALOS. Similar to the RCAF process, there is no requirement to further mitigate below ALOR, and if above the ALOR threshold, the Technical and Operational Authority may choose to accept the risk. The same gap exists in the CA as the RCAF, in that a

¹⁰ Department of National Defence, B-GJ-005-314/FP-000, *CF Joint Force Protection*, (Ottawa: DND Canada, 2007).

¹¹ Department of National Defence, B-GJ-005-314/FP-000, *CF Joint Force Protection*, (Ottawa: DND Canada, 2007), 1-9.

¹² Department of National Defence, *EMT01.003 Airworthiness Risk Management Process*, dated 7 Feb 2022.

¹³ Department of National Defence, *EMT01.003 Airworthiness Risk Management Process*, dated 7 Feb 2022, 19

¹⁴ Department of National Defence, C-23-005-000/AG-002, *Naval Materiel Risk Management* (Ottawa: DND Canada, 2013, 1-7.

¹⁵ Department of National Defence, *10001-1 DGLEPM System Safety Program* (Ottawa: DND Canada, draft).

minimal investments in safety, can still result in significant risk reduction using the ALARP principle, yet this concept is not captured in the policy.

11. To close the gaps noted above for the RCAF, RCN and CA, C Prog, as the Vice Chief of Defence Staff (VCDS) delegated Risk Officer,¹⁶ should engage with the Elements to ensure that the ALARP concept is incorporated into their respective risk management policies. In parallel, C Prog should also establish and manage a budget exclusively dedicated to safety related improvements in the CAF which would help to ensure that safety initiatives do not compete with operational resources. Each of the Elements would be required to make an argument that funding is required to mitigate the risk to an ALARP level. In summary, the benefits of the safety initiative must outweigh the cost, which will be described further in the following section.

JUSTIFYING SAFETY IMPROVEMENTS USING A CBA

12. When in-service risks are discovered, or when technological safety advances have emerged¹⁷ and can be adopted by the CAF, then commanders and ADM(Mat) personnel should work together to evaluate the risk along with the associated cost. This should be executed using a CBA approach, and should be a requirement for Project Teams in ADM(Mat) to ensure risks are mitigated to an ALARP level. A CBA would include a qualitative assessment of the risk as captured under Treasury Board (TB) policy, as well as a quantitative assessment of the costs compared to the benefits. Quite simply, if the following equation is satisfied, along with a supporting qualitative assessment of the proposal, then the initiative should be funded under a budget line managed by C Prog:

$$\frac{Cost}{Benefits} < 1$$

13. The costs are relatively straight forward to consider, but in the case of benefits, it is the avoidance of death or injury which need to be accounted for. Placing a value on preventing a fatality is the only way in which an objective view can be taken towards resource allocation, and it is a process already captured within TB policy. It is proposed that TB policy be used as guidance to assign a value to preventing a fatality until a military specific value can be derived. TB currently allows government departments to apply a Value of Statistical Life (VSL) when preparing a CBA.¹⁸ The policy sets a VSL is \$6.5 million, and accounting for inflation since 2007, this equates to \$8.9 million in 2022¹⁹. It is proposed that the value of preventing a single

¹⁶ Department of National Defence, Defence Enterprise Risk Management Policy, Chief of Program, (Ottawa, DND Canada 2018).

¹⁷ For example, when new technologies emerge that reduce the risk of threats such as better materials to protect from explosive blasts, improved body armor or more reliable aircraft safety systems.

¹⁸ Government of Canada, "Canada's Cost-Benefit Analysis Guide for Regulatory Proposals," last accessed 15 November 2022, <https://www.canada.ca/en/government/system/laws/developing-improving-federal-regulations/requirements-developing-managing-reviewing-regulations/guidelines-tools/cost-benefit-analysis-guide-regulatory-proposals.html>.

¹⁹ Cumulative inflation rate calculated to be 36.7% using <https://www.bankofcanada.ca/rates/related/inflation-calculator/>, last accessed 9 February 2023.

fatality should be set at \$8.9 million CAD for the purposes of CBAs for CAF safety improvements.

14. As a brief comparison with our allies, the UK MOD have adopted the ALARP concept²⁰ within their Regulation in order to be in compliance with their Health and Safety at Work Act 1974.²¹ The UK MOD employ a very similar approach to what is proposed above. Commanders are required to demonstrate that risk has been mitigated to an ALARP level which the UK MOD define as the point in which any further investment in safety is grossly disproportionate to the level of safety gained.²² In doing so, they have not only made commanders accountable for ensuring safety initiatives are always fully evaluated, but they have indirectly contributed towards their Shield Function which enhances their war fighting capability. The CAF should consider following a similar approach by adopting the recommendations in this paper.

15. Finally, it should be noted that the US Military have recently started to explore the concept of CBAs to justify resource allocation when emerging safety initiatives are brought forward.²³ While they do not apply the ALARP concept directly, this emerging work from the US Navy Post Graduate School indicates that CBAs provide a powerful tool in resource allocation when faced with restricted budgets.

CONCLUSION

16. CAF doctrine is clear on a Commander's responsibility to mitigate risk to their personnel, and to ensure a safe workplace. While doctrine does not capture the, "how," it addresses the fundamental requirement of risk mitigation under the Component Function of Shield for the CA and RCAF and LEADMARK 2050 for the RCN. Commanders face a challenge in that the doctrine does not provide sufficient guidance to determine the level of risk mitigation required. While this is currently subjective, the commander must, in all cases, recognize that the safety of their personnel is instrumental in achieving a capability, and that preventable deaths and injury are not only unacceptable from a societal perspective, but also captured as a commander's responsibility under CAF doctrine.

17. CAF policy provides guidance to Commanders on risk management, but it is not clear on how much mitigation should be applied, nor whether emerging technological advancements in safety require investment to reduce risk. Exploiting technological safety improvements should be reviewed in every instance and an ALARP argument made to assess whether the investment is worthwhile. An opportunity exists to leverage TB policy by applying a VSL concept to justify the benefit in lives potentially saved that the new technology brings.

²⁰ RA 1210 – Ownership and Management of Operating Risk (Risk to Life), United Kingdom Ministry of Defence, last accessed 29 November 2022.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1108245/RA1210_Issue_6.pdf.

²¹ Reducing Risks, Protecting People, Health and Safety Executive Decision-Making Process, last accessed 20 February 23, <https://www.hse.gov.uk/managing/theory/r2p2.pdf>.

²² Reducing Risks, Protecting People, Health and Safety Executive, "Cost Benefit Analysis Checklist," last accessed 1 February 2023.

²³ CHRIS ROHLFS and RYAN SULLIVAN, "The Cost-Effectiveness of Armored Tactical Wheeled Vehicles for Overseas Us Army Operations," *Defence and Peace Economics* 24, no. 4 (2013), 293-316.

18. C Prog is perfectly placed as the CAF's delegated risk officer, to take the lead in establishing additional guidance, as well as a funding streams, to assist commanders in mitigating risk across the Elements. C Prog has the mandate to empower commanders and ADM(Mat) personnel to exploit technological advancements in safety, and reduce risk to personnel, thereby enhancing the CAF's future warfare capabilities.

RECOMMENDATION

19. The ALARP concept should be captured within existing risk management policies for each of the CAF Elements. C Prog, as the CAF Risk Officer, should take the lead in liaising with each of the Elements and providing subject matter expertise to ensure the ALARP concept is captured consistently across the CAF.

20. A standalone budget should be established for safety related initiatives. C Prog should manage this budget and liaise directly with ADM(Mat) to prioritize the projects that are funded under this budget.

21. Commanders and ADM(Mat) personnel should develop their ALARP arguments using CBAs, and a VSL from TB policy, to help justify safety improvements. CBAs should be supported by qualitative assessments of the risk, and should be evaluated and prioritized by C Prog for the CAF. Such a process will ensure risks are evaluated evenly across each of the CAF's Elements.

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