



**NAVIGATING THE PERFECT STORM:
AN ALTERNATIVE CREWING AND SHIP READINESS
MODEL TO KEEP THE RCN RELEVANT**

Lieutenant-Commander Mark McShane

JCSP 50

Service Paper

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CANADIAN FORCES COLLEGE - COLLÈGE DES FORCES CANADIENNES

JCSP 50 - PCEMI n° 50
2023 - 2024

Service Paper – Étude militaire

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AIM

1. This paper will propose an alternative crewing and maintenance model for Royal Canadian Navy (RCN) ships, allowing for longer and more frequent ship maintenance periods, regulating personnel tempo, and relieving the strain on the most critical trades such as Maritime Technician (MARTECH). It will focus on the current and near future fleet (including Joint Support Ship (JSS)). It could equally be applied to the Canadian Surface Combatant (CSC) when it becomes operational.
2. This paper will serve as a foundation, a launch pad for a new way of managing personnel and ship readiness in the RCN. As such, the scope is large, and the intricacies and interplay amongst RCN departments, trades, training, etc. is likely significant. Further study will be required to identify additional friction points and challenges, and to minimize or mitigate them prior to implementation.

INTRODUCTION

3. The RCN is attempting to navigate the perfect storm. A lack of trained personnel in critical trades, poor retention and recruiting, and the combatant workhorse frigates are at the end-of-life with a replacement years away. From a retention point of view, the RCN has not “deliver(ed) enough recruits for the past 10 years”¹, and the resultant strain and operational tempo on healthy sailors is exacerbating the problem. The best-case scenario states it will be more than a decade before the Navy can recover from a personnel standpoint², whereas the most likely scenario is it will take much longer. With regards to equipment, the “newest” CPF is 28 years old, and nearing the end-of-life extension which resulted from Halifax Class Modernization in the mid 2000s³⁴. The National Shipbuilding Strategy (NSS) is starting to deliver non-combatant ships such as Arctic Offshore Patrol Ships (AOPS) (4 of 6 delivered as of writing) and JSS (RCN delivery scheduled for 2025), however, as the only combatant, the Canadian Patrol Frigate (CPF) *must* remain operational upwards of 15 years before sufficient numbers of its CSC replacement are deployable. Maintenance periods for the CPF are becoming longer and more frequent, making less CPFs available for operations. For the ships that

¹ Joe Saballa, "Canadian Naval Readiness in "Critical State": Commander," (November 30, 2023). <https://www.thedefensepost.com/2023/11/30/canadian-navy-readiness-critical/>.

² Joe Saballa, "Canadian Naval Readiness in "Critical State": Commander," (November 30, 2023). <https://www.thedefensepost.com/2023/11/30/canadian-navy-readiness-critical/>.

³ McClearn, Sandy. "Naval History - Halifax Class Frigate."

⁴ "Halifax Class Modernization/Frigate Life Extension (HCM/FELEX)," , <https://www.canada.ca/en/department-national-defence/news/2016/11/halifax-class-modernization-frigate-life-extension-felex.html>.

are operational, equipment repair and maintenance is more demanding, serving a negative impact to stressed MARTECHs. Workloads continue to increase exponentially as crews fight to keep ships at sea.

4. This comes at a time when Canada needs an operational Navy. Global merchant shipping is being attacked in the Red Sea, China has publicly signalled its intent to take Taiwan, and many of Canada's interests in the indo-pacific and across the globe are being threatened. The government of Canada's demands will continue to rise with global instability and conflict, and the RCN must adapt to meet these challenges. A complete overhaul of the RCN crewing and ship readiness model is the most critical step to be ready for what is to come.

DISCUSSION

5. ***The Current Model.*** Currently, the RCN posts one crew to each ship. The crew is augmented by an Air detachment and/or other specialized personnel. For simplicity, this paper will focus on the East Coast (MARLANT) and not account for augmentees that come from other elements such as the Air Force. This paper will not address submarines. Maritime Coastal Defence Vessels (MCDVs) will be discussed and the model can be applied to them, however, they are not addressed in Tables 1 & 2 (Annex A & B respectively).

6. ***The Issues.*** At full readiness, MARLANT would need to crew upwards of seven CPFs (Crew complement 225), six MCDVs (Crew complement 45), three AOPS (Crew complement 65), and 1 JSS (stationed East as of 2027) (Crew complement 199)⁵. Without examining specific trades or accounting for ships in long-term refit that may not have a full crew posted, the current crewing model requires 2239 personnel for maximum readiness. This is not achievable. Studies have been completed by Defence Research scientists (DRDC) for all classes of ship using SCORE software, with algorithms that account for sleep cycles, watch & station bills, the types of operations and numbers required for them, and damage control requirements⁶. Optimally, all billets in a ship should be filled to maximize operational readiness and effectiveness, and to disperse workload evenly over an appropriate number of personnel. Although there are fewer ships and personnel on the West Coast (MARLANT), the same issues apply, and the proposed model would be mirrored with minor adaptations to that fleet.

⁵ "Surface Fleet," <https://www.canada.ca/en/navy/corporate/fleet-units/surface.html>.

⁶ Dennis Witzke and Ramona Burke, "A Systems Approach to Naval Crewing Analysis: Coping with Complexity," *Canadian Naval Review* 11, no. 3 (2016), 16-21. https://cradpdf.drdc-rddc.gc.ca/PDFS/unc227/p803787_A1b.pdf.

7. The RCN is over 1500 trained officers and NCMs short, an increase of almost 1,000 since 2019⁷. Recruiting falls short annually, and there are significant retention problems in critical trades such as MARTECH⁸. According to a 2022 personnel snapshot of MARLANT, approximately 25% of NCMs have medical limitations (MELs); almost 750 of the 3,100 sailors on the coast⁹. Although not all of these members are “unfit sea”, a great number of them can not sail¹⁰. Additionally, due to crewing shortfalls across the Navy, even when a ship is not sailing, sailors are required to “pier-head jump” to other ships to fill critical empty billets due to a lack of trained personnel and/or replace sailors not available due to MELs. These sailors become overworked, “...“burning out” and either releasing or working with medical limitations, preventing them from going to sea”¹¹. It is a circular problem that is exacerbated with each instance.

8. According to the MARLANT Sea Days schedule for fiscal year 2023, East Coast ships averaged only 59 days at sea¹². Those numbers are skewed further, when it is shown that many of those sea days were accounted by MCDVs, Asterix, and AOPS, and not the RCN’s only combatants. As previously discussed, the CPF is at the end-of-designed life, and the amount of downtime, and cost to keep them operating while bridging the CSC gap is significant.

9. ***The Requirements.*** The Force Posture and Readiness (FP&R) Directive¹³ requires that the RCN have, at a minimum, the following on each coast:

- a. one ship to serve as Ready Duty Ship;
- b. one Frigate at high readiness (HR) to serve as a Single Ship International Deployer;
- c. one submarine at HR;
- d. one submarine at normal readiness (NR);
- e. one of the Strong, Secure, Engaged (SSE) -defined Task Groups at HR.

This is currently not achievable due to the requirement for a Naval Task Group. Notwithstanding submarines which are a completely separate issue, the proposed crewing model will allow for all readiness directives to be achieved, enabling the RCN to deploy up to two Naval Task Groups (1 x East & 1 x West) simultaneously. It should be noted

⁷ Canada. Department of National Defence. *Establishment and Strength Report* DGMPPRA, [2023]

⁸ Ibid.

⁹ Personnel Coordination Center Atlantic, *Fleet Snapshot, MARLANT*, (2022).

¹⁰ Joanne Anderson, Erin Wing and Inez Dekker, "Retention and Attrition in the Hard Sea Occupations," *Defence Research and Development Canada Scientific Report DRDC-RDDC-2018-R307* (2018). https://pubs.drdc-rddc.gc.ca/pubdocs/pcow1_e.html.

¹¹ Hartzell, Cdr Stephanie. "Personnel Challenges Faced by the RCN," *JCSP Service Paper* (2022). <https://www.cfc.forces.gc.ca/259/290/24/192/Hartzell.pdf>.

¹² MARLANT, *Sea Days for Schedule MARLANT* MARLANT, [2023]).

¹³ Canada. Department of National Defence. "Evaluation of Ready Naval Forces," <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/audit-evaluation/evaluation-ready-naval-forces.html>.

that SSE¹⁴ defines a Naval Task Group as four FFH/CSC and JSS. This model currently supports a Naval Task of 2 x CPF, 2 x AOPs, and JSS on each coast for 18 months of a 24-month period. In the future, with 15 x CSC operational, the Naval Task Groups could meet the requirement as currently defined in SSE.

10. **Model Introduction.** The concept of rotational crewing was historically implemented to maximize the amount of time a ship could operate overseas and is most commonly employed by the United States Navy (USN). Blue & Gold crews would be posted to a single ship and the crew would rotate every few months; allowing the physical ship to remain abroad while crews alternated to allow for training and recovery time while away, and sustained operations while at sea¹⁵. Although this new model will employ a rotational crewing concept, it will have the very opposite goal; to allow physical hulls frequent and longer maintenance periods than are currently afforded and allow personnel to observe consistent routine and battle rhythm that includes a dedicated recuperation period, and guarantees a high readiness deployment opportunity every 18 months which can contribute to higher retention rates.

11. **Proposed Crewing and Ship Rotation model.** Unlike the USN model which has crews rotate on one specific ship, this new model will rotate both crews and hulls; allowing a crew's operational tempo to match that of a particular hull until both crew and ship enter a maintenance and/or recuperation period. Hulls entering this period will remain in extended work periods of 18-24 months, allowing the RCN to conduct the significant maintenance required to keep the CPF operational. Personnel will continue to rotate on an 18-month cycle that is modelled after CANSOFCOM personnel tempo. Sailors will be posted to class-specific crews (CPF/AOPS/MCDV (if desired)), and not specific hulls as in the past (with the exception of JSS as there will only be one hull per coast). The crew rotation will be 6 months at Standard Readiness, 6 months at High Readiness (optimally deployed), and finally 6 months for training, personal development, recuperation and downtime. This cycle allows sailors to maintain a consistent operational tempo, gain consistent deployment opportunities, and receive low tempo/training & downtime periods with a primary goal of recuperation and re-connecting with families (all contributors to increased retention). Supervisors must support and enforce this goal for the model to be successful. Ultimately, MARLANT requires three CPF crews, three AOPS crews, and one JSS crew (Annex B) to enable at least 1 x HR CPF deployer, 1 x SR CPF, 2 x SR AOPS (with the ability to have a HR deployer on the same cycle as CPF if desired), and JSS (SR or HR) in its own rotation (Annex A).

¹⁴ Canada. Ministry of National Defence. *Strong, Secure, Engaged: Canada's Defence Policy*, 2017.

¹⁵ US Government Accountability Office, "Littoral Combat Ship: Deployment of USS Freedom Revealed Risks in Implementing Operational Concepts and Uncertain Costs," (July, 2014).
<https://www.gao.gov/assets/gao-14-447.pdf>

12. ***The Advantages.*** Aside from the advantages of maximizing maintenance windows for CPFs (and maintaining adequate windows for the new AOPS and JSS), there are additional benefits. First, pier-head jumping should be minimized, and optimally non-existent. Crews would remain with one ship class and become experts in that class. Second, crews would remain consistent, and as a result, teams would be built and remain together, with a similar posting tempo as in the current fleet. Although the hull may be different, the highly trained team will remain intact. Third, where there may be some unique features in some hulls of same class, a crew would have a full 6 month SR period to fully understand any appreciable differences prior to HR and deployed operations.

13. When a ship is in long work periods, the crew is typically employed in a shore office where sailors are often used as a manning pool to supplement the remainder of the fleet. The current model forces the RCN to have either an underemployed crew for a large percentage of the year, or sailors who are extremely overworked as they are poached from ship to ship. Ship maintenance periods (Short, Extended, Dock) are scattered throughout the year, with the only consistent operational period being a deployment. This lack of rhythm also has a negative impact on ships as there is often not enough time in a specific work period to complete the necessary work, which can result in ships either being unable to sail when they should, or additional wear and tear is put on equipment that was not addressed in the allotted maintenance period. The proposed ship and crew rotation plan addresses both issues.

14. This model is not intended to be a temporary fix. Properly implemented, it could be used indefinitely, allowing for consistent, non-reactive maintenance periods for all hulls, while maximizing the number of ships that are serviceable. Additionally, the scalability of the model allows for greater numbers of ships to be used in the operational rotation if sufficient numbers of trained personnel increase in the future. As CSC slowly replaces CPF and long maintenance periods are no longer required, more hulls would be available for operations. This period will likely coincide with greater numbers of trained personnel being available to crew these ships as recruiting and retention initiatives take hold.

15. ***The Challenges.*** The most significant obstacle to this proposal is that FMFs do not currently have the capacity to do the additional work to support the proposed ship rotation. It is understood that a significant investment of time, people, and money will be required to keep the CPFs operational over the next 15 years, and therefore the gap may be less than at first glance. To accomplish this, a significant civilian workforce would need to be hired on both coasts. Furthermore, the intent is that out-of-routine ships will not have duty watches or engineers/technicians available for routine maintenance. Therefore care and custody of out-of-routine ships would need to be taken over by FMF or ADM(MAT), and then returned to the Navy shortly before its new crew begins a short shakedown/sea trial period in advance of SR Work-ups. The bottomline is that this investment is necessary to maintain the CPFs whether or not there are changes to the current maintenance schedule. As hulls and equipment continue to degrade, additional

work and cost will be necessary. Additional study is required to identify the extent of this gap, numbers of civilians required to take on the additional work, physical yard capacity, etc.

16. There are other disadvantages that should be noted as well. First, engineers and technicians posted to a specific hull for years will gain deep knowledge of that ship's unique issues. In this model, that deep knowledge will be lost and/or not transferable to the next hull in rotation. Significantly longer work periods for all hulls will likely minimize the impact of this issue. Second, there may be a loss of pride in a specific ship (particularly for NCMs, who are typically posted to a specific ship for many years). This may occur, however, because the core crew remains intact, and sailors will remain with the hull for a year through both SR/HR periods, any loss in ship pride would be minimal. Third, one issue noted in a USN study on rotational crewing models, was a decline in ship's husbandry which may have resulted from quick crew rotations and a lack of "ownership"¹⁶. This could result but impact would likely be minimal due to a cohesive crew remaining together.

CONCLUSION

17. The RCN fully understands the challenges of today and tomorrow, but the current global landscape does not allow for inaction. For the RCN to remain relevant, it must be able to project Canadian values, and defend its interests at a time when global conflict is arguably imminent. The two greatest threats to RCN effectiveness are not having the ships to do the business, and not having the crews to sail them. Waiting for more than a decade for new ships, and 'hoping' that recruitment and retention problems are fixed in the years to come are not an option. As Canada's interests are being attacked directly/indirectly, it is not reasonable to be "Ready aye Ready" a decade from now at the expense of today's threat.

18. This paper highlighted that an overhaul of the current system is the only way to address the threats to RCN relevance; keeping an ancient fleet operational, and taking care of the sailors that are critical for all operations. By upending the way things have always been done and implementing a set (yet scalable) rotation of ships and crews, and demanding a consistent personnel op tempo that allows sailors to do the work they signed up for, while enforcing better work-life balance; improved recruiting, retention and ship availability will be achieved.

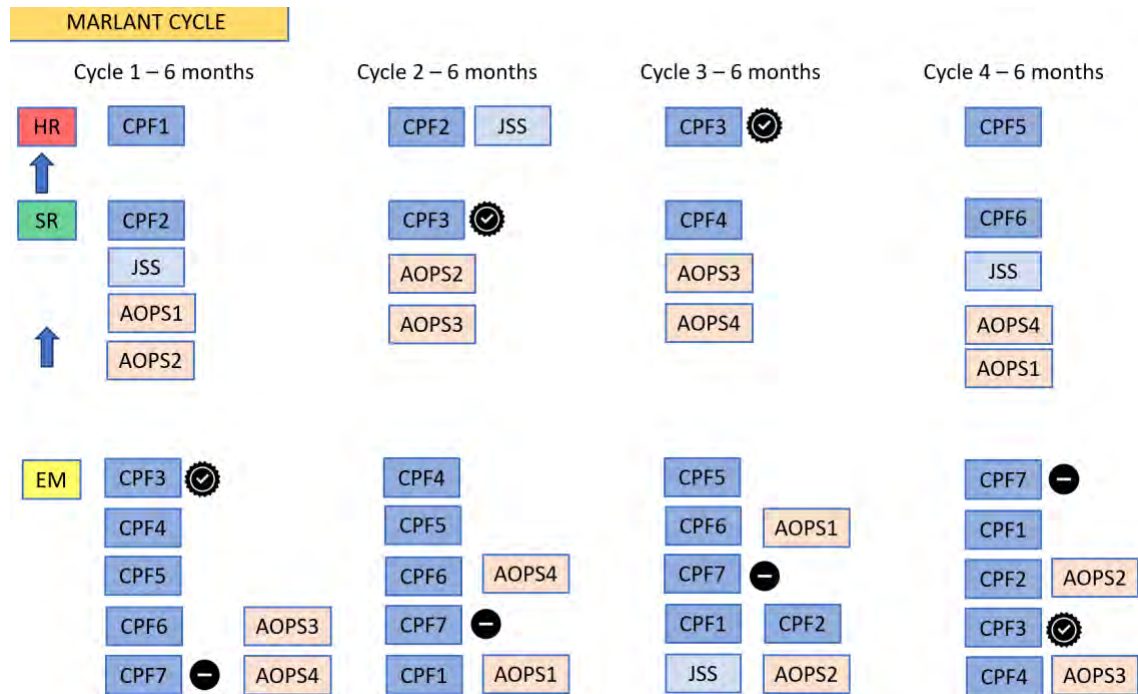
¹⁶ Congressional Budget Office of the United States, "Crew Rotation in the Navy: Long-Term Effect on Forward Presence," (October, 2007).
<https://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/87xx/doc8771/10-31-navy.pdf>

RECOMMENDATION

19. Recommend CRCN direct an immediate follow-up/feasibility study to identify and verify potential issues with regards to personnel (trade specific training and timelines, trade specific trained personnel numbers, ship/team training requirements), and other areas that may be impacted and/or require alteration. Additionally, investigate the impact of amending current contracts and investigating shipyard availability to take on additional maintenance (Irving/Vancouver and Victoria Shipyards/East and West Coast FMFs) that would be affected by an overhaul of the current long-term work period schedules.

Annex: A.

Table 1. *Proposed Ship Rotation Model.*



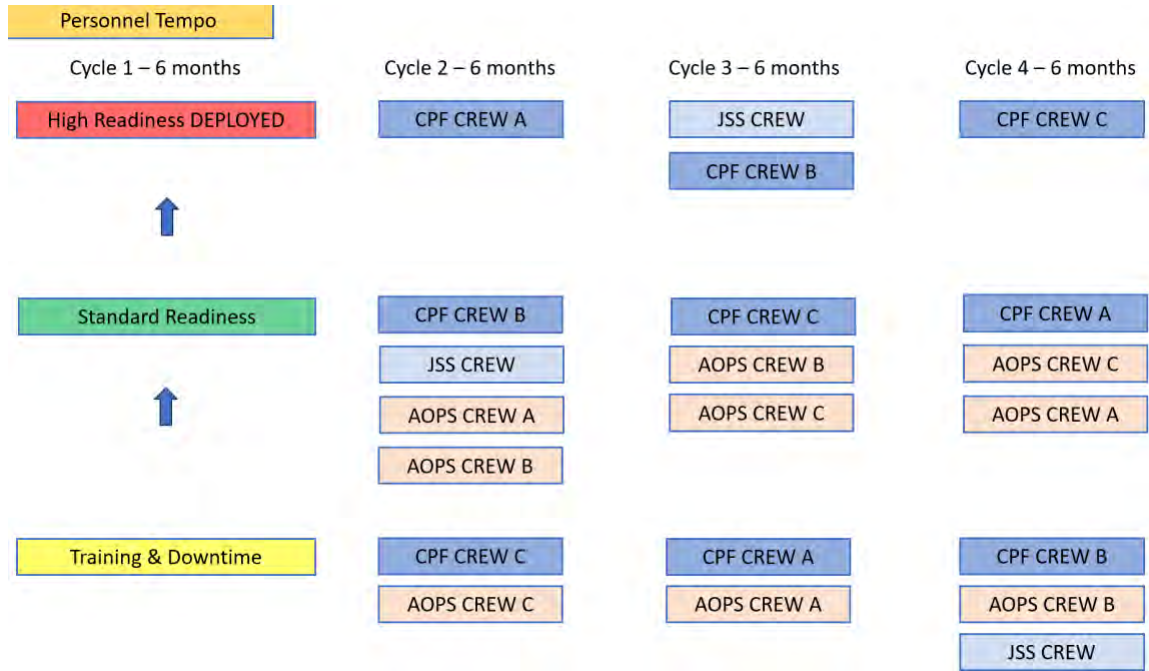
This chart portrays a typical 18-month operational cycle, allowing for a personnel tempo that matches the ship class (6-month SR/6-month HR/6-month individual/team training, personal development, downtime). From an equipment standpoint, it allows for maintenance periods of up to 2 years for CPFs, 6 months for AOPS, and 6 months for JSS. MCDVs would have a similar rotation. Throughout the 18-month cycle, 1069 personnel would be required for all crews, 779 of those sea-going at any one time. All ships would be crewed to 100% without attach postings. This compares to over 2000 personnel required to crew all ships with upwards of 20% attach postings currently.

⊖ One CPF would be available for Extended Maintenance for up to 2 years, while remaining CPFs would be available for Extended Maintenance up to 18 months.

⊙ Example of tempo for CPF 3, which would have one CPF crew assigned to it through the 18-month cycle. That crew would then take CPF7 in the next rotation (not shown)

Annex: B.

Table 2. *Proposed Crew Rotation and Tempo.*



This chart depicts the Crew Rotation model required to support the ship rotation model in TABLE 1.

CANSOFCOM, and other smaller elements of the Army and Air Force employ an 18-month rotational personnel tempo. 6 months for training, personal time and recovery, 6 months for the equivalent of Standard Readiness which could include more advanced training, and medium tempo operations, and lastly 6 months of high readiness deployed operations. Personnel would be posted to a CPF crew, AOPs Crew, JSS Crew, and cycle through at the same tempo as the ship, regardless of a specific hull. JSS with only one hull per coast would have only one crew, therefore following the tempo of the ship.

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