



# HARBOURING TALENT

Investigating the Recruitment and Retention  
Dynamics of Technicians in the RCN

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## Investigating the Recruitment and Retention Dynamics of Technicians in the Royal Canadian Navy

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## Abstract

This paper investigates the recruitment and retention challenges of technicians within the Royal Canadian Navy (RCN). Technicians, who perform essential roles both at sea and ashore, comprise a significant portion of the RCN workforce and are critical to operational readiness and future technological advancements. The research examines factors such as pay and compensation, organizational culture, work environment, and leadership compared to civilian industry standards. Through quantitative data analysis and case studies from retired RCN members, the study identifies structural labor shortages and highlights the lived experiences of technicians, shedding light on recruitment bottlenecks and retention difficulties.

Key findings reveal disparities in compensation, work-life balance, and career development opportunities between the RCN and civilian sectors. The report argues that these challenges are exacerbated by generational shifts in workforce expectations, including preferences for flexibility, autonomy, and purpose. The RCN's technical workforce often faces heightened workloads, bureaucratic obstacles, and a cultural gap that misaligns with their professional goals and cognitive motivations. Additionally, the paper explores the increasing demand for specialized technical skills driven by new technologies and platforms, emphasizing the need for a robust strategy to attract and retain talent.

Recommendations center on structural changes to pay systems, introducing skill-based compensation, enhancing leadership styles, and promoting recognition of technicians' contributions. The proposed strategies aim to align the RCN with evolving labor market dynamics while addressing the unique demands of military service. The research underscores the urgency of systemic reforms to ensure the RCN's long-term capability and readiness as it transitions to a more advanced fleet.

## Key Recommendations

### Pay and Compensation

- Modify sea duty allowance (SDA) such that it is linked to time away from home and increase the rate such that it is more comparable to the “overtime” worked.
- Modify special leave (mission) to take into account the net amount of time away from home and grant members' time in lieu accordingly.
- Modify the specialist pay incentives such that there is an element of skill-based pay and such that pay is reactive to the supply and demand fundamentals of the competitive job market.
- Implement a financial retention incentive that is reactive and flexible and can be targeted to the specific qualifications, skills and rank levels required.

### **Work Environment and Quality of Life**

- Balance workload alongside amongst all occupations.
- Provide more meaningful work and create conditions that allow technicians to spend more hours of their day performing technical work.
- Provide better recognition, whether through the existing honour and awards system or via new mechanisms to sailors preparing for operations.
- Track and communicate HR initiatives that are being considered or worked on in an easy-to-find and consolidated fashion.

### **Leadership and Purpose**

- Cultivate a servant style of leadership where supervisors are primarily supporting the members doing the physical work.
- Clearly articulate a purpose that is likely to resonate with junior sailors.

# Contents

<b>What is a Naval Technician?</b>	<b>1</b>
What Makes STEM and Trades Unique?	3
<b>The Problem</b>	<b>4</b>
An Institution in Decline?	4
<b>The Root Causes - Pay and Compensation.</b>	<b>8</b>
Comparison Methodology	10
Comparison to the Canadian Coast Guard	13
Comparison to BC Ferries	14
Comparison to Red Seal	15
Compensation vs Benefits	17
<b>Root Causes: Work Environment and Quality of Life</b>	<b>20</b>
STEM Workers in the Defence Workforce	21
Gen Z and Millennials in the Defence Workforce	22
Work Environment Compared to other RCN Occupations	22
Work Culture Compared to other RCN Occupations	23
<b>Root Causes – Leadership and Purpose</b>	<b>26</b>
Leadership for a STEM Workforce	26
Leadership for a Gen Z and Millennial Workforce	27
Purpose	28
<b>Solution Space: A General Framework</b>	<b>29</b>
Pay and Compensation	29
Work Environment and Quality of Life	30
Leadership and Purpose	30
<b>Specific Recommendations</b>	<b>31</b>
Pay and Compensation	31
Work Environment and Quality of Life	32
Leadership and Purpose	33
<b>Conclusion</b>	<b>33</b>

**R**oyal Canadian Navy (RCN) technicians serve at-sea in ships and submarines where they operate and maintain the Navy's vast and complex array of equipment. This work is the backbone of modern naval operations – equivalent to the civilian mechanics, electricians, welders, pipefitters, machinists, computer network technicians, and telecommunications technicians that keep society running everyday. Technicians also work ashore, within the fleet maintenance facilities, within training establishments, the material group, and other Department of National Defence (DND) organizations. They currently comprise roughly half of the Naval workforce and are vital to the RCN's operational readiness and future projects. With the introduction of the Canadian Surface Combatant (CSC) and the AEGIS integrated combat system, the number of highly specialized technicians in the RCN will only grow.

The critical importance of the RCN's technicians – and the time required to train them – makes this profession a particular bottleneck in the Navy's attempts to fix its critical human resources issues. This paper explores recruitment and retention challenges for RCN technicians by comparing pay and compensation, organizational culture, work environment, and leadership across multiple industries. Using a combination of quantitative data and case studies collected from recently retired members, it seeks to illuminate not only the facts but also highlight the lived experiences of sailors. Ultimately it argues for structural changes to bolster the RCN's current operational readiness while preparing it for the technological leap of the future fleet.

### **What is a Naval Technician?**

A technician is defined by the Cambridge dictionary as “a worker with special skills, especially in science or engineering.”<sup>1</sup> Specifically, technicians have intersecting skills across fields of science, technology, engineering and math (STEM) and their associated trades. Both STEM and trade workers are in high demand and the intersection of these two domains is extremely competitive, and it is in this space the RCN is competing for talent.

The current Regular Force (RegF) RCN managed workforce as of the end of fiscal year 2024 consisted of 7,933 positions, officers and non-commissioned members (NCM). This is what the RCN calls the RegF Trained Effective Establishment (TEE), which is defined as: “all accountable military positions ... designated to be filled by military members who have attained OFP.”<sup>2</sup> The Occupational Functional Point (OFP) “occurs when a member completes all qualifications required for first employment in the occupation.” This means that TEE does not include training positions on the Basic Training List (BTL) but rather all the positions that the RCN has deemed necessary to fulfill its mandate.

Out of these 7,933 positions, 6,235 are NCMs which is largely where technicians come from. Currently, the Marine Technician (Mar Tech) and the Weapons Engineering Technician (W Eng Tech) are commonly accepted to be members of the technical community. A Mar Tech maintains the propulsion plant and auxiliary systems and is comparable to a civilian red seal electrician or heavy-duty technician. A W Eng Tech maintains weapon and control systems, such as radars and combat suites, and could be compared to a control technician or network technician.

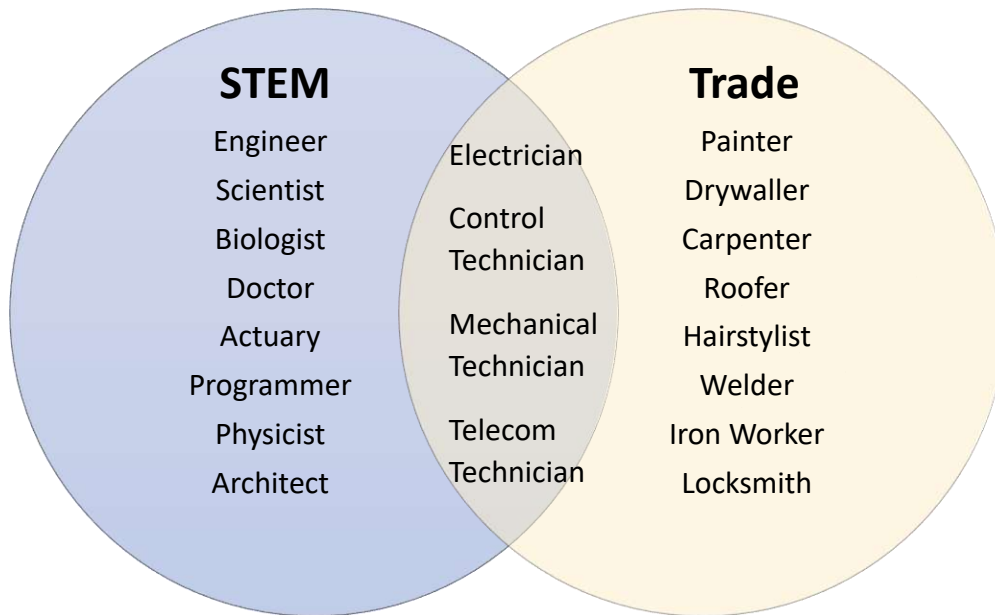


Figure 1 - Intersection of STEM and Trade<sup>3</sup>

Mar Techs have a TEE of 1,920 positions and W Eng Techs have a TEE of 1,153 positions.<sup>4</sup> This means that, combined, they account for 49% of the total RCN NCM population. This is a higher percentage of technicians than both the Canadian Army and RCAF, meaning the RCN is the service, most affected by the challenges of attracting, recruiting, employing, and retaining a technical workforce.

One path forward would be to include Naval Communicators (Nav Comm) within the technical community. At the Sailor First Class (S1) and the Master Sailor (MS), rank levels have duties that include: “intermediate to advanced levels of network resource and account management, software/hardware installation and configuration, network performance monitoring, replication and bandwidth management, life-cycling, fault finding and rectification, first line maintenance, disaster recovery, web publishing and management, and maintaining Information Systems security.”<sup>5</sup> The troubleshooting, software/hardware configuration, and 1<sup>st</sup> line maintenance aspects of the job certainly align with those of a civilian network technician.

The percentage of time a sailor spends on technical functions is not an important determinant as to whether they should be classified as a technician. The important factor is whether technical aptitude is required for that sailor to reach their OFP. If those aptitudes and characteristics are required then the RCN is competing within the STEM/Trade labour space for that talent, regardless of how the RCN employs those individuals day to day. If Nav Comms with a TEE of 787 positions are included in the RCN’s technical community, then membership grows to 3,860 positions or 62% of the NCM workforce.

Although analysis is still ongoing, large-scale changes may be required of the combat operator community to better prepare them for the Canadian Surface Combatant (CSC). The CSC will be

equipped with AEGIS and the RCN will probably adopt a similar employment model to that of the United States Navy (USN). The USN uses a model of technician/operator in their crewing construct, meaning that all combat operators are technicians first. The Navy’s draft “Concept for RCN Crewing” document states that “Technological advancements in future warfare tools will require operators and technicians to have more technical and tactical understanding of the equipment they are utilizing. Therefore, adopting a maintainer/operator structure is advantageous to the RCN construct and allows for more flexibility in crewing options of all platforms.”<sup>6</sup> If the RCN were to include the combined 1,232 combat operator positions, then technicians would account for 5,132 of the total 6,235 positions or 82% of the NCM workforce.

The actual number of technicians the RCN requires is likely somewhere between the low-end estimate of 49% of the workforce and the high-end estimate of 82% of the workforce. Still, the important takeaway is that regardless of where that number currently sits, the trend is upwards as new technologies and platforms are introduced. Naval communicators are more likely to trend toward being network technicians than they are to revert to signalers. Combat operators are increasingly likely to require technical aptitude in the future than not. Therefore, the RCN needs to become better prepared to compete for, manage, and lead a technical workforce.

NCM Occupations within the RCN

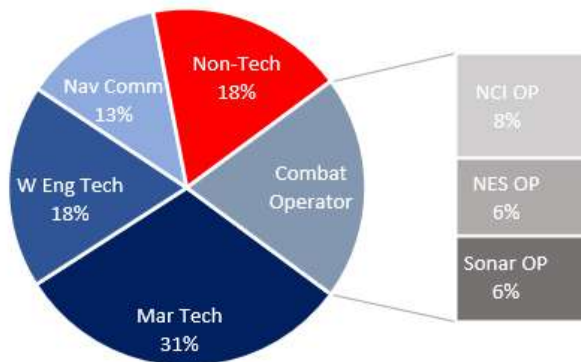


Figure 2 - NCM Occupations Within the RCN

**What Makes STEM and Trades Unique?**

STEM was first used to describe a loose grouping of curricula within an educational setting, but in its expanded use, the term now describes careers within the technology sector. As mentioned earlier, demand for skilled workers is high. Employment and Economic Development Canada (EEDC) uses a Canadian Occupational Projection System

(COPS) to “project labour demand and labour supply, and identify market imbalances.”<sup>7</sup> The projections for 2022-2031 identify structural shortages in many STEM jobs.<sup>8</sup> The situation in the US is similar, as the growth rate across STEM occupational groups is forecasted to be above the national average while the replacement rate is forecasted to be lower than the national average.<sup>9</sup> As a result, the RCN is in direct competition for STEM labourers with other public and private sectors suffering similar structural labour shortages. This shortage is only exacerbated by a similar dearth of skilled tradespersons.

Trades refer to any occupation that holds a specialized skill, often, but not always, gained through experience, apprenticeship, and on-the-job training (OJT). Trade jobs are another high-demand sector and Canada is not generating enough skilled workers despite the pay premiums available. Indeed, the government of Ontario estimates that by 2026, one in six job openings will be in trades.<sup>10</sup>



Given that both STEM and trade jobs are in high demand, it is reasonable to assume the intersection of the two groups will be in the greatest demand. This is the labour pool that RCN needs to compete for to attract technicians. In the context of the CAF, where pay is rank-based, not skill-based, it is logical that the organization will have a more difficult time recruiting STEM/trade candidates who would otherwise be compensated at higher levels in the private sector.

## The Problem

### An Institution in Decline?

The RCN is not ignorant to the difficulties that these employment dynamics create. The Minister of National Defence (MND) recently confessed that the military was facing a “death spiral.”<sup>11</sup> To understand and quantify that “death spiral,” we can look at personnel trends between 2020 and 2024, based on data provided by Director General Military Personnel Research and Analysis (DGMPPRA), which is updated monthly. The data point for each reference year is taken from the end March report, which coincides with the end of DND’s fiscal year (FY). At the time of writing, the latest report that was available was the March 2024 report. Going back further than five years proved difficult as some of the metrics being measured changed over time. However, the five-year period between 2020 to 2024 provides consistent data from which a trendline could be derived.

Extracting data from the Establishment Strength Report (ESR) the Trained Effective Strength (TES), which is how many trained personnel are in the CAF, can be compared to the TEE positions going back to 2020. This data is broken down by occupation, and the dataset used in this chapter is all RCN NCM positions. The blue bar shows a declining TES year over year. The grey bar shows that from 2020 to 2022 the TEE was mostly steady. But in 2023 the TEE grew from 5927 to 6091 positions. Between Apr 2023 and Mar 2024, the TEE once again increased to 6235. This means the RCN is attempting to grow the size of the establishment during a time of declining membership. The trendline in red is the percentage of the TEE filled, which is a simple mathematical calculation of TES divided by TEE. The steep decline from 2022 to 2024 is a result of both a decline in TES and a simultaneous increase in TEE.

DGMPPRA also breaks down the monthly TES and TEE numbers by occupation. This allows a graph to be produced for each individual occupation using the same methodology. It is beyond the scope of this paper to breakdown every occupation so in most cases the Mar Tech occupation was used as the example. There are several reasons for opting to use Mar Techs. It is currently the largest single occupation in the RCN, accounting for 31% of the RCN NCM total, it is currently the most understrength occupation at senior levels, and it is the technical occupation that aligns the closest with a direct industry equivalent.

By analyzing data for each occupation individually, further inference and comparisons can be conducted. For example, the Mar Tech and W Eng Tech TES% can be compared to the RCN baseline. The below graph compares the RCN baseline TES (%) to the technical occupations. What it shows is that although the RCN’s TES has been in steady decline, the technical occupation’s TES is consistently 5-10% lower than the RCN non-tech average.



Figure 3 – TES vs TEE for RCN NCM<sup>12</sup>

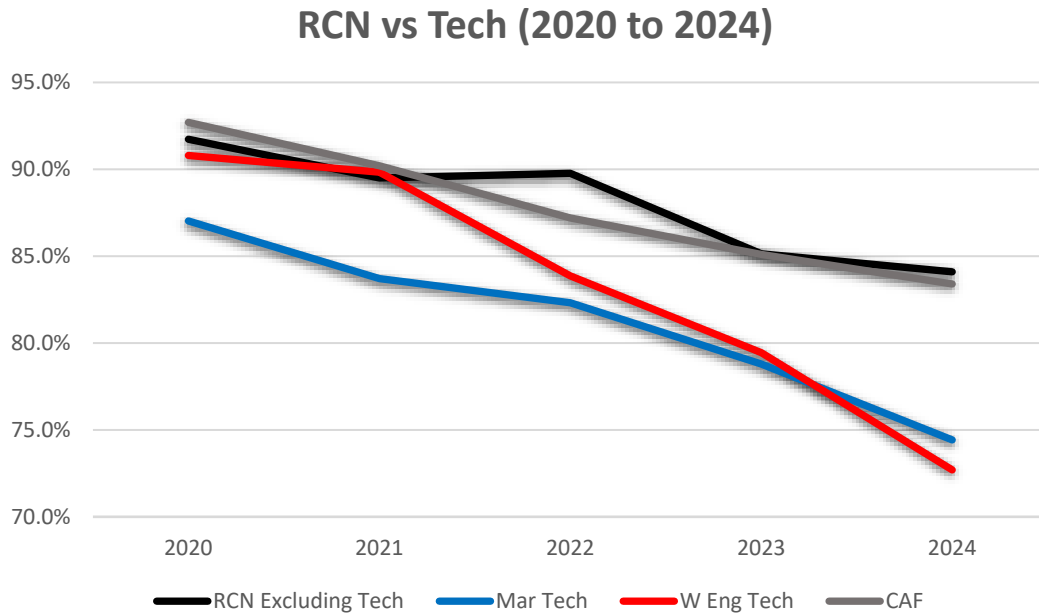


Figure 4 - RCN TES vs Technical Occupation TES<sup>13</sup>

The data does not show why technical occupations are finding it more difficult to recruit but it can assist in establishing a pattern. Even though a 10% difference is significant, the results are even more drastic when analyzed by rank. The DGMPPRA data, specifically the ESR annex does break down the TES data by rank, and by examining the data with greater fidelity, it can be seen that the experienced ranks are far lower than what the average TES suggests.

For context, a sailor would typically be joining the CAF as a sailor 3<sup>rd</sup> class (S3) in what would be considered an apprenticeship role. After approximately 4 years, they could achieve the rank of sailor 1<sup>st</sup> class (S1). The S1 rank and the qualification gained through the completion of a 12-14 month long technical course is what then grants them the title of a technician, which can be roughly compared to a civilian journeyman.

A quick breakdown of ranks and the minimum amount of time required to achieve that rank is provided below. It needs to be emphasized that these timelines are minimums and on average, it takes far longer to FG the skills and experience needed for the next rank. This context is important in showing that not all qualifications and ranks are as easy to replace, and, in that sense, a single TES number can be misleading. Depending on the missing qualification, that person may take anywhere between 2 years to 20 years to FG.

*Table 1 - Time Needed to Achieve each Rank<sup>14</sup>*

<b>Rank in full</b>	<b>Rank abbreviation</b>	<b>Minimum time since enrollment (years)</b>
Sailor 3 <sup>rd</sup> Class	S3	Upon enrollment
Sailor 2 <sup>nd</sup> Class	S2	2.5
Sailor 1 <sup>st</sup> Class	S1	4
Master Sailor	MS	6
Petty Officer 2 <sup>nd</sup> Class	PO2	8
Petty Officer 1 <sup>st</sup> Class	PO1	11
Chief Petty Officer 2 <sup>nd</sup> Class	CPO2	14

The below graph shows each Mar Tech rank band, with the RCN TES average provided as a baseline. What it shows is that even the currently low TES of 74% for the Mar Tech occupation masks the severity of the situation. The higher numbers of the more junior S3 to S1 ranks skew the PO2 to CPO2 numbers, which are under 60% TES.

The MS to CPO2 band represents the experienced Mar Techs that require a long lead time to train and are vital to the FG of untrained Mar Techs via an apprenticeship style of learning. For this vital group, they are 15% to 25% below the RCN average. This trend can also be identified in most other occupations. The RCN has an issue with retaining experienced sailors, but retention impacts are most severe in technical occupations.

### RCN vs Mar Tech TES (2020 to 2024)

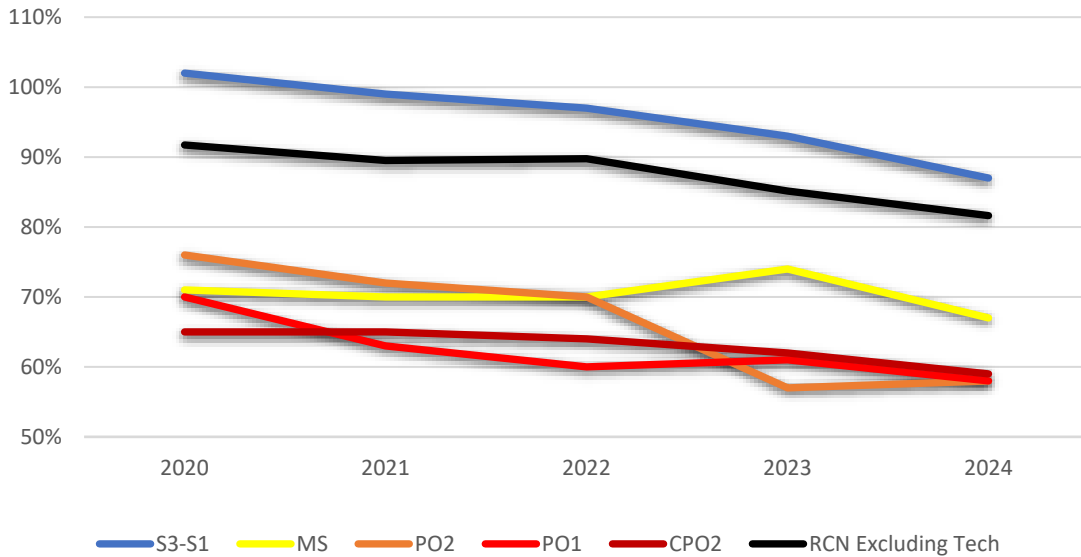


Figure 5 - RCN TES vs Mar Tech TES by Rank<sup>15</sup>

TES forecasting is difficult as it is affected by multiple factors such as releases, transfers, training failures, and promotions. The CAF attempts to account for those factors when it sets a strategic intake plan (SIP), which is the recruiting target required for the year to increase the current TES to the required TEE over a certain period. The next section will examine how CAF recruiting and retention issues currently preclude recovery in the TES.

Below are the SIP recruiting targets from 2020 to 2024. There are a few outliers highlighted in red where the SIP target is set drastically lower than the years preceding or following it. Excluding those outliers, the RCN requires approximately 220-240 Mar Techs and 120-140 W Eng Techs annually to recover.

Table 2 - RCN and Tech Recruiting Targets<sup>16</sup>

	RCN	Mar Tech	W Eng
2020	821	270	126
2021	646	106	115
2022	959	236	172
2023	822	225	70
2024	777	215	118

The SIP has not been met for any of the last 5 years and below is the actual SIP achieved. It should be noted that for FY23/24 a new program was launched called the Naval Experience Program (NEP), where recruits can join the RCN for a trial year as a “sailor” and select an occupation after their trial. This last year 176 members were recruited as sailors under the NEP. This program has

been largely successful and should continue. To keep the data consistent, sailors were not included in either the SIP or the recruiting results. This means the percentages are comparable across all five years but explains the dip in SIP for 2024.

Table 3 - RCN and Tech Recruiting Results<sup>17</sup>

	RCN	Mar Tech	W Eng
2020	526	149	69
2021	377	95	41
2022	634	161	71
2023	398	80	61
2024	346	54	53

The SIP target can be compared against the SIP achieved to arrive at a percentage. As can be seen, if the two outliers are removed (where the SIP target was much lower than average) then recruiting into the technical occupations has been below the RCN non-tech average. The SIP was not met for any occupation in 2024 so although the RCN has a recruiting problem in general, it is even more pronounced for the technical occupations.

Table 4 - RCN and Tech Recruiting Percentages<sup>18</sup>

	RCN Excl Tech	Mar Tech	W Eng
2020	72%	45%	45%
2021	57%	90%	36%
2022	73%	68%	41%
2023	49%	36%	87%
2024	54%	25%	45%

## The Root Causes - Pay and Compensation.

People are complex and recruiting and retention is a challenging space. As shown through exit interviews and town halls, every sailor has unique concerns. However, there are some key areas in pay and compensation, as well as leadership and work environment, in which the RCN falls short. These are factors listed by almost all employees across all industries as being important to job satisfaction.

Drawing from leading scholarly research and reports across economic, demographic, and technological disciplines, this paper highlights important structural and social root causes for personnel shortages within technical occupations in the RCN. These root causes are often difficult to address, and not wholly within the RCN’s influence. The organization has, in the recent past, shown bias toward “quick wins” that are within its immediate control. This includes amalgamating occupations to mask shortages within specialties, increasing force generation by implementing

one-time initiatives, shifting positions between occupations, and waiving qualifications temporarily.<sup>19</sup> Although these quick wins can alleviate workforce problems temporarily, they are not sustainable and rarely address underlying causes. More than five years into this personnel crisis, the easily identified “quick wins” listed above have been implemented, and the organization will now need to address the root causes to ensure a more permanent solution.

Pay is one of those critical questions of sustainable recruitment. Even though a direct comparison to civilian pay is being conducted here, just matching equivalent pay is not enough to account for personal preferences, which is why allied militaries often apply an “X” factor. One study commissioned by the USN describes an “X” factor in the following way: “A service member will remain in the military if the difference between the future streams of military and civilian pay is sufficient to offset the service member’s taste for civilian life (or distaste for military life).”<sup>20</sup>

Statistics Canada (StatsCan) has data charts based on the 2016 and 2021 census. Some of the data points collected during the 2016 census were not available for 2021 so a mixture of both timeframes is used.<sup>21</sup> It should be noted that when it comes to income data, StatsCan includes all data points for which any employment income is collected. This means it would include part-time work, contract work, or seasonal work. So, it is not a useful tool for doing direct comparisons to full-time CAF members, but it can still be used to illustrate macro trends.

The last STEM-specific survey was done in 2016 and the table below is a comparison of STEM vs non-STEM employment income, including certificates, diplomas, and undergraduate degrees. It shows that on average, STEM workers earn about 20% more than non-STEM workers. It should be noted that non-STEM occupations have a high level of income variation as they include social sciences from law to the humanities.

*Table 5 - STEM vs Non-STEM Income<sup>22</sup>*

	Median employment income (\$)	Average employment income (\$)
STEM	72,742	85,315
Engineering and engineering technology	76,801	90,935
Engineering	84,103	101,281
Engineering technology	69,190	78,233
Mathematics and computer and information science	69,954	79,590
BHASE (non-STEM)	56,769	69,328
No postsecondary certificate or degree	42,207	49,776

The 2021 consensus did not include a STEM survey, but it does break down income by fields. The fields selected were categories that most closely resemble the civilian equivalent of a Mar Tech or W Eng Tech. When compared to the average income for “all major fields of study” the “technician”

occupations again earned 20% to 60% more. The CAF does pay both Mar Techs and W Eng Techs the “Specialist 1” pay group once they are technician-qualified, but that is less than 10% above the base pay.

Table 6 - Average vs Technician Income<sup>23</sup>

	Median employment income (\$)	Average employment income (\$)
Computer and information sciences	60,000	70,100
Engineering	67,500	82,400
Technologist/ technicians	58,400	66,500
Mechanic and repair technicians	54,000	58,650
All major fields of study	37,200	50,280
No postsecondary certificate or degree	22,200	33,040

**Comparison Methodology**

To compare wages and benefits, the CAF pay scale will have to be analyzed and equivalencies to civilian qualifications set. For the Mar Tech occupation, the direct comparison to the mechanical side would be the qualifications within the marine industry. In Canada, marine qualifications are set out in the Marine Personnel Regulations (MPR) with Transport Canada (TC) as the licensing body.<sup>24</sup> The marine industry uses a system of 4<sup>th</sup> class, 3<sup>rd</sup> class, 2<sup>nd</sup> class and 1<sup>st</sup> class designations for marine engineers.

On the electrical side of the Mar Tech occupation, the direct comparison would be to an industrial electrician. Within Canada, the Red Seal program sets a common interprovincial standard across tradespeople.<sup>25</sup> A member who is working towards their red seal is typically referred to as an apprentice and after successfully challenging the red seal examination would be considered a journeyman. The trade activities, skills, and knowledge expected of a Red Seal are listed in each occupational standard, which is published by the Red Seal program.<sup>26</sup>

The CAF uses a pay scale based on rank. To achieve the next rank there are minimum time requirements set by Canadian Forces Administrative Orders 49-4 Career Policy Non-Commissioned Members Regular Force, as well as by qualification requirements set by the occupation specifications of each individual occupation.<sup>27</sup> Within each rank, there are often pay increments which increases the base pay for each additional year served at the same rank level.

The below table attempts to align the pay of a typical CAF member against what qualifications and experience they would likely have in industry. This factors in the expected roles they would have within the RCN as compared to equivalent responsibilities within industry. This is done by comparing the RCN occupational standard against the Marine Personnel Regulation standard and the Red Seal occupational standard. It should be noted that the standards chosen are nationally regulated so qualified members would be equally employable anywhere in Canada.

Military members do not currently receive civilian qualifications in the military, but the expected roles, responsibilities, and training are similar enough that a person who could do the job in the military would be able to do the equivalent job in industry. Talent competition is a recruiting challenge and so the CAF and industry are drawing from the same pool.

*Table 7 - Civilian Equivalent Jobs to Mar Tech<sup>28</sup>*

Rank	Time in Service	Marine Industry Equivalent	Red Seal Equivalent
S3	1	engine room rating	Apprentice
S1	5	4 <sup>th</sup> class engineer	Red Seal (Journey person)
PO2	8	3 <sup>rd</sup> class engineer	Master
CPO2	14	2 <sup>nd</sup> class engineer	
CPO1	25	1 <sup>st</sup> class engineer	

When specific points in a career are chosen, there is a level of subjectivity and an argument could be made that specific data points are being selected to bias the narrative and only highlight particular times in a career where CAF members are underpaid relative to industry, without considering an entire career. In this paper, the points of comparison are spread out over a 25-year career and across a spectrum of qualifications that a member whether in the CAF or industry would likely obtain throughout their career. This is in an attempt to establish tradelines and average out potential earnings throughout a career.

The one-year mark is chosen as that is approximately when a member will achieve their occupational function point and can be compared to entry-level jobs in industry. The five-year mark is chosen as that is around the time a technician will have completed the bulk of their academic courseware, comparable to graduating from a similar program at a technical institute. The PO2 rank level is chosen as that is when a Mar Tech on the mechanical side will be an engineer of the watch (EoW), which is equivalent to an industry 3<sup>rd</sup> class marine engineer. Similarly, the CPO2 rank is the closest comparison to a 2<sup>nd</sup> class marine engineer. Finally, the 25-year mark is chosen to demonstrate what the pay for a Mar Tech would be when that member is eligible for an immediate pension.

*Table 8 – RCN Monthly and Yearly Compensation<sup>29</sup>*

Rank	Specific Pay Level Used	Monthly Pay	Yearly Pay
S3	PI 2	4,413	52,956
S1	Specialist 1 / PI 1	6,793	81,516
PO2	Specialist 1 / Base Pay	7,677	92,124
CPO2	Specialist 1 / Base Pay	8,984	107,808
CPO1	Specialist 1 / PI4	9,735	116,820

One of the difficulties in comparing annual salaries is in estimating the pay/hr. CAF members do not collect overtime while industry does. It is challenging to represent every possible scenario,



however a range of pay/hour is provided. An upper limit of pay/hour was found based on a standard 40-hour work week. The lower limit is based on a 126-hour work week assuming an 18-hour workday. An 18-hour workday would likely only apply to personnel at sea, so to represent more fairly the at-sea scenario, sea duty allowance<sup>30</sup> will be added to the CAF base pay when calculating the lower limit. The CAF Leave Manual also grants members three days per month of special leave for every month worked.<sup>31</sup> An assumption was made that at least one of the weekends within that month would be time off and so a work-month was considered to be 25 working days within this scenario.

*Table 9 - RCN Hourly Compensation based on 40hr Work Week (High-End \$/hr)<sup>32</sup>*

Rank	Monthly Pay	Hours per month (22 days at 8 hr/day)	Hourly Pay
S3	4,413	176	25.07
S1	6,793	176	38.60
PO2	7,677	176	43.62
CPO2	8,984	176	51.05
CPO1	9,735	176	55.31

By dividing the monthly pay by the expected hours worked per month an hourly rate is found. Table 9 is based on an 8-hour day with 22 workdays a month. This is the standard number of work hours for military members when not on operations. This shows what the upper limit of pay/hr would be as a member who works the minimal expected hours, mathematically, receives the maximum pay/hr.

*Table 10 - RCN Hourly Compensation based on an 18-hour day at Sea (Low-End \$/hr)<sup>33</sup>*

Rank	Monthly Pay	Sea Duty Allowance	Hours per month (25 days at 18 hr/day)	Hourly Pay
S3	4,413	327	450	10.53
S1	6,793	327	450	15.82
PO2	7,677	465	450	18.09
CPO2	8,984	600	450	21.30
CPO1	9,735	775	450	23.36

This table shows what the lower limit of pay/hour would be. As previously discussed, this analysis is based on an at-sea scenario, calculated at 18-hour days for 25 days a month resulting in 450 hours a month. It could be argued that since the member is away from home, regardless of what they are doing, they should be compensated and so the hours could be calculated at 24 hours a day for 30 days of the month or 720 hours per month. This paper has chosen to take a more conservative method but if the “time away from home” method had been used then the hourly pay in Table 10 would drop by an additional 40%.

## Comparison to the Canadian Coast Guard

One of the closest comparisons that can be made to the RCN is the Canadian Coast Guard (CCG).<sup>34</sup> As another federal institution, the benefits and job stability factors would be very comparable so a direct pay comparison is reasonable. The below table shows CCG compensation. The public service classification taken are the equivalent qualifications presented in Table 7. It should be noted that the latest MAO pay tables are from 2018, however, it has been announced the CCG will be receiving a 2.8% pay raise in 2018, a 2.2% pay raise in 2019, a 1.5% pay raise in 2020, a 1.5% pay raise in 2021, a 4.75% pay raise in 2022, and a 3% pay raise in 2023.<sup>35</sup> This equates to a cumulative raise of 16.8% to bring the 2018 published MAO pay rates to the anticipated 2024 rates.

*Table 11 – 2018 Canadian Cost Guard Compensation*

Year	Public Classification	Service	Yearly Pay	Monthly Pay	Hourly Pay
5	SO-MAO-3		81,966	6,830	36.99
8	SO-MAO-4		86,642	7,220	39.10
14	SO MAO-7		99,827	8,318	45.05
25	SO-MAO-11		135,702	11,309	64.24

*Table 12 – Anticipated Canadian Cost Guard Compensation*

Year	Public Classification	Service	Yearly Pay	Monthly Pay	Hourly Pay
5	SO-MAO-3		95,736	7,978	43.12
8	SO-MAO-4		101,198	8,433	45.58
14	SO MAO-7		116,598	9,717	52.52
25	SO-MAO-11		158,500	13,208	71.40

The CCG does get compensation for time at sea and the hourly rate is based on 28 days on and 28 days off, which averages out to approximately 185 hrs per month. This is very similar to the 176 hrs per month calculation for an RCN member doing a 40-hour week alongside. For the CCG, any additional time worked is paid at the hourly rate. So, whereas an RCN member would effectively make a lower hourly wage the longer they spend at sea a CCG member would make overtime at their hourly rate and be compensated for their additional time worked.

To illustrate this, if a CCG member were asked to sail 450 hours in a month (265 hours more than their base expectation), the monthly pay for a SO-MAO-4 (PO2 equivalent) would be in the region of \$17,500. To clarify, this is not a likely or even possible scenario for a CCG member but is simply used to illustrate what RCN sailors could make if they were compensated for overtime at an industry standard. In addition, the CCG member would have a higher degree of control as to what overtime hours they wish to work for compensation, whereas a CAF member could be ordered to sail even if the CAF member values time over compensation.

Comparison to BC Ferries

**Case Study #1**

**Testimonial provided by retired RCN member working at BC Ferries**

This member left the RCN as a Leading Seaman in 2014 having done most of their career on a Kingston-class vessel. The member was recruited by BC Ferries and worked to obtain their Transport Canada accreditations. The first qualification needed was the Engine Room Rating for which the member took courses at British Columbia Institute of Technology (BCIT). The courses and exams were paid for by BC Ferries while time was paid at 50% wages. The member obtained this qualification in 2016, two years after leaving the forces.

A similar pattern resulted in their 4<sup>th</sup> class qualification in 2017, 3<sup>rd</sup> class in 2019 and 2<sup>nd</sup> class in 2022. For their 4<sup>th</sup> class qualification, education time was paid at 75% wages and for 3<sup>rd</sup> and 2<sup>nd</sup> class, it was fully sponsored. Work rotation starting as a 4<sup>th</sup> class was 14 days on, 14 days off with 12 hr shifts per day. Wages steadily increased from \$96,000 as a 4<sup>th</sup> class to \$112,000 as a 3<sup>rd</sup> class to \$120,000 as a 2<sup>nd</sup> class.

Had the member stayed in the Forces would likely have reached the rank of PO1 but that still would have meant a lower annual salary (much lower if calculated per hour), being on call 24/7, having the instability of military postings, and the additional duties required of military members. This member could make more in compensation were they to take on a few extra shifts but chooses not to, as they value their time over monetary compensation. If they worked 183 days instead of 140 days a year, they would make closer to \$180,000. In this particular case-study, the former RCN member was happy with their career choice and would not consider rejoining the Forces.

The direct comparison of the compensation and benefits between the RCN and BC Ferries as illustrated by Case Study #1 is provided in a tabular format below:

*Table 13 - RCN vs BC Ferries Compensation<sup>36</sup>*

	Navy	Engine Room Rating	4 <sup>th</sup> Class	3rd Class	2nd Class
Calendar Year	2014	2016	2017	2019	2022
Annual Salary	\$70,200	\$74,880	\$112,320	\$131,040	\$140,400
Expected Hours of Work	As required	1852 (168 days)	1852 (168 days)	1680 (140 days)	1680 (140 days)
Hourly Rate		34.56	51.84	66.67	71.43

Vacation	24 days	N/A	7 days	23 days	27.7 days
Schedule	On Call	On Call	14 days on/off	14 days on/off	14 days on/off
Hrs. / Day	11-16	12	12	12	12
Overtime	N/A	2x	2x	2x	2x
Education Assistance	Courses and training provided	Exams and courses paid, time paid at 50% Wage	Exams and courses paid, time paid at 75% Wage	Full sponsorship, time off as required	Full sponsorship, time off as required

### Comparison to Red Seal

The mechanical side of the Mar Tech job is closely related to a Red Seal heavy equipment technician at the lower rank levels (S3 to MS) and a power engineer at the upper-rank levels (PO2 to CPO2). On the electrical side, it is closely related to a Red Seal electrician. Data taken from talent.com,<sup>37</sup> Glassdoor.com,<sup>38</sup> and the Government of Canada job bank<sup>39</sup> provides a generalized average of what the trades would make. Within the chart below, the high-end estimate was used to represent an experienced or master tradesperson. Salaries also vary widely by region, as such the Canada-wide average was taken. As an example, the Canadian Apprenticeship Forum reports that the average red seal trade earns \$117,983 in BC but only \$83,565 in the Atlantic provinces. It is outside the scope of this paper to examine regional disparities in-depth, but this could be a factor in explaining the higher shortage of technicians within MARPAC compared to MARLANT.

Table 14 - Red Seal Compensation

	Annual Salary	Hourly Pay
Heavy Equipment Technician Apprentice	\$71,000	\$34
Heavy Equipment Technician Journeymen	\$79,000 to \$85,000	\$38 – 41
Heavy Equipment Technician Master	\$98,000	\$47
Electrician Apprentice	\$65,000	\$31
Electrician Journeymen	\$79,000 to \$85,000	\$38 – 41
Electrician Master	\$100,000	\$48
Power Engineer 4 <sup>th</sup> Class	\$83,000	\$40
Power Engineer 3 <sup>rd</sup> Class	\$107,000	\$51
Power Engineer 2 <sup>nd</sup> Class	\$121,000	\$58
Power Engineer 1 <sup>st</sup> Class	\$150,000	\$72
Network Technician	\$69,000 to \$79,000	\$33 - 38

Putting it all into a graphical format, and using S3, S1, PO2, CPO2 and CPO1 as the points in the x-axis, it becomes clear that the RCN’s salary relative to industry is heavily dependent on the hours worked. If strictly looking at annual compensation, the RCN is towards the low end but still comparable to industry, as indicated in Figure 6.

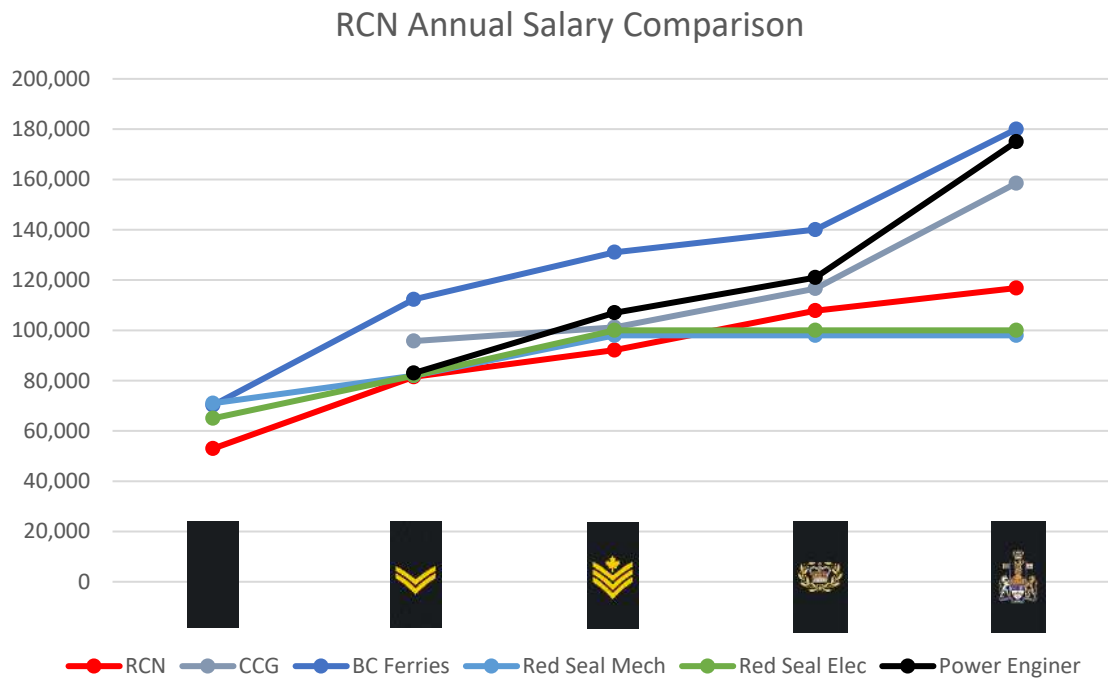


Figure 6 - RCN Annual Compensation Comparison

However, if that were to be broken down into an hourly wage the discrepancy can be far larger. In Figure 7, the RCN upper range is based on an 8-hour day for 22 days a month, which works out to 176 hours a month. The lower band is based on an 18-hour day for 25 days a month, which works out to 450 hours a month.

The RCN does keep statistics on time away from home (TAFH) which can be used to approximate how many sailors are working long hours. The TAFH is not a perfect metric of operational tempo as it does not account for long hours alongside or weekend duties, but it is a decent approximation for sea days. In a rolling 365-day period, over 1,000 RCN sailors had at least some TAFH. Over 500 sailors had more than 50 days TAFH, over 250 sailors had more than 100 days TAFH, and over 50 sailors had more than 180 days TAFH.<sup>40</sup> For all these sailors the effective hourly compensation would fall somewhere between the upper and lower bands as indicated in Figure 7. What this graph does not capture is the potential for RCN sailors to collect hazardous duty allowance or entitlement to periods of tax-free earnings during certain operations. That would increase the relative net pay for sailors but it was not included as it is very situationally dependent and not something a sailor can opt into.

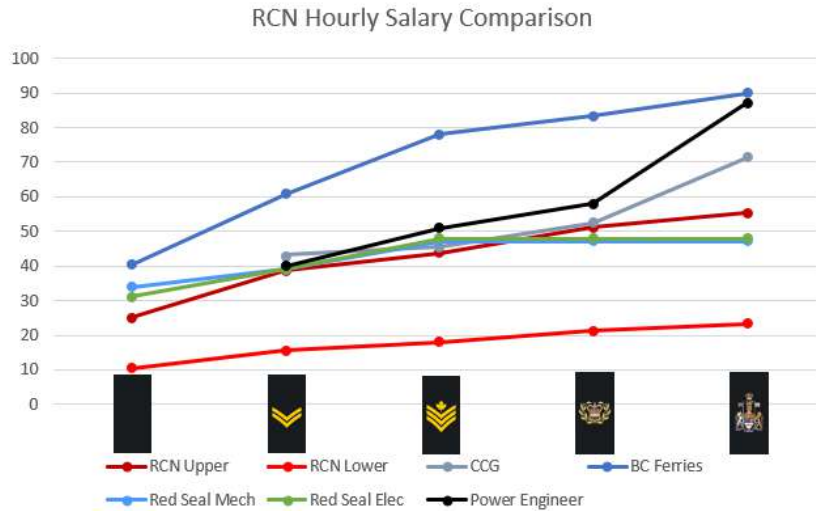


Figure 7 – RCN Hourly Compensation Comparison

Finally, a daily salary comparison between the RCN, CCG and BC ferries is produced below. This is produced by taking the annual rate and dividing by the anticipated number of days worked in a year. For the RCN, that is 210 days based on the Canadian average of 250 days (with statutory holidays) minus the 25 days of annual leave granted to CAF members, minus 15 days of special leave. For the CCG it is

based on 180 days given the 2 weeks on and 2 weeks off work tempo. For BC ferries this is based on the company policy where engine room ratings and 4<sup>th</sup> class engineers work 168 days a year, while 3<sup>rd</sup> class and above are expected to work 140 days a year. What it shows is that the compensatory time off for CAF members is below the industry average and thus equates to a lower daily rate, even if the annual salary is comparable.

**Compensation vs Benefits**

This last section will examine the benefits offered by the CAF, as a way to evaluate the total value proposition. The GoC website “CAF Offer – Our Value Proposition” states “The CAF offer consists of an extensive set of monetary and non-monetary offerings that enable and enhance a member’s journey in the CAF. It has been designed to attract Canadians to the CAF as an employer of choice; and motivate, engage, and support retention of serving members.”<sup>41</sup> The website guide has four main sections:

my career, my compensation, my benefits, and my work/life.

Compensation was discussed earlier in this chapter, work/life will be discussed in the subsequent chapter and so this section will examine career and benefits.

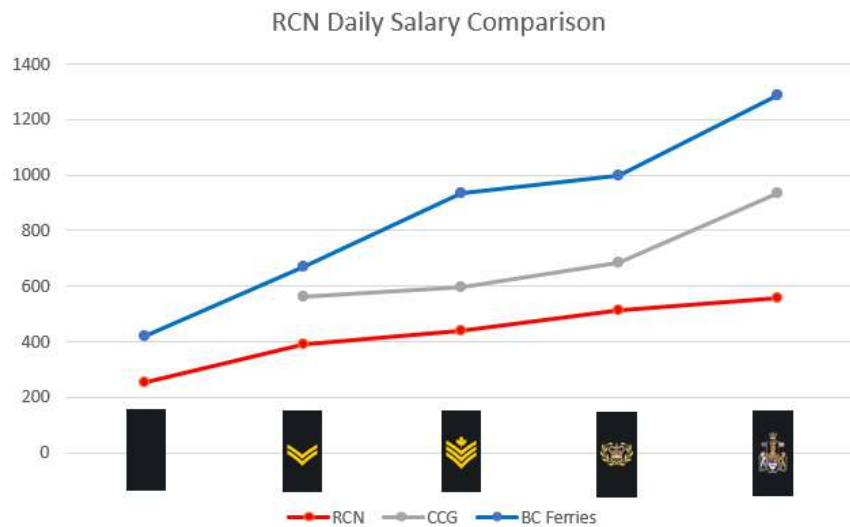


Figure 8 – RCN Daily Salary Comparison

In terms of career, the primary benefit is listed as “learning” which includes military universities and schools, professional development, and basic training. Although job training is provided by the CAF, for the NCM occupations, the training provided is generally not civilian recognized, transferable, or accredited. If the Royal Military College granted officers a CAF certificate instead of an accredited degree as part of the Regular Officer Training Plan (ROTP), the program would likely have a difficult time attracting students or at least competing for applicants interested in attending university. There are some exceptions to NCM training programs such as the NCM Subsidized Training and Education Plan (NCMSTEP), but it is still fairly limited.

If for the majority of NCM entrants, a diploma or apprenticeship is not directly obtained from the training provided, it would be difficult to argue that the training provided should be considered a benefit. It is essential job training that the employer provides to make employees functional at their jobs. The member does benefit from being able to collect a salary while under training but the main benefactor of the training is the institution, not the individual. There are examples of other militaries approaching technical training closer to the ROTP program where diplomas and accreditation are offered. The New Zealand Defence Forces, for example, offers apprenticeship trades that do align with civilian counterparts and Royal New Zealand Navy marine engineers can obtain the equivalent of a Transport Canada certification in marine engineering by progressing through their military career.<sup>42</sup>

Moving to the benefits umbrella, the biggest differentiator when compared to civilian employers is the defined benefits pensions plan offered to CAF members. The CAF offers members an immediate annuity after 25 years of service. The annuity amount is set at (2% x years of pensionable service x salary), where the salary is an average of the highest 5 years of income.<sup>43</sup> So, for a member that retires after 25 years of service, they will receive 50% of their average working salary.

To roughly calculate the “value” of an immediate annuity an example will be used with the following assumptions:

- A member joins at age 20, completes 25 years of pensionable service and retires at age 45;
- They collect their pension for 35 years based on an average life expectancy of 80 years;
- They retire with a base pay of \$8,000 a month or \$96,000 annually which is somewhere between the PO1 and CPO2 rank level. This means the value of the pension is (2% x 25 x \$96,000) or \$48,000 annually;
- A discount rate of 5% is used. (Despite the low-interest rate environment of the last 15 years, data in a 50-100 year horizon shows that 5-7% is indeed a reasonable average);

Based on the above assumptions the simplest calculation would be a perpetual annuity calculation where Net present value of pension (PV) = annuity amount / discount rate.<sup>44</sup> This equates to \$48,000 / 5% which would mean the net present value of a pension that could pay \$48,000 in perpetuity should be valued at \$960,000.

However, a perpetual annuity is not exactly accurate as the member is only collecting for 35 years and the pension is not transferable to future generations. Therefore, an annuity calculation that allows the principal to be drawn down to 0 would be more accurate. The formula for that is  $PV = \text{annuity amount} * [(1 + r)^Y - 1] / [(1 + r)^Y - 1]r$  where Y is number of years the annuity needs to

pay out and  $r$  is the discount rate.<sup>45</sup> Putting in the numbers for this example means a starting sum of \$825,000 would be sufficient to provide an annuity of \$48,000 for 35 years if the amount was fixed.

This does not mean the employer is simply giving a CAF member \$825,000 to \$960,000 of pension benefits as members do contribute to their pensions as well. As per the Superannuation Act, members contribute just under 10% of their salary to their pension fund. So, in this example, \$9,600 a year would be funded by the individual. A \$9,600 a year contribution compounded at 5% for 25 years would result in a future value (FV) of \$458,000. In other words, the employer funds roughly half the value of their immediate annuity so the value of the CAF pension can be equated to a defined contribution plan where the employer matches a member's RRSP contribution. If an employer matched the \$9,600 annual contribution dollar for dollar, then the compounded growth over 25 years would result in a sum sufficient to pay out an annuity of \$48,000 a year for 35 years.

This example makes many assumptions and economic conditions at the time will drastically change the calculus. For example, in a low interest rate environment a defined benefits plan is more advantageous than a defined contribution plan. However, in a high interest rate environment, the opposite is also true and someone who can access the full value of their RRSP may be in a more advantageous position. Someone who outlives life expectancy benefits from a defined benefits plan and vice versa. This example also does not factor in that the CAF pension indexes to CPI once a member's age and years of service add up to 85. In this example, the member would collect \$48,000 fixed for 15 years but would then be eligible for a cost-of-living increase adjustment indexed to CPI. In addition, the member's starting salary would be less than the \$96,000 used throughout this example so the member is contributing less to their pension contributions in the early years of their career.

Various other factors could make the pension more or less "valuable" to each individual and the elimination of uncertainty is an intangible benefit all of its own. Based on these particular assumptions, the pension benefits provided by the CAF can be equated to at least an additional \$9,600 a year in pension matching contributions or could be considered an additional 10% or more in benefits on top of base salary if a member remains in the CAF for 25 years.

The other benefits outside of pension, whether health care or dependent care will tend to favour those who are older in life and who have dependents. For a 17-year-old with no dependents and little ability to manage their own time, many of the potential benefits are negligible, or cannot be realized. There have also been numerous studies that show a correlation between emotional well-being and income up to around the \$75,000 to \$100,000 range.<sup>46</sup> So for those making under the \$75,000 mark, an additional \$1 in equivalent benefit would likely have less useful utility than an additional \$1 in disposable income. A robust dental plan does not help with paying rent, a future education grant does not solve present-day cash flow challenges. This is not to downplay the above-average benefits package available to CAF members but simply to point out that the much-discussed pension plan is just a 10% pay raise under reasonable conditions and that not all benefits can be converted to an equivalent income as it either does not provide the same utility or is inaccessible to certain CAF members.



Although beyond the scope of this paper to prove or disprove, it should be considered that senior decision makers will be older, will be making above \$100,000, are more likely to have dependents and have more ability to manage their own time. All these factors mean they may view benefits far differently than a recruit. In other words, there could exist an unintentional bias when leadership states “Benefits make up for our compensation.”

There does exist a compensation gap between the CAF and industry for a technician whose skill set is in demand. In terms of RCN occupations, this would apply to Mar Techs, W Eng Techs, and Nav Comms whose skillsets can be roughly equivalent to a heavy-duty technician, an industrial electrician, a control technician, or a network technician. Due to the fixed pay structure and relatively fixed leave structure of the CAF, this gap widens the more a member works beyond a standard 40-hour week. For the average sailor, this typically means the more sea time they have, the bigger the pay/hr gap. The above-average benefits package and specialist pay incentive help close that gap but do not eliminate it. Most importantly, it is not enough to simply match the civilian sector. In theory, the military needs to offer an X factor that “offset a member’s taste for civilian life (or distaste for military life).”

## Root Causes: Work Environment and Quality of Life

By nature, quality of life is a subjective term; however, a generalized framework can be used to evaluate an organization to identify factors central to its ability to recruit and retain. The framework used here is Scott’s Sociological Institutional Analysis model, which argues that organizations function across three broad pillars: regulative, normative, and cultural/cognitive.<sup>47</sup> The regulative pillar constitutes the rules, policies, orders, or regulations that dictate what a member “must” do.<sup>48</sup> The normative pillar encompasses work norms or habits and comprises the “key principles or values that are intended to be applied by individuals when exercising judgement in ambiguous or complex situations” and can be considered the things an employee “ought to” do.<sup>49</sup> Finally, the cultural/cognitive pillar is reflected in the internalized worldview of the membership and can be considered the things they collectively “want to” do.<sup>50</sup> In a chart form, Scott’s model can be summarized as:

	<b>Regulative</b>	<b>Normative</b>	<b>Cognitive</b>
<b>Legitimacy</b>	Legal systems	Moral and ethical systems	Cultural systems
<b>Central Rudiments</b>	Policies and rules	Roles, habits, and norms	Values, beliefs, and assumptions
<b>Change Drivers</b>	Legal obligation	Moral obligation	Internalized change values
<b>Change Sustainers</b>	Fear and coercion	Duty and responsibility	Social identity and personal desire
<b>Behavioural Reasoning</b>	Have to	Ought to	Want to

Table 15 - Summary of Scott’s Regulative, Normative and Cognitive Elements (copied from Jennifer Palthe)<sup>51</sup>

This model can be used by comparing whether some particular habits or norms are (more) relevant to a technical workforce that is at odds with the organization or whether there are rules and regulations of a technical nature that only apply to CAF/DND members that are a cause of dissatisfaction.

### **STEM Workers in the Defence Workforce**

Leveraging the studies done by the US Army and US Marine Corps on the retention of STEM workers in the cyber domain, one can identify some basic concerns of a technical workforce. Collins-Hines, when interviewing US Army cyber employers, found that besides monetary incentives, the work itself is the next best motivator.<sup>52</sup> She believes that “individuals in these fields are often enthusiastic about problem-solving, innovation, and making a meaningful impact on technology and society” and, that to reduce turnover, the tasks being assigned need to be challenging and intellectually stimulating.<sup>53</sup> When those job expectations do not align, Ramsey, a Marine Cyber Protection Team leader, warns that retention is a challenge because “expectations as a cyber professional in the Marine Corps do not align with the expectations of the service members.”<sup>54</sup>

Pursuing a technical role in a large non-engineering company can be challenging, and a National Research Council report found that “many STEM assignments in DOD involve a degree of procedure and bureaucracy that high-quality STEM professionals are unlikely to find satisfying.”<sup>55</sup> That same report closes by stating “the STEM issue for the DOD is the quality of its workforce, not the quantity available. The DOD needs a suitable share of the most talented STEM professionals.”<sup>56</sup> Reports in cyber, space, and other technical commands indicate that job expectation mismatch and conflicting cultures are fairly common.

The RCN is not an engineering or technology company but half of its workforce works in STEM. Those seeking to be mariners and warfighters may find they have little exposure to mariners or warfighting tasks. Meanwhile, those seeking to be technicians and troubleshooters will find the majority of their day occupied by non-technical tasks.

The concept of increasing job satisfaction to improve retention is not unique to the technical occupations and factors such as high levels of bureaucracy impact all CAF members. However, the regulative environment in an operational-focused organization may create an extra layer of frustration for technicians where mission success does not always align with maintaining, repairing, or completing a technical task and where technical work is the supporting function. For a self-employed mechanic, the repair task is likely the objective. For a mechanic in the RCN, the repair task is often secondary to the mission and a job well done simply means the technical state no longer hinders the ongoing mission. In other words, the regulative pillar within the CAF is focused on operations and the normative pillar enforces the concept of mission success.

This may be suitable, but it does mean the organizational goal and the individual’s professional goal are more often at odds for a technical worker and their direct contribution to mission success is less visible to both themselves and the organization.

The ideal technician in the RCN is motivated and eager to perform repairs but understands that larger operational objectives often put the priorities elsewhere and accepts the bureaucratic and slow-moving nature of a large government organization. That is a very difficult environment to ask a workforce to exist within, at least at the junior level.

A past strategy has been to tell junior sailors to “do as you’re told” with the understanding that they will eventually learn to appreciate their role as they move up the organization and gain exposure to the decision-making process. Yet, that strategy is increasingly running into resistance as younger generations increasingly want to know the “why.” Critically, they will resist orders that to them do not make sense and demand quicker resolutions to their concerns.

### **Gen Z and Millennials in the Defence Workforce**

Generation Z and Millennials are expected to make up 75% of the global workforce by 2025 so their desires must be considered when designing a sustainable organization.<sup>57</sup> Major Colleen Grebstad believes that

The work habits of Generation Z (and Gen Y – the Millennials – for that matter) have been identified as strikingly different than previous generational cohorts. While baby boomers and Gen X prioritized professional and financial stability and success, newer generations seem to be prioritizing personal and professional freedoms, family, marriage and parenthood above all else.<sup>58</sup>

This last point is collaborated by Morgan Fox in an article on post-millennials and the CAF which asserts that “although family structures are very different from fifty years ago, CAF culture and policies have not evolved sufficiently. Civilian partners now need to be considered more carefully.”<sup>59</sup>

A slightly different approach is to examine the common characteristics and the value/reward preferences of these generations. Nana Acheampong’s research suggests that new workers are looking for a work environment geared towards not just financial rewards, but enhancing job satisfaction, providing professional flexibility, and promoting family stability.”<sup>60</sup>

The roles and habits which define the current Navy workforce may not come as naturally to the younger generations, meaning more effort, thought, and energy needs to be expended on instilling those norms – or adapting them.

### **Work Environment Compared to other RCN Occupations**

One of the challenges of the RCN is balancing the needs of the service against the tempo of its workforce in an environment of shrinking workforce hours. This is especially challenging for the technical workforce due to the material state of the ships and the requirement for maintenance while a ship is alongside. Maintenance in the Navy can be roughly divided into three categories, 1<sup>st</sup> line, 2<sup>nd</sup> line and 3<sup>rd</sup> line maintenance. 1<sup>st</sup> line includes maintenance routines that are performed by ship staff (members of the ship’s company) and are generally capable of being performed at sea

or alongside. 2<sup>nd</sup> line encompasses maintenance routines that require the support of fleet maintenance facilities (FMFs) ashore, which are still internal to DND, either due to the expertise required, the tooling and resources required, or due to regulative requirements. 3<sup>rd</sup> line comprises work performed by contractors, original equipment manufacturers, or routines where equipment is removed for extension repair and overhaul (R&O) offsite.

1<sup>st</sup> line maintenance routines are performed regardless of the ship's program, whether at sea or alongside. 2<sup>nd</sup> line maintenance is scheduled for when the ship is alongside homeport and 3<sup>rd</sup> line is typically programmed years in advance during regularly scheduled docking work periods. The current reality for the legacy platforms (Halifax-class frigates and Victoria-class submarines) is that they require more maintenance hours as they age and time alongside needs to be maximized to keep up with the maintenance workload. This means that ships are frequently, if not always, in a work period while alongside. The current work procedures mean that regardless of whether the maintenance is being performed by FMF or through contracted in-service support contracts (ISSC), ship staff is still required to be present and, at the very least, expected to assist with tasks such as ensuring a safe work environment, tracking the work on behalf of the chain of command, and maintaining overall charge of the worksite.

For the technical workforce, this results in them being heavily tasked whether at sea or alongside. This runs counter to the intent and desire of giving sailors periods of high-tempo work (often during operations) balanced by periods of low-tempo work (ideally alongside). TAFH is often used as a metric to estimate operational tempo but it is a flawed metric as it does not capture when a workforce is being heavily utilized in homeport. It is also often messaged to sailors that time alongside should be time for progressing individual training, refresher training, fitness, and work/life balance. For the technical workforce, the conditions in the fleet do not allow for that balance and this is particularly damaging to job satisfaction while alongside. Furthermore, the RCN has not reduced the overall demand even as the TES of the technical workforce has dropped, resulting in an ever-increasing work tempo for the remaining members. This is not a new problem, but it is being exacerbated by the material state of the platforms and by some recent changes in workplace culture.

### **Work Culture Compared to other RCN Occupations**

The RCN currently messages that all members are “sailors first” meaning the tasks of being a sailor take precedence over individual occupations. This is positive in the sense of building a common identity within the organization, but it also creates an expectation that all sailors should be equal. As stated in the previous section, that is proving to be difficult due to the differing job functions, and there is currently no pan-RCN policy or direction as to how to achieve an inter-departmental balance.

This inter-departmental balance has never been achieved but, in the past, it was partially mitigated via culture and messaging. The following paragraphs specifically detail the cultural shift accompanying the stand-up of Marine Technicians in 2017 but the themes also apply to other technicians. In 2017, three separate occupations (Marine Engineers, Electrical Technicians, and Hull Technicians) were amalgamated into a marine technician. As part of that occupation change, there was a deliberate effort to change the occupational culture.

Marine Engineers, whether justified or not, previously felt they were “special.” This was reflected in the language, in the policy, and to a certain extent in the treatment of engineers. For example, technicians held “certifications” without which ships could not sail, key engineering positions were referred to as “engineering officer of the watch (EOOW)” even if they were not technically officers; and the chief engineer was called a “chief engine room artificer (CERA)” adding to the perception that an engineering CPO2 was unique. All these intangibles (amongst many more examples) created a culture where engineers internalized the extra hours and requirements as just part of their job. With these distinctions, engineers may have worked hard and been content with their differences because their positions were recognized as culturally significant.

This engineering culture was intentionally eliminated in 2017 during occupational restructuring. MarTechs were told they were operators, not technicians, the CERA title became a generic “departmental coordinator”, EOOW became an engineering watchkeeper, and engineers were shaped to be sailors first, amongst many other changes.<sup>61</sup> This paper does not attempt to assess whether this policy is correct or incorrect, however, a legacy culture was intentionally eliminated without anything to replace it with. As a result, technicians want to be treated as any other sailor and are less tolerant of any perceived inequality or workload differences. Intolerance of inequity may also relate to generational changes with Generation Z placing a higher emphasis on equality.<sup>62</sup> This puts the onus back on the RCN to balance inter-departmental workload to ensure factors such as work/life balance, family stability, and professional flexibility are achievable for a technician alongside (or at least eliminate perceived inequality).

## **Case Study #2**

### **Testimonial provided by retired RCN member working at Johnson Controls**

This member joined the RCN as a marine engineer in 2011 under the subsidized education plan, completing a marine technician diploma at the Marine Institute in St. John’s in 2013. They served with distinction both within the fleet and the naval training system. The member retired in 2022 at the rank of MS.

The primary factor in the member leaving the CAF was to be able to provide a stable environment for their family. Holding both a diploma and a background in control systems, their skillset and experience was in high demand and the job search was relatively easy. The pay is comparable at Johnson Controls although the benefits are not as robust. According to this retired member, the trade-off for stability and the ability to be home every night was well worth the slight difference in benefits.

This member was very satisfied with their decision to retire and without changes in work/life stability would not reconsider rejoining the CAF.

### Case Study #3

#### Testimonial provided by retired RCN member working at the Canadian Coast Guard

This member joined the RCN as a marine electrician in 2011 and after several years of distinguished service, specialized as a control technician. The member released from the forces in 2022 at the rank of MS.

The primary factor in the member leaving the CAF was to have more control over career choices (when to go on courses), as well as having the ability to forecast a work schedule for family planning purposes. The member felt they were consistently being attached posted to units to fill operational shortages at a detriment to both their career and family.

The member is now employed within the Department of Fisheries and Oceans as a Coast Guard member. They make more than they did in the RCN (given the recent 2024 CCG pay adjustment), have more flexibility, get compensated for overtime and difficult tasks, and find the work/life balance better. The benefits are similar as the CCG is a federal government organization.

The member stated the decision to retire from the CAF was not an easy one, but would not reconsider joining the RCN unless there was purpose or they could not find employment elsewhere.

These case studies both involve high-performing individuals who left before completing 25 years of service (a milestone that is often an incentive to stay as it allows for an immediate pension) for better stability. The desire for stability is certainly not unique to the technical occupations but the skillsets possessed by technical members allow them to conduct a lateral transfer into industry more easily. It also allows them to directly compare their current job to equivalent industry jobs, which may offset some of the fear of the unknown.

There is a growing gap between the requirements of military service and the trending expectations of the workforce. Requirements for flexibility, remote work, and flattening hierarchy are just a few examples. Some of these factors are amplified for the technical workforce as there already exists a friction point between the regulations and norms that serve an operational and warfighting function, versus an environment that supports engineering work in a peacetime context. The RCN will either need to close this gap, accept that it will appeal to a smaller group of candidates, or increase the X factor in pay and compensation to incentivize its workforce to forgo some of their expectations. The unique operating conditions within the CAF also mean that as an employer the CAF must be able to self-generate their workforce through their own training system, and cannot directly hire senior technical leaders directly. Simply being “competitive” with industry in pay may no longer be enough given the work environment expected of a military member.

## Root Causes – Leadership and Purpose

The CAF and RCN, like other militaries, is a hierarchical and pyramidal organization. The current force structure is meant to support a fighting force, which is the *raison d'être* for a military. This force structure is not well suited for collaborative work, tackling technical challenges, and conducting sustainment functions such as routine maintenance. This paper does not argue that the hierarchical organization needs to be abolished but rather draws attention to the challenge of adapting this structure during times of peacetime when sustainment is the focus.

A full analysis of the suitability of the current military force structure would need to consider demographics, technological changes, societal changes, and several other factors. This is beyond the scope of this paper. This section will instead focus on specifically the leadership and cultural desires of a technical workforce using existing research into civilian technology and engineering-focused companies. It will also examine the differences caused by generational changes, specifically Generation Z and to a lesser extent, Millennials.

### Leadership for a STEM Workforce

Deborah Doel-Hammond in her correlation study on the STEM workforce views of outstanding leadership notes that employees most value leaders who are trustworthy, communicate clearly, are sincere, inspirational, and diplomatic.<sup>63</sup> They are looking for leaders that collaborate, listen, and inspire. Military leaders are often trained and taught to be decisive, to dictate, and to direct. This creates a friction point between what a STEM workforce desires and what the organization values in a leader.

Within the technical occupations, there are some unique leadership and followership dynamics. In general, it is the NCMs that possess the tradesperson skills, hold the experience, and do the hands-on work. The technical officers may be highly educated and typically have engineering degrees, but their function is more of a manager. Neither the engineering officer corps nor the command teams have the technical experience needed to be able to direct the specifics of a repair or a routine. Therefore, there needs to be collaboration and clear communication between the workforce and management.

The technical workforce often relies upon deep collaboration to solve technical challenges. This is not “esprit de corps” or teamwork, but rather the need to share technical knowledge across multiple domains to solve complex problems.<sup>64</sup> Equipment on board ships is becoming increasingly complex and even basic machinery requires mechanical, electrical, network and control expertise. A single person cannot be a SME in all disciplines; knowledge needs to be freely shared and troubleshooting must be done in teams. As Duncan Watts found in his research “simple tasks are best accomplished by individuals, while difficult ones are more efficiently completed by a group.”<sup>65</sup> An analogy in home construction would be that no single handyman could do the job of a plumber, an electrician, a carpenter, a roofer, a drywaller, and a painter, with the same level of skill that individual experts in those fields would provide. It might be cheaper and simpler to hire one general contractor, but the level of complexity and specialization needed precludes that as an option.

The officer corps is taught engineering theories and principles, but diagnosing, troubleshooting, repairing, testing, and trialling equipment is not part of their expected tasks. Officers also have limited hand-skills training, which means without proper input, decisions may be based on inaccurate estimates of the complexity and challenges of a task. The officer corps and the Command team have the authority to make decisions on repair methods, on the time allocated to repairs, and can dictate the course of action to take. Therefore, it is logical a technical workforce wants a leader who is collaborative and willing to listen.

This is not to suggest that leadership is not required within the technical domain. Evidence suggests that technology companies tend to experience more challenges in developing leaders. In a study of over 25,000 leaders, technology organizations reported only a 61% success rate for filling leadership positions internally, which was 20% lower than in other industries.<sup>66</sup> It is theorized that the background and development of an engineer, scientist, and technician, produces data-driven and analytical thinkers, who are detail-focused and as a result, lose sight of the bigger picture.<sup>67</sup> Therefore leadership within a technical workforce is critical to unifying individual effort within an organizational goal, the leader just needs to be able to adjust their leadership style and have an understanding of the leadership-fellowship dynamic within a technical organization.

### **Leadership for a Gen Z and Millennial Workforce**

Jeffrey Williford, in one particular Generation Z study, found that “care, empathy, and trust were the most desirable characteristics” in a leader.<sup>68</sup> Deon Evans in a correlation study between leadership styles and motivation among US Army reserve soldiers, found a high correlation between transformational and ethical leadership.<sup>69</sup> These findings are supported by a similar study for the US Marine Corps where Collin Barry found a positive relationship between authentic leadership and job satisfaction.<sup>70</sup>

The desires of Generation Z align closely with Doel-Hammond’s findings on the desires of STEM workers.<sup>71</sup> Generation Z now comprises of over 30% of the workforce, a percentage that will only increase as more baby boomers retire from the workforce.<sup>72</sup> As such, it is beneficial for the RCN to adapt its leadership style, at least partially, to the desires of the workforce as opposed to onboarding new members into accepting the current leadership style.



#### Case Study #4

Testimonial provided by retired RCN member working at BMT

This member left the RCN in 2023 after a full career. The member was relatively young and had always intended to continue working within the field. The primary reason for no longer wanting to stay in the military was lack of job satisfaction. The member felt they no longer contributed anything of value to either the Navy or to their occupation.

Once the member no longer felt there was a sense of purpose in wearing the uniform, it made limited financial sense to stay past the point of an immediate annuity. The retired member now makes more than they did in the military, has similar leave benefits, comparable medical and dental benefits, improved geographical stability, and has far more flexibility with the option to work up to 80% of the work week from home.

The section the member works in is largely comprised of former military members and so the transition was seamless. As with many defence contractors that are heavily staffed by retired members, it can offer the same culture as the CAF, without having to be in the CAF. The member is happy with their decision to leave and may consider reserve service in the future but would not return to the regular force.

#### Purpose

When CAF members bring up concerns regarding compensation a common rebuttal is that one should not have joined the CAF for money and that members should feel a higher purpose in putting on a uniform. Trusted to Serve makes this clear: “as military professionals, we place service before self to maximize team effectiveness. This commitment to a higher purpose rests at the core of our value system.”<sup>73</sup> However, it has been more challenging to articulate what that “purpose” is. In the absence of a clearly articulated National Security Strategy, and a government that is still unsure of what its defence priorities are, CAF members cannot be blamed for not being able to internalize that purpose.

A job is something one does to earn money to obtain material benefits outside of work. A career is a series of similar jobs which may be fulfilling but are also about promotions and advancement. A “calling” is something people believe they were meant to do, typically regarded as socially valuable, and often accompanied by intrinsic motivation.<sup>74</sup> There are organizational benefits if employees find their “calling” within the institution as that will increase retention, motivation, and dedication. The challenge is in cultivating a sense of purpose in the workforce.

Articulating that purpose may be more of a challenge for those whose jobs have a corresponding civilian counterpart or for those who are further removed from the “warfighting” side of uniformed service. This is not to say technicians are any less vital to a fighting Navy, just that it may be more difficult to express how a technical role is unique to the profession of arms. There are limited organizations where one can be an infanteer if that is your calling, but there are many organizations where one can be an electrician and still contribute to Canadian society.

Another challenge in motivating technicians lies in the cultural or cognitive pillar of Scott's model, and the social hierarchies that exist between operators and supporters. Vanessa Brown in her thesis interviewed both faculty and students at the Canadian Forces College (CFC) and found "a common premise across participant groups is the observation of a hierarchical operator/supporter paradigm which creates a potent us versus them division within the learning environment. This social hierarchy is seen as privileging the knowledge and opinions of members in operational occupations, creating inequality in the classroom."<sup>75</sup> Technical occupations in the RCN serve predominantly in supporter roles and so this social hierarchy could contribute to technicians feeling they have less control over the direction of the organization, and as a corollary, feel they have less ownership in the organization. As well, honours and awards strongly favour service in an operational context, while marginalizing high performance in key supporting roles ashore.

Clearly, there exists a gap between the leadership style, work environment, and organizational culture required during a conflict and that which is optimized for sustainment activities in a peacetime environment. This is not meant to criticize or suggest the military should shift away from a warfighting mentality, but to illustrate the challenges of preparing a navy that is not at war, for war. A challenge that is amplified by successive generations that have only known peace and with technicians that are further removed from the operational side.

## **Solution Space: A General Framework**

### **Pay and Compensation**

As has been discussed, civilian industry offers compensation and workplace flexibility advantages in comparison with the RCN. As such, there needs to be a mechanism to better compensate members (whether pay or time in lieu) for additional hours worked and time away from home. RCN pay is relatively competitive on an annual basis but not on an hourly basis (if working more than 40 hours week). Sea pay, deployment incentives, and the limited amount of pre/post-deployment leave do not compensate sailors adequately for the time spent away from their families. Given the emphasis on stability, family and work/life balance, the workforce is less willing to accept "working for free."

A system needs to be put in place where members are compensated on the merits of skill, not just the job. The current pay system based on a hierarchical rank system has a promotion system that is not always linked to competencies or performance.<sup>76</sup> Highly skilled individuals are required at all rank levels and not all skilled jobs require seniority or additional time in rank. In fact, as members move up the pay scale they typically do less technical work and instead move into management roles, where their hand skills are not being utilized. The UK Ministry of Defence (MoD), facing similar personnel challenges commissioned an independent review which in 2023 recommended "skill-based pay element be incorporated into the armed forces pay model."<sup>77</sup>

The CAF needs a financial retention incentive that is reactive and can be targeted towards specific occupations and rank levels as required. There is often a counterargument made that retention is not the problem, but rather recruiting. This is demonstrably true, the FY 22/23 RCN attrition rate was 8.8%, which is comparable to the 10-year historical average of 7.4%.<sup>78</sup> Recruiting for the

2023/24 fiscal year only achieved 67% of the targeted SIP (47% if NEP candidates are not included) and has underperformed for years.<sup>79</sup> What this argument is missing is the importance of “word of mouth” and the link between workplace satisfaction and recruiting. David Persaud, in his paper on recruiting Generation Z for the US Army, found that the majority of enlistees were more influenced by what was said and written by currently serving members on Reddit or Instagram than they were by official websites such as Goarmy.com.<sup>80</sup> The CAF also relies upon currently serving members to recruit and unfortunately, the sentiment from currently serving members as portrayed on social media is mostly negative. Unless the recruiting model is completely changed, workplace satisfaction needs to be thought of as a precursor to solving extant recruiting challenges.

### **Work Environment and Quality of Life**

The RCN should have a conversation about whether to place primacy on maintaining an operational-focused culture. If the answer is yes, then the RCN will need to accept that there is an efficiency price to be paid when it comes to sustainment activities. There will also need to be a more conscious effort to motivate and link those not directly involved in operations to unit goals. Alternatively, the RCN could investigate regulative and normative models of institutional functioning to maximize sustainment efficiency, and adjust the work environment depending on the required task.

In relation to shifting generational expectations, the CAF would benefit from determining how to tackle the growing gap between what the younger workforce wants and what is required by military service. Trends, such as the desire for remote work, less formality, flatter hierarchy, a focus on mental health and work/life balance, are likely here to stay. The CAF can adapt to some of these desires and integrate flexible policies (where possible), increase the military “X” factor to compensate for the growing gap (where not possible), or it can accept that the organization will appeal to a more selective group of younger recruits.

In terms of the current technical workforce, the RCN requires a strategy to balance the workload amongst its occupations and outsource residual work to contractors. Given the age of the fleet and shortages faced both within the RCN and the FMFs, it is likely that the demand for alongside work will remain high. If rebalancing is not possible then the RCN needs to consider rebuilding the culture and narrative that certain qualifications are indeed “exceptional” and as a result, in high demand, through both cultural and financial incentives for those receiving qualifications. It is not sustainable to push the narrative that all sailors are equal but not be able to create conditions of equality.

### **Leadership and Purpose**

The RCN should consider shifting to and adopting a servant style of leadership which is characterized by its focus on providing developmental opportunities for its workforce. Compared to other leadership styles, servant leadership is more focused on the individual, with the understanding that individuals who have bought into the institutional vision are ultimately good for the company<sup>81</sup> Van Dierendonck consolidated research from multiple SMEs and grouped servant leadership characteristics into these six: “empowering and developing people, humility, authenticity, interpersonal acceptance, providing direction, and stewardship.”<sup>82</sup> This style of

leadership aligns closely with both what is desired by a technical workforce as well as those of the Generation Z cohort.

Much like the work environment discussion, this style of leadership may not always be suitable for every situation, especially within a military but Van Dierendonck specifically notes that “working from a need to serve does not imply an attitude of servility in the sense that the power lies in the hands of the followers or that leaders would have low-esteem.”<sup>83</sup> Servant leadership is simply acknowledging that empowering individuals while creating an atmosphere of mutual support is how one can maximize the contributions of each individual and increase the efficiency of the group. Despite the name, the adoption of a servant leadership style is absolutely compatible with a hierarchical chain of command.

## Specific Recommendations

### Pay and Compensation

The pay and compensation changes target two main themes. Modifying existing policies to better compensate those who work longer hours and moving towards a skill-based pay system. New workers place a greater emphasis on flexibility and family, meaning a premium needs to be given to activities that restrict them, such as going to sea. Not all qualifications are created equal, some are harder to obtain or require greater aptitude. Given the willingness of the workforce to change jobs or careers, the RCN needs to be ready to compete in the open market for the skillsets it wants.

Modify sea duty allowance (SDA) such that it is linked to time away from home and increase the rate such that it is more comparable to the “overtime” worked.

- Current starting SDA is \$327 a month which is less than 10% of even the entry-level pay of \$3616 a month.<sup>84</sup>
- Given that a week at sea can easily double or triple the 40-hour work week, SDA is currently a poor substitute for “overtime.”
- However, members posted to sea-going units that are not working additional hours nor spending additional time away from home should not be entitled to SDA.

Modify special leave (mission) to take into account the net amount of time away from home and grant members’ time in lieu accordingly.

- Sailing for three weeks Monday to Friday is 15 days away from home in a month but the leave policy gives no compensatory time off for less than 14 days of consecutive duty.<sup>85</sup>
- Between SDA (financial) and leave (time in lieu) the CAF needs to close the gap to equivalent overtime.

Modify the specialist pay incentives such that there is an element of skill-based pay and such that pay is reactive to the supply and demand fundamentals of the competitive job market.

- Current specialist 1 pay is roughly 10% above base pay which is below the relative premium being paid to STEM/Trade members in the open market.
- Specialist 2 pay is only an additional 10% more and is limited to a small percentage of the population creating diminishing returns. Specialist pay rates need to be increased.

- There is no logic in having spec pay constrained to a certain percentage of the workforce. If the RCN has a higher percentage of technical workers, it should have a higher percentage of members receiving specialist pay.

Implement a financial retention incentive that is reactive and flexible and can be targeted to the specific qualifications, skills and rank levels required.

- Based on other five-eyes (FVEY) allied navies, a roughly 10-15% per year retention incentive is reasonable.<sup>86</sup>
- The RCN needs to retain skilled members to be able to force-generate recruits given the current apprenticeship style of training.
- Even if attrition rates have been steady, a base number of workers is still required for FG. Given the low TES, extra effort should be made to keep each incremental member.

### **Work Environment and Quality of Life**

The work environment and quality of life changes are focused on creating more fulfilling work for those who joined to be technicians while taking steps to address the workload imbalance alongside. If unable to address the workload discrepancy, the RCN should, at the very least, do a better job of recognizing the efforts of technicians. These changes are focused on the normative pillar and redefining the expected roles and norms to create equality.

Balance workload alongside amongst all occupations.

- When in a work period, the entire ship's company should assist in supporting FMF. Duties such as space liaison or fire sentry can be performed by non-technicians.
- Exempt technicians from certain all-ship evolutions when in a work period. This can scale from small things like storing ship to more consequential changes such as cleaning stations depending on the workload.
- Review standard operating procedures to determine which roles can be opened up to all sailors. For example, when fuelling, tank sentry or upper deck sentry do not need to be performed by technicians exclusively.

Provide more meaningful work and create conditions that allow technicians to spend more hours of their day performing technical work.

- Increase parts availability to allow technicians to complete planned and corrective maintenance routines.
- Reduce the number of non-technical tasks being assigned to technicians. Prioritize a technician on technical tasks for which the RCN spent the time and energy training them to do.

Provide better recognition, whether through the existing honour and awards system or via new mechanisms to sailors preparing for operations.

- A ship may spend two or three times more days getting ready for deployment than days on deployment, yet the bulk of honours and awards and financial incentives are for the deployment window.

- The creation of a “maintenance award” along with existing tools such as short leave or “sailor of the quarter” can be used to recognize the often-opaque efforts of technicians preparing the ship for high readiness.
- It is logical and accepted that operators are the focus when the ship is on operations but rarely are maintainers accepted to be the focus when the ship is in a maintenance period.

Track and communicate HR initiatives that are being considered or worked on in an easy-to-find and consolidated fashion.

- The RCAF Operation Talent web page<sup>87</sup> is a good example of how HR initiatives can be consolidated and communicated.
- Sailors often bring up concerns that are in the process of being addressed, but they do not know about it, which means it has no impact on their decision to leave or stay.

## Leadership and Purpose

The leadership and purpose changes look to better align a technician’s professional goals and desires with those of the organization. This can be done by better articulating and messaging how a supporter fits into overall mission success or it can be done by having the organization better value the work of supporters. The focus is on the cognitive pillar and to give purpose to a technician’s role.

Cultivate a servant style of leadership where supervisors are primarily supporting the members doing the physical work.

- Determine the feasibility of closer integration of officers and NCMs throughout their training and leadership development.
- Flatten the hierarchy both in terms of the layers of chain of command as well as the operator to support hierarchy.
- Review processes to shorten the reporting chain from the technician conducting the work to the decision maker.

Clearly articulate a purpose that is likely to resonate with junior sailors.

- “Leadmark 2050”<sup>88</sup> is a good starting point, but the key points need to be condensed and effectively communicated to the workforce.
- There needs to be a tangible linkage between the work sailors are doing and the impact on priorities stated in the defence policy.

## Conclusion

The RCN must make drastic changes to recruit, employ, and retain technicians. Focusing only internally on each occupation (updating occupation specifications) will not be sufficient in tackling the challenges. We will need to look across the entire organization and examine the regulative, normative, and cognitive pillars that impact the current workforce. This includes the willingness to challenge policies that are not directly within the RCN’s sphere of control. It also means the willingness to challenge norms and roles that are engrained in institutional history.

What we are doing now is not working and the trendline continues to move in the wrong direction. Taking the Mar Tech occupation as an example, the TES at the PO2 to CPO2 rank levels is now below 60% and for the 2023-24 FY only 25% of the SIP was achieved. For an occupation that relies on an apprenticeship style of FG, this is a “death spiral.” The RCN is expected to increase the number of technicians it needs as a percentage of its total NCM workforce. This makes solving the technician challenges not only necessary for stabilizing the current workforce but also a vital precursor to building future capability and fleets.

There is no “easy” one-dimensional solution, and drastic changes in terms of compensation and benefits, work environment, quality of life, as well as leadership, and purpose need to be addressed. The level of effort is compounded by not only the shift to an advanced fleet requiring a more technical workforce but also by generational changes and the desires of recruits. Despite a “focus” on reconstitution over the last several years, the lived experiences of junior sailors have not changed sufficiently. Whether that is due to an inadequate scale of policy changes, poor implementation, or ineffective communications is unknown, but the point is, that reconstitution up to this point has not had the impact we need it to have.

As a difficult first step, we have acknowledged we have a problem. The organization is focused, is willing to try new initiatives, and is showing a level of humility it often lacks. The backdrop is set, we just need to take action.

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