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The US Navy Experiment in Optimal Manning – is the Canadian Navy ready aye ready?

By/par LCdr C.S. Corrigan

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Abstract

The combination of increasing personnel costs, declining budgets, and a manpower retention crisis since the late 1990s has caused serious operational readiness and sustainability concerns for the US and Canada. To address this situation, the US Navy is conducting an optimal manning experiment that incorporates new organizational structures, human-centric technology and new platforms with a leaner but more capable crew as its focus. The possible utility and effect of optimal manning on the Canadian Navy to address its operational tempo or sustainability challenges can not be achieved without creating a new force structure of newer platforms with a drastically reduced crew. Despite the apparent success that the US Navy has had with optimal manning, it is an ineffective approach to overcome the current manpower and resource crisis facing the Canadian Navy due to the obstacles inherent in its naval culture and organizational structure and the constraints imposed by its current fiscal and force structure.

The US Naval Experiment in Optimal Manning – Is the Canadian Navy Ready Aye Ready?

Introduction

Since the late 1990s, modern western navies have faced severe challenges to readiness and sustainment due to persistent problems in recruiting and retention of personnel. Erosion of militaries due to personnel shortages have seen qualified personnel leave due to deteriorating quality of life conditions, recruitment lags, lack of advancement and challenging training opportunities. No matter what is the governing naval and fiscal policy within a given state, peacetime navies, except in dismal economic circumstances, have been generally ineffective in retaining their most valuable enlisted personnel.[1] Politicians and military leaders have favoured spending money on ships and weapons than on people, and endorsed common western initiatives such as unmanned gun mounts, automated damage control, engineering and combat systems controls, and the replacement of steam engines with gas turbines as a means to cut manning.[2] Monies are willing to be spent for capital procurement and new technologies but often without sufficient funding to provide for the adequate numbers of trained personnel to man them.[3] Although today's modern warships are manned by less than half of the personnel required for ships of the steam-age, modern western navies continue to seek further reductions through new technology and computerization as personnel costs continue to be high and growing. In response to the end of the Cold War and domestic budgetary

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1 Ronald H. Spector, *At War, At Sea: Sailors and Naval Combat in the Twentieth Century* (New York: Viking, 2001), 392.

2 Dr.Norman Friedman, "DD-21 and Naval Transformation." *Naval Forces International Forum for Maritime Power* Vol. 22 No.4 (2001): 16.

pressures, most NATO countries have faced drastic reductions in their military budgets with a concomitant average reduction of 40% in the number of personnel in uniform since 1985.[4] However, the recent manning crisis in allied navies, and their attempts to introduce measures to effectively deal with the issue is not a new phenomenon, and has been a pervasive part of naval history since prior to World War II.

The Battle of the Atlantic had a drastic affect on three Allied navies – The Royal Navy, The Royal Canadian Navy, and the US Navy – as they each tried to cope with the manning and training requirements to produce convoy escort crews while fighting a war.[5] The lack of sufficient sailors at the beginning of the war was followed by a wartime expansion of the naval services of such a large scale that it caused all three navies to deal with a significant manning and training crisis that threatened the combat readiness and operational efficiency of allied ships. Since the 1960s, various navies have pursued new surface ship design and development programmes to improve efficiency and reduce manning to lower costs.[6] The British showed interest in the design of a TYPE 23 frigate with a very low crew of fifty sailors, but it failed to meet the navy's expectations. The US Navy's experiment with the "smart ship" design to optimize robotics and computers on the Spruance (DD-963) and Ticonderoga (CG-47) classes to reduce manning highlighted that only a radical solution, such as a new ship design, would produce significant personnel reductions.[7] Despite advanced shipboard automation on these ships,

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3 Spector, *At War, At Sea…,* 392.

4 Cindy Williams, *Filling NATO Ranks: Military Personnel Policies in Transition:* Report prepared for the TransAtlantic Roundtable, 8-9 September 2003. (Brussels, Belgium: Transatlantic Center for the German Marshall Fund of the United States, 2004), 4.

5 Stephen Howarth, The Battle of Atlantic 1939-1945: the 50th Anniversary International Naval Conference (Annapolis, MD: Naval Institute Press, 1994), 188.

6 Chuck Good, "Who's Left to Paint?" *U.S. Naval Institute of Proceedings* 122, no. 4 (April 1996): 48.

7 Friedman, *Naval Forces…*, 16.

the increase in administration, maintenance and preservation requirements have required the crews to increase 20-25% since their introduction into the fleet.[8] The combination of increasing personnel costs, declining military budgets, and a manpower retention crisis in the 1990s has caused serious operational readiness and sustainability concerns for many modern western navies, including the US and Canada. Militaries must compete formidably with a lucrative private sector for critical specialist trades, and face the challenges of retaining officers who are more apt to view their profession in peacetime as less than a long-term career.[9]

In 1998, the resultant deterioration of the US Armed Forces was the focus of major congressional hearings to address these escalating problems impacting the military's readiness, and led to President Clinton's promise to find more money to stop the attrition. Only eight years after the Persian Gulf War, the US was short 1,000 pilots and 18,000 sailors and was challenged to mount a similar military operation, despite Pentagon reassurances otherwise to this embarrassing accusation.[10]

The scenario for the Canadian Armed Forces with respect to personnel strength and sustainment has been equally abysmal. The Auditor-General highlighted this situation in her 2002 Report by stating that since 1992, the trained effective strength in the regular force has averaged 92% of the military population and projections have shown that it will drop below 80% after 2004.[11] Unlike Europe, both Canada and the US have growing populations, mainly as a result of immigration, and should be able to draw

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8 Good, "Who's Left to Paint?"…, 48.

9 Spector, *At War, At Sea…,* 392.

10 Steve Forbes, "Our Undermined Military." *Forbes, New York* Vol. 162 Issue 9 (Oct 1998): 31. Journal on-line; available from http://proquest.umci.com (ProQuest); Internet; accessed 29 August 2003.

on their respective eligible workforce to sustain their militaries at their current size. However, despite this potentially optimistic demographic picture, a recent NATO report from a meeting held in Brussels by twelve NATO countries in September 2003 on personnel and pay policies, stated:

> In Canada, immigrants often have a negative image of the military and the opportunities for educated immigrants in the private sector are good even in the first generation. Thus, immigrants are less likely to volunteer for service than the English and French speakers who predominate in Canada's military.[12]

Furthermore, the Preferred Manning Level (PML) or Regular Force total strength has been set at 54,820 for 2004/05, and will decline to 54,700 for 2005/06, which is significantly short of the 60,000 target of the 1994 White Paper which was deemed necessary to meet the mandate of making a genuine contribution to a wide variety of domestic and international objectives through combat-capable forces.[13]

Within the Canadian Navy, an even more distressing naval personnel shortfall manpower situation is evident. Results of a recent MARCOM Impact study conducted in 2002 stated that the navy is critically short in 45% of its naval trade classifications. Although some ground has been gained in the last couple of years through recruiting and retention initiatives, 7 out of 25 naval trade classifications are still assessed as distressed, of which 3 are considered to be in a critical state.[14] These shortages significantly impact naval operations and must be addressed to alleviate further personnel concerns. To put this into an operational perspective and the potential operational impact on readiness and

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[11] Office of the Auditor General. *2002 Report of the Auditor General of Canada* (Ottawa: Office of the Auditor General, April 2002), Chapter 5; available from http://www.oag-bvg.gc.ca/domino/reports.nsf/html/0205ce.html; Internet; accessed 14 April 2004.

[12] Cindy Williams, *Filling NATO Ranks*…, 6.

[13] Department of National Defence. *1994 Defence White Paper.* (Ottawa: Department of National Defence, 1994), 46. / DMHRR website – Projected Status report fall 2003

[14] Information obtained with permission from lecture given to CSC30 naval students by Cmdre Thiffault A/CMS (C/MS/MCP-303/DI-1).

sustainment, the current naval personnel shortfall equates numerically to the manpower of three Halifax class frigates (FFH).[15] The operational tempo of OP APOLLO from 2001-2003, with 16 out of 18 of the Canadian Navy's ships deployed in support of this mission, has only exacerbated the fragility of personnel sustainment and operational readiness. On the completion of OP APOLLO, the Navy announced it would be entering a regenerative period or operational pause until October 2004 to address a critical shortfall in deployable personnel, core training and equipment maintenance and repair. From a fiscal perspective, the Canadian Navy's allocation of funding only supports what is deemed as absolutely essential tasks with a growing bow wave of deferred activities. There is a growing gap between required and actual funding for the Navy to fulfill its assigned Defence tasks with current demand for funding within the Navy exceeding its allocation by over $100,000 or approximately 25% of its current budget.[16] Without an infusion of funds to the Navy to increase baseline funding, which is achievable only through an overall increase in Canada's defence budget, this situation will not improve and will gradually worsen as infrastructure and ships continue toward obsolescence and the manpower crisis threatens the Navy's ability to sustain operational readiness.

While Canada's navy is still on the precipice of manpower unsustainability with no means articulated by senior leadership to achieve the strategic outline in HR Strategy 2020 or Leadmark 2020, the US Navy has made political, strategic and organizational changes through a vision articulated in Seapower 21 that has changed its course and rescued it from its manpower crisis. Admiral Vern Clark, the US Chief of Naval Operations, has chartered a new course of transformation for the US Navy to take

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15 *Ibid.*
16 *Ibid.*

advantage of new technologies, more effective training, optimal manning, and a new family-of-ships construction programme to meet the imperatives outlined in their Defense Planning Guidance and Quadrennial Defense Review. The US Navy has recognized the significance of placing the right sailor at the right place at the right time to maximize operational readiness to meet a vast array of perceived threats and mission areas of sea strike, sea shield and sea basing. The US Navy's optimal manning experiment (OPE) and fleet manning experiment (FME) will determine optimal current and future force structures for its various ships, through human-centric technology and incorporating new organizational structures and culture with a leaner but more capable crew as its focus. The resultant reduced total ownership cost to the Navy per vessel combined with an all time high situation of personnel retention is proving their personnel strategy is online with their Seapower 21 objectives. Other navies, such as the Royal Netherlands, Royal Australian Navy, Royal Navy and German Navy are also designing and building ships with human-centric technology and process improvements to reduce the manpower required for tasks such as food preparation, ordnance loading and underway replenishment. There is considerable effort being expended today by western navies to enhance capability while reducing the size of the crew to optimal levels due to fiscal and personnel constraints.[17]

As a medium power navy, the Canadian Navy does not have the fiscal resources to be able to afford a family-of-ships shipbuilding programme enjoyed by its US counterpart. However, where the Navy could make in impact, little has been done to address the personnel issue of naval readiness and sustainability. If the optimal manning

[17] Simon Hughes, "The Canadian Navy of 2030: Personnel Reductions." (Toronto: Canadian Forces College Command and Staff Course Paper, 2002), 32.

model is working in the US Navy, why hasn't the senior leadership of the Canadian Navy embraced this concept to solve its similar ills?

Regrettably, the optimal manning experiment being conducted in the US, will not address the Canadian Navy's personnel and readiness challenges over the next two decades. Whereas the US Navy has the fiscal flexibility and cultural motivation to embrace personnel policy changes and transformation, such as the OME, to fund as many of their ships to sea, there is no impetus for organizational change within the Canadian Navy that directly translates into a similar solution to address unmanned hulls and resource deficiencies. To be fair to the Canadian Navy, there is very little discretionary power it has to invoke change, as DND's centralized and corporate control of personnel and fiscal resources have resulted in a unified National Defence Headquarters (NDHQ) that does not provide for the same total ownership and control of assets within the Canadian Navy as is the case within the US Navy. Without the means or authority to administer all resources within the Navy, including personnel, it is impossible to internally fund modernization and recapitalization through optimal manning or any other best practice. Additionally, the US Navy has also embraced technological and organizational changes both afloat and ashore in order to cross-train optimally personnel in core responsibilities with a focus on enhanced knowledge, whereas the Canadian Navy has demonstrated parochialism with respect to invoking evolutionary changes to naval trade specifications and shipboard watch organizations. Lastly, the US Navy, due to its continuous shipbuilding programme, sheer size, support infrastructure, and robust financial and political support, can achieve success with optimal manning that Canada as

a medium-power navy with less global aspirations and resources to fund new technologies and ships, cannot.

The US Navy experimentation with optimal manning has shown promise of success in increasing efficiency and reducing manpower. However, the Canadian Navy within a unified organizational military structure, does not control nor has access to the resources to administer personnel, infrastructure and ships in order to invoke change on a grand scale to improve efficiency. The Canadian Navy does not have the same mandate as the US of responding to the full spectrum of military conflict globally, the magnitude of resources, nor a large infrastructure base. With a more limited mandate and funding envelope, the Canadian Navy is comprised of comparatively older ships and a smaller organizational base that is already lean, and there is little impetus or flexibility for change within this organizational construct. The possible utility and effect of optimal manning on the Canadian Navy as a means to achieve the tasks outlined in Leadmark 2020 will not address the operational tempo nor sustainability challenges inherent in them, without building a new force structure of new platforms with a drastically reduced crew. The reality is that the Canadian Navy will remain as a fleet in being with the ships it has today, with a couple of minor exceptions, for the next 20 years. Despite the apparent success that the US Navy has had with the optimal manning experiment, it is an ineffective approach to overcome the current manpower and resource crisis facing the Canadian Navy due to the obstacles inherent in its naval culture and organizational structure and the constraints imposed by its fiscal and force structure.

Section 1 – US Experimentation with Optimal Manning

From 1985 onwards, the US Navy's total budget declined by 40% while Operation and Support (O&S) costs remained constant. By 1989, the Defense budget had declined from a high of $425 billion during President Reagan's term in office to $380 billion.[18] During the post Cold War period, further downsizing occurred within the Defense Budget, which culminated in a $270 billion low point in 1998.[19] The result of dramatic military fiscal cutbacks from 1989 to 1998 caused the military to voice publicly its "crisis in military readiness" which the Clinton administration addressed with huge federal surpluses and at the behest of domestic political pressure.[20] Despite an average increase of $14 billion over 1998 levels, the military still argued that it faced an annual shortfall of $30 million to address the sustainability crisis caused by reductions in troop strength, combat force structure, military infrastructure and modernization plans for the military.[21]

For the Navy, it became imperative that savings be generated in O&S in order to finance fleet modernization and recapitalization from within. Since personnel costs comprise 50% to 60% of the O&S portion of the budget, it was necessary to reduce the number of personnel necessary to crew the ships of the future as well as those ships comprising today's fleet. This first focus on optimal manning of surface ships included the importance of all components of manpower costs including retention, recruiting, and

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18 Cindy Williams, *Holding the Line: US Defense Alternatives for the Early 21st Century* (Cambridge, Mass.: MIT Press, c2001), 4.
19 *Ibid*, 5.
20 *Ibid,* 6.
21 *Ibid,* 6.

training on the total ownership cost (TOC) of the surface fleet. Over the years and with limited success, the USN attempted various programs, such as Smart Ship, to manage more effectively ownership costs throughout the lifespan of its fleet assets and generate savings for modernization and recapitalization.

During an October 1999 House Armed Services Committee hearing on military readiness, Chairman Floyd Spence commented, "What has not changed… is that despite significant congressional increases in the defense budget this year and over the past five years, serious mismatches still exist between the requirements imposed on the services and the resources being budgeted to address them.[22] As a result, the Naval Research Advisory Committee (NRAC) was chartered "…to review and assess the efforts to date to optimize manning on surface ships….to identify technological opportunities…. and recommend changes in procedures and policy that would hasten and improve efforts to optimize ship manning in the Navy."[23] The NRAC's assessment of why the Navy's attempt to date to reduce manning, maintain readiness, and leverage technology to improve shipboard life had failed was attributable to "…a lack of top-down leadership and an articulated implementation strategy."[24] It recommended four changes that the Navy would have to accomplish to achieve its goal of lowering TOCs through optimally manned ship development programs: a CNO appointed Flag Board to implement strategies to ensure procedural, technological and organizational changes were adopted through the Navy; ships designed to be human-centric so that optimal human and system

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[22] Scott C. Truver, "Tomorrow's US Fleet." *United States Naval Institute Proceedings* Vol.126 Issue 3 (Mar 2000). Journal on-line; available from http://proquest.umi.com (ProQuest); Internet; accessed 27 October 2003.

[23] NRAC Executive Summary. "Optimizing Surface Ship Manning." Available from http://nrac.onr.navy.mil/webspace/exec_sum/99op_man.html; Internet; accessed 9 January 2004, 1.

[24] *Ibid,* 1.

integration is achieved with as few sailors as possible; and modifications to personnel strategies such as recruiting, training, compensation and career progression to reflect the need for a different skill set and greater decision-making abilities in a more automated and optimally manned ships. [25] These recommendations were heeded by Chief of Naval Operations, Admiral Vern Clark, and incorporated into his priorities and vision for the US Navy as Seapower 21 in June 2002. In order to fund the Navy of the future, Admiral Clark promoted a culture of improved productivity and minimizing the total number on the payroll in order to streamline and better align the Navy's manpower structure.

As a result of the billions poured into retention, recruitment and training of sailors, the US Navy has reduced at-sea manning shortfalls by more than 36% in 2002 with record level retention translating into the lowering of recruiting goals by 7,500 sailors.[26] With a focus on a more responsive force to fulfill the national security requirements of the 21st century, the US Navy promoted initiatives to create an environment that offered opportunities and personal as well as professional growth. Several HR strategies were targeted in the areas of recruiting, retention, attrition, force shaping, detailing and optimal manning and sea swap to achieve their manpower requirements and create optimal efficiencies in support of current and future readiness. As a testament to their success, the US Navy achieved C-2 manning status (no combat critical manning deficiencies) for all deploying battle group units at least six months prior to deployment.[27]

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[25] *Ibid,* 2.

[26] United States, United States Navy, *Chief of Naval Operations – Guidance for 2003*. January 2003; available from http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2003.html; Internet; accessed 9 January 2004, 2.

[27] *Ibid,* 2.

At the 2003 Human Systems Integration (HSI) symposium held in June 2003, Admiral Vern Clark (CNO) stressed the criticality of HSI to naval readiness and the importance of the sailor in systems development to achieving a flexible and survivable surge force – the intent of Fleet Response Plan (FRP) for the 21st century.[28] Through engineering and acquisition focused on human systems integration in LCS, CVN21 and DDX future fleets, the Navy will shape systems to optimize sailor performance and knowledge and enhance ships readiness. However, the CNO was also quick to add that tremendous cultural, as well as organizational change was required within the Navy to deliver the right readiness due to the impact this concept would have on the way fleets are operated and maintained today and in the future.[29]

With the manpower crisis behind it, the US Navy has now focused on a greater current readiness and responsive surge capability to respond to global crises while fulfilling national security requirements at home and abroad. The naval initiative titled Sea Warrior - "the right skills, in the right place, at the right time" - focuses on new platforms, technologies, rotational crewing concepts and revolutionizing crew sizes to maximize combat effectiveness and sustainment through the streamlining and alignment of manpower and skills mix.[30] The global CONOPs behind Seapower 21's vision requires a fleet of 375 and a procurement of 11 ships per year which necessitates a more efficient consumption of taxpayer's resources.[31] In defining the desired end-state of optimal manning, Admiral Clark has remarked:

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28 The United States Navy - Program Executive Office Ships – June 2003 News http://peos.crane.navy.mil/newsjune03-60.htm; accessed 9 January 2004.

29 The United States Navy - Program Executive Office Ships…, accessed 9 January 2004.

30 United States, United States Navy, *Chief of Naval Operations – Guidance for 2003…,* 6.

31 *Ibid,* 18.

> Whether addressing the need to optimize the crews of our in-service ships or to determine the right-sized crews of our future ships, optimal manning is neither minimal manning, nor even reduced manning. Optimal manning is the right-sized crew necessary to carry out the mission requirements…Too many, and costs cannot be afforded; too few, and missions cannot be performed well.[32]

The US Navy's optimal manning experiment works and lessons are being applied to their current force and to the sizing of their force of the future with their overriding objective being "…to more effectively man our ships and reinvest the resultant manpower savings into the type of transformational technologies required for our 21st-century force."[33]

Currently the US Navy is conducting the Optimal Manning experiment on three ships – USS Mobile Bay (CG 53), USS Milius (DDG 69) and USS Boxer (LHD 4) with a reduction of crew strength ranging between eight and nineteen percent of crew strength.[34] Ship Manning Documents are being changed for their respective classes to incorporate the lessons learned from the adoption of these new manning practices. The USS Milius, as the first guided missile destroyer to deploy under the Optimal Manning experiment, has used new technologies and deckplate leadership and produced "… innovative shipboard watchstanding practices, reduced ship's manning requirements, and focused Sailors on their core responsibilities and a reduction of 53 billets."[35] Indications thus far have been positive with no effect on the crew being able to maintain, fight or run the ship. When 60-65 % of ship's budgets fund personnel accounts, getting the optimum

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[32] NAVSEA, "Optimal Manning is Not Minimal Crewing: The Need for Human Systems Integration." *NAVSEA News Wire* (26 September 2003). Available from http://www.globalsecurity.org/military/library/news/2003/09/mil-030926-navsea02.htm; Internet; accessed 9 January 2004, 1.

[33] Timothy W. LaFleur, "Change, Innovation, and Transformation: Today's Surface Force – Ready to Move at Flank Speed Into the 2lst Century," *Seapower* (September 2002): 42.

[34] Admiral Walter F. Doran, Commander US Pac Fleet, Address at the SNA Membership Luncheon 16 Jul 2003. Available from http://www.cpf.navy.mil/speech/speeches/030716.html; Internet; accessed 9 January 2004, 3.

from each individual sailor onboard is instrumental in reducing total ownership costs to the navy, which allows for rerouting of funding toward fleet readiness and quality of life initiatives. A review is now underway respect to the manning of submarines and air forces to further gains realized from optimal manning experiments to date. Technical support and technology enablers are being identified to support development of this strategy throughout the US Navy and manpower-intensive functions at sea and ashore are under process review with many impacting on logistical functions such as Underway replenishment (UNREP) process and gear, food preparation, material receipt and issue, inventory control and postal operations.[36]

As a corollary to optimal manning, the Sea Swap initiative has paid huge dividends in saving millions in transit fuel costs and increasing forward presence and time in station without lengthening deployment times for four DD crews and three DDG crews who were swapped over 2003.[37] In the 1980s, US ships were able to spend four month uninterrupted presence in the Indian Ocean as a result of robust watchbills and a significant self-repair facility; today, less manpower intensive fleet support ashore is replacing ship self-reliance by streamlining personnel onboard in order to achieve proclaimed efficiencies in ship's readiness and total ownership costs.[38] This end-state was remarked upon by Admiral Clark stated in his CNO Guidance for 2004 document that in 2003 "…the fleet produced the best readiness levels I've seen in my career and

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[35] United States, United States Navy, *Chief of Naval Operations – Guidance for 2003…,* 2 and NAVSEA, "Optimal Manning is Not Minimal Crewing…, 1.

[36] United States, United States Navy, *Chief of Naval Operations – Guidance for 2004*. January 2004; available from http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2004.html; Internet; accessed 9 January 2004, 9.

[37] *Ibid*, 2.

[38] Good, "Who's Left to Paint?"…, 48.

demonstrated its ability to respond with overwhelming force."[39] Of the six action items he has instructed his Flag officers to lead in 2004, his direction to streamline and align total manpower structure is a vital enabler in delivering the right readiness and demonstrating enhanced Fleet Response Plan (FRP) surge capability. The US Navy plans to continue the momentum of the last three years in its quest for an optimal sea and shore structure and creating tools and incentives to attract the right talent. From 2003-2009 Admiral Clark has projected a reduction of approximately 25,000 Navy personnel and savings of billions of dollars, yet even with these reductions, personnel costs will continue to rise as a result of rising health care and retirement costs and pressure will continue to be applied to keep reshaping the Navy to deal with the realities of tomorrow.[40]

Seapower 21 is the vision to deliver enhanced warfighting capabilities through new concepts, technologies, organizational initiatives, and improving acquisition processes.[41] Because of the tremendous progress and improvements made recently in the US Navy in the areas of manpower and alignment, quality of service and current readiness, it can now focus its energy on future readiness and beyond jointness to "true interdependence" in the development of its warfare doctrine of the future.[42] CNO guidance to leaders directs that all naval acquisition and R&D programs will embed a human performance systems model in order to leverage technology and improve performance and minimize manpower costs.[43] The USN espouses a new culture of readiness made possible by improved productivity through Sea Enterprise initiatives that

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39 United States, United States Navy, *Chief of Naval Operations – Guidance for 2004…,* 2.
40 Sheila McNeill, "Note to Congress: Be Careful What You Ask For," *Seapower* (March 2004): 3.
41 United States, United States Navy, *Chief of Naval Operations – Guidance for 2003…,* 10.
42 United States, United States Navy, *Chief of Naval Operations – Guidance for 2004…,* 12.

will capture business efficiencies to free resources for investment in warfighting capabilities and to attain the strategic objective of a 375 ship Navy of the future, built on new families of ships that are optimally manned with drastically reduced crews. [44]

DD(X) is the centerpiece of a family-of-ships construct, a land-attack destroyer, which will be acquired to enable a future US Surface fleet to deliver a broad range of combat capabilities with the future cruiser (CG(X)) and the Littoral Combat Ship (LCS). With a focus on speed, stealth, and commonality among components, the DD(X) will displace 12,000 to 15,000 tons, and be about one third larger than the Arleigh Burke class guided missile destroyer, and three times larger than a Canadian Halifax Class frigate of 4800 tons.[45] The contract award for the DD(X) is scheduled in fiscal year 2005 with the lead DD(X) being funded from RDT&E monies (research, development, test and evaluation) appropriations rather than from the US Navy's operational and support budget.[46] As a vital enabler of Seapower 21, is represents a "sea base" from which to take the fight to the enemy and project power ashore as a multi-mission surface combatant with long-range offensive firepower. It is the embodiment of the US strategic plan to have more firing capability to support land operations through state-of-the art railgun weaponry generated from the ship's electric-drive, and a cheaper option to the US$1 million Tomahawk.

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43 *Ibid,* 15.

44 *Ibid,* 20.

45 Fred T. Jane, 1865-1916. *Jane's fighting ships.* London : Jane's, 1914-: 88, 828 and Jane's www.janes.com; Jane's Sentinel Security Assessment – North America; Procurement – Defence Equipment Requirements; http://www4.janes.com/K2/doc.; accessed 7 March 2004; 7.

46 Scott C. Truver, "A Cornerstone Force of Proven Strength: Surface Warfare Vision: A "Family" Affair." *Seapower* (September 2002): 33.

One of the key attributes of this future fleet enabler is optimal manning and low total ownership costs (TOC).[47] With a crew objective of only 95 mandated for the DD(X) class, radically different ways to fight and operate this multimission and complex warship are required that focus primarily on the human. A total paradigm shift is required to conceptualize the reduction of crew from 440 to 95 in the DD(X) class, and tackle successfully the associated manning challenges of crew mix, skills, rating structures, watchstanding requirements, career paths and training. In the original DD(X) Operational Requirements Documents (ORD), a Key Performance Parameter (KPP) for the ship's crew was included for the first time in the history of the Navy and illustrates the focus of ship design to support the crew in carrying out tasks in an information-rich, and distributed battlespace.[48]

The DD(X), like all classes of ships in the future, must be fully mission capable, affordable, and designed for the sailor, with QOL as a highly valued indicator of success. Human-centered design technologies can provide a 2-1 manning reduction in combat information center systems with optimal performance, by ensuring human related issues are adequately addressed throughout the systems engineering process. Human systems integration can assist in analytically determining the crew size consistent with risk, affordability, human performance capability and human workload to improve total system performance and a significant reduction in ownership costs. With the sailor as a decision maker rather than a data integrator, much of the human intervention with current systems onboard can be eliminated in order to achieve the optimal manning targets

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[47] The United States Navy – Naval Sea Systems Command – Programs DD(X) http://www.navsea.navy.mil; accessed 9 January 2004.

envisioned.[49] The penultimate goal is to optimize sailor performance and integrate improved design features and processes into shipboard combat, administrative, logistical and engineering systems.

Using force structure projections and optimal manning initiatives, DD(X) is focusing design criteria toward a sailor-centric architecture. This approach differs from the typical acquisition strategy to date, in which manning levels were established in support of the equipment, and in particular, from a viewpoint of system operability and maintainability requirements. The US Navy vision behind the DD(X) family of ships and its force structure of the future, will be to employ new technologies that increase automation, redundancy, survivability, and persistent combat power while reducing personnel demands. [50] However, with every evolutionary change in an organization, many obstacles lay in its path, which can cause challenges and resistance to achieving that desired end state. The key will be to make the philosophy more than another paper experiment of words and a short-lived successful trial, and to ensure that the diverse institutional and cultural impediments within the US Navy to change, like in any bureaucratic organization, are overcome. The displacement of many routine technical functions, particularly in the engineering and logistical departments, to ashore or second-line entities contains an inherent risk to ship self-sustainability and technical skill erosion. Critics of this new approach to ship manning are not convinced that the trade-off of

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[48] Scott C. Truver, "Transforming the Navy for a Knowledge-Centric Environment." *Seapower* (September 2001); available from http://www.navyleague.org/seapower_mag/sept2001?web_wall_ice.htm; Internet; accessed 9 January 2004: 3.

[49] Trish Hamburger, J. Robert Bost, and Jennifer McKneely, "Optimal Crewing for Surface Ships," Available from http://www.manningaffordability.com/s&tweb/PUBS/Optimized_Crewing_rev1; Internet; accessed 9 January 2004: 2.

[50] Charles Hamilton and Donald Loren, "It's all in the family," *United States Naval Institute Proceedings* Vol.128 Issue 8 (August 2002). Journal on-line; available from http://proquest.umi.com (ProQuest); Internet; accessed 27 October 2003: 4.

losing shipboard technical expertise in the new age of a lean crew of "Sea Warriors" optimally supports operational readiness and sustainability.

Numerous initiatives have contributed to the current readiness success enjoyed by the US and the at-sea billet gaps reduction from more than 17,000 in 1998 to less than 4,000 in 2002.[51] One of these initiatives was the standing up of the Naval Sea Systems Command (NAVSEA) Human Systems Integration Directorate in September 2000, as a single POC to measure the degree that sailors are considered in system development and that sailor performance is integrated into system design at the beginning of the acquisition process for existing and future surface ship and submarine training systems. Within this blend of behavioural science and engineering, human beings are being considered as integral warfighting elements in the design, engineering, acquisition, maintenance, and operation of the service's ships, aircraft, and weapons, and increasingly critical to mission success. The fundamental premise behind Human Systems Integration, to influence system design such that human capabilities and limitations are considered to produce the highest and safest performance at the lowest TOC, requires a solid commitment as it has the potential to affect virtually every aspect of Navy manpower and personnel planning.[52] Both the USS Mobile Bay and USS Milius illustrate the shift in culture, organizational structure, and functional responsibilities onboard that are necessary to achieve the reported success to date with the experiment in optimal manning. The effort has been focused on transferring preventive and corrective maintenance, as well as some supply and disbursing functions from ships to shore, and

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51 NAVSEA, "Optimal Manning is Not Minimal Crewing …, 1.

52 *Ibid,* 1 and Scott C. Truver, "Transforming the Navy for a Knowledge-Centric Environment…, 3.

implementing alternative policies and procedures with new technologies to determine if savings can be made through gained efficiencies.

When the USS Mobile Bay left San Diego back in July 2002 in support of Enduring Freedom, she proceeded on a six-month high readiness deployment to the Persian Gulf with 60 fewer crew members – a 20% reduction – and became one of four ships in first wave of crew reductions.[53] The challenges were in the greater responsibility, not necessarily more jobs, expected of the sailors who are normally trained to perform one or more tasks but now are trained in seven or eight disciplines. Several initiatives were undertaken as a result of the reduced manning: routine inspections were dropped; video cameras and electronic sensors were installed to detect mechanical problems; meals and laundry became self serve; and boarding party members were given other on-board tasks in addition to security functions. Initial indications of optimal manning on a high readiness ship seem favorable with the USS Mobile Bay having conducted more than 120 boardings of merchant vessels in support of Enduring Freedom, with high morale, and re-enlistment rates at a record level.[54]

The plan for the USS Mobile Bay and USS Milius is to go through an entire deployment cycle with these new manning levels. As a result of, and in addition to the initiative undertake above, certain supply ratings will be either posted ashore or reassigned, pay and personnel ashore (PAPA) functions will be transferred, postal clerk functions will be replaced by a stamp machine, and the number of food service attendants (FSAs) will be reduced on the ship. The Commanding Officer of USS Milius sees

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[53] Transcript. "Profile: Navy's Experiment of Optimal Manning." *Morning Edition, Washington D.C.* (12 December 2002); transcript on-line; available from http://proquest.umi.com (ProQuest); Internet; accessed 27 August 2003; 1.

[54] *Ibid,* 2.

optimal manning as a means to improve the QOL for his sailors and has stated: "…my sailors didn't join the Navy to become food service attendants – reducing the number of FSA billets means less time as an FSA and more time in the individual Sailor's rate."[55]

Greater use of video cameras for remote monitoring has reduced the need for ships to have 24-hour manning of certain watches and distance support software will provide increased capability to access technicians ashore. Distance support means not requiring experts on every system on board, but rather someone with fundamental skills to interface with experts. Distance support is a fundamental change to the way the US Navy does business with respect to engineering support, but it is being viewed as being better.[56] After spending $8M in flying technical representatives around the world to fix ships, the US Navy has turned to internet technology to engage distance support as the first solutions considered in resolving maintenance problems.[57] With optimal manning, the bulk of billet reductions come from policy changes that remove sailors and their jobs ashore. Under this new construct, ships will have some of their preventive maintenance done in port by specialized groom teams composed of sailors from the respective ships who have gone ashore to form special SIMA detachments responsible for maintenance, or will have contracted technical support to outside service providers. This has the potential to reduce shipboard preventative maintenance by at least 25 %.[58]

With respect to watch-and-station bill and damage control organization, procedural changes have reduced the number of billets required through the consolidation of the boatswain's mate of the watch, quartermaster of the watch and signalman of the

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55 Ron Flanders, "Optimal Manning Project Enters Next Phase," *Naval Sea Systems Command website.* Available from http://www.navsea.navy.mil; Internet; accessed 9 January 2004: 1.

56 *Ibid*, 1.

57 Timothy W. LaFleur, "Change, Innovation, and Transformation…, 43.

watch into a signal position called the Bridge specialist. Electronic and information systems technicians are being cross-trained, and a more flexible rapid response to damage control is being implemented by the use of one robust repair locker instead of three to fight a main-space fire.[59] Optimal manning and the resultant crew reduction, necessitated finding better ways to fight damage underway and in port without requiring so many sailors or so much time. This translated into a new damage control philosophy that involved the reorganization of repair locker teams, heavy reliance on halon fire suppression systems and alarms while underway or in port, and video camera installation to monitor remotely 40 different locations from a Combat Systems Maintenance Center. Additionally, shore-based facilities are relied upon to complete some of the ship's damage control maintenance and to perform planned repair division maintenance checks. The leadership challenge is ensuring that the new techniques of combating damage, standing watches in port and underway, and increased dependence on technology and shore support, all provide the crew with an easier way of doing business at no cost to safety.[60] The overall key of OME is that the mission of the ship does not change, and that the manpower reductions are absorbed in the reorganization of work and responsibilities through doing it smarter and maximizing the benefits of technology.

During a visit in late 2003 to US Central Command area of operations (CENCOM AOO), the CNO praised USS Milius for its success in it implementation to date of the optimal manning model. In carrying out the intent of his guidance in 2003, the ship

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58 Ron Flanders, "Optimal Manning Project Enters …, 2.

59 *Ibid,* 2.

60 Mary Katey Hays, "Optimal Manning Experiment Changes Damage Control Philosophy," *Fathom (*January – March 2003). Available from http://www.safetycenter.navy.mil/media/fathom/issues/janMar03/optimal.htm; Internet; accessed 9 January 2004.

combined new technologies, solid deckplate leadership, innovative shipboard watchstanding practices, reduced ship's manning requirements and focused sailors on their core responsibilities. Integral to maintaining the US Navy's readiness and achieving the Seapower 21 vision, is putting the right sailors in the right place at the right time and providing opportunities for sailors to serve in more challenging and rewarding jobs through an internal investment in professional edification and development.[61]

When Admiral Vern Clark took over command of the US Navy in 2000, he established five priorities to focus the Navy's way ahead: manpower, current readiness, future readiness, quality of service and alignment. [62] As 2003 approached, the first two priorities were under control and attention shifted to future readiness, and a Navy wide effort to better structure the fleet of the future. While the West Coast continued with the OMP, the East Coast was tasked to commence a Fleet manning experiment on a range of fleet assets including the USS Nassau (LHA 4), USS Monterey (CG 61), USS Mahan (DDG 72), and the submarine USS Oklahoma City (SSN 723), aircraft carrier USS George Washington (CVN 3), and the Strike Fighter Squadron 34 (VFA 34). The purpose of FME was to determine the best mix of sailors with the right kind of skill sets needed to operate a ship or squadron with today's missions, and given current distribution systems, technology and support structures.

The focus has been to re-evaluate current manning levels by going back to the drawing board and creating a set of standard operating procedures that accurately

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[61] Walter T. Ham, "CNO Praises USS Milius for Optimal Manning Success," *Navy Newsstand* (Story No. NNS030212-08, 2 December 2003). Available from http://www.news.navy.mil; Internet; accessed 27 August 2003.

[62] Interview with the CNO. Seapower (October 2002): 25.

represent the numbers and qualifications of sailors needed to man the fleet. Personnel have been transferred to and from the commands involved as manning levels have been adjusted, and a close watch has been maintained on any detrimental effects on the individual sailors/aviators as a result. If for example, a ship accomplished all tasks but retention and morale suffered, the evaluators were tasked to determine if the FME manning levels contributed to that outcome as they assessed the inter-deployment training cycle of those participating in the experiment from Jun 2002 to 2003.[63] The first two ships to commence the FME, the USS Mahan and USS Monterey, experienced 78 reductions, and 35 reductions, respectively. Interestingly to note, only 17 of the total positions cut from these two ships (11 USS Mahan, 6 Monterey), required outside assistance to the ship for continuation of these functions on its behalf.

In both cases, the supply department absorbed about 15% of the reductions, which necessitated the following: the installation of newer food service equipment; standardized menus maximizing the use of advanced food; pier side assistance for Depot level repairable (DLR) and Residual Asset Management (RAM) material turn-in; Logistics Support Centers (LSCs) to provide manpower to run the ships hazardous material centers when in port; and the maximization of Fleet and Industrial Supply Centers in assisting the fleet with logistical functions.

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[63] Dave Lee, "Fleet Manning Experiment to Determine True Warfighting Manpower Requirements," *CNSL's Press Releases* (June 5, 2002). Available from http://www.cnsl.spear.navy.mil/PR/; Internet; accessed 9 January 2004: 1-2.

generation of warships that will have significantly smaller crews. The impact of a successful personnel reduction program can save a large navy, like the US, millions of dollars. A 2% reduction in ships alone translates to 7or 8000 people; however, this initiative could potentially increase the shore establishment to service these ships and significantly impact on current ship-to-shore ratios. The FME will expand to much larger ships, and the plan for the amphibious assault ship USS Boxer is to transfer 10% of the 1000 member crew off the ship to other Navy jobs.[64] Needless to say, as the optimal manning project expands within the US Navy, new and challenging problems will arise for recruiting career progression, skill development and crew continuity.[65] Major changes in navy culture, concomitant with experiments in optimal manning must occur in order produce enduring success of this evolutionary change to the way the US Navy is to be structured in support of Seapower 21.

Recognizing the importance culture plays in securing success of major organizational change, eight US naval flag officers were asked to make recommendations of cultural changes they felt would best support the Navy's long term vision and goals. In order to enhance the probability of success for optimal manning in the fleet certain areas were considered worth careful attention and monitoring by senior leadership such as: outsourcing, survivability, and ship ownership by the crew.

In order to sustain the optimal manning construct, assured access to outsourcing various support tasks, including food service, general cleaning, working parties, and facilities, maintenance particularly while ships were in port would have to be secured whether at home or abroad. Any new damage control organization would have to resolve

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64 Transcript. "Profile: Navy's Experiment of Optimal Manning." *Morning Edition* …, 2.

65 Trish Hamburger, J. Robert Bost, and Jennifer McKneely, "Optimal Crewing for Surface…, 2.

the fundamental inconsistency between optimal manning and the reliance of large damage control parties, who by their size and employment, ensures a degree of survivability. Improved damage control processes and technology was seen as the means around the labour-intensive practice of damage control of the past. It is no secret that a crew's strong loyalty to its ship produces a cohesiveness and galvanizing force during stressful battle scenarios when maximum effort and willpower are critical for success. The flag officers cautioned against poorly designed crew manning and crew rotation schemes that could demoralize and strain the unit cohesion beyond repair. Optimal manning projects, in consort with other crew rotation schemes such as Sea swapping, offer cost reductions but are only valuable to the extent that loyalty and ownership by the crew are preserved or improved.[66]

There are also other inherent risks with optimal manning. With a reduction of shipboard personnel, the reliance on automation and shore support increases. Depending where one finds oneself in a globally deployable environment, and whether that environment is hostile, seabasing over the horizon may not provide the adequate support needed. Distance support and ashore facilities may not be accessible to provide the manpower to perform those functions that are not done onboard anymore with the minimal manpower available. These potential problems have not come to light yet thus far in the optimal manning project, as the operating environment for the US Navy abroad has not provided a scenario where a logistics footprint ashore was not available within a friendly environment.

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[66] Michael G. Mullen, "Cultural changes: What stays and what must go," *United States Naval Institute Proceedings* Vol.126 Issue 1 (Jan 2000). Journal on-line; available from http://proquest.umi.com (ProQuest); Internet; accessed 27 October 2003: 1.

The visibility and benchmarks personally overseen by the CNO makes the optimal manning experiment very high profile and results orientated. In order to make this project work in the short term, there must be Commanding Officers who would put their career on the line and crews who would refuse to let their ship fail no matter what the cost. Ships, which do not have this level of devotion and sacrifice, are often able to maintain a temporary façade or appearance of success that is not sustainable beyond the next crew rotation, if that long. It was stated in a recent critique of the USCG optimal manning experiments that: "The most critical part of optimal manning is the subtle people, system and organizational dynamic interactions that drive personnel sacrifice related motivation, performance and devotion to duty. Stove piped design and problem solving will produce divergent solutions that will severely damage the CG and Navy's infrastructure."[67] One can see that without the requisite total asset ownership, control of service personnel and fiscal resources, commitment to personnel QOL, large support infrastructure as an enabler, and a willingness to avoid cultural parochialism, optimal manning for the US Navy would fail. When the publicity and high profile status of optimal manning experiments wanes, its longevity beyond the current platforms and crews under experimentation, and its long-term feasibility to support Seapower 21 will be tested, as the new family-of-ships with severely reduced crews emerge as the fleet in being.

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[67] Kevin J. Russell, *Rethinking Reduced Manning Design and Optimization Using a Modified Systems Approach*. Symposium Paper prepared for the Engineering the Total Ship (ETS) 2000 Symposium 21-23 March 2000. Dahlgren, VA; Naval Surface Warfare Center, 2000 : 11.

Section 2 – The Canadian Navy's Current Personnel and Readiness Challenges

When reviewing naval literature for an indication of the Canadian Navy's position in addressing its manning situation and personnel system, one will find only a single paragraph in Leadmark 2020 that is devoted to sailors. Briefly stated, it recognizes the need to position the Navy as the "employer of choice" in order to address the criticality of recruiting and retention of sailors "…with the essential skills and competencies to handle the complexities of our new equipment, and to function effectively in the more complex security environment of the future.[68] Yet, as Commodore Girouard stated in his recent thesis: "The CF is not currently perceived as an employer of choice… and some continue to assert that the CF does a better job of maintaining its equipment than its people."[69]

With respect to addressing the Navy's current manning crisis, the Chief of Maritime Staff (CMS) stated in a recent MARCOM Impact Assessment for the three-year planning period commencing April 2002 that: "…the navy has reached the point where there is little flexibility left in the sustain agenda.…the maintenance of balance between sustaining current capability at a minimum level, investing in Quality of Life and Quality of Work….generating savings for the future and implementing change continues to be elusive.[70] Personnel shortages continue to cause most naval military occupations (MOCs) to be in distress. The TES for those MOCs managed by Chief of Maritime Staff (CMS) as of Oct 2003, falls short of the PML by approximately 600 personnel which represents an overall shortfall of 7% between actual and preferred manning levels.

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[68] Chief of the Maritime Staff. *Leadmark: The Navy's Strategy for 2020*. Ottawa: Directorate of Maritime Strategy, NDHQ/Chief of the Maritime Staff, 2001: 69.

[69] Roger Girouard, "Seeking Flexibility and Fulfillment: Providing Wins on Multiple Levels," Victoria: Royal Roads Thesis Paper, 2001, 44.

Although progress has been made in various HR strategies, the Navy continues to face serious personnel shortage in several MOCs and at certain rank levels. As a result, the Chief of the Maritime Staff (CMS) has directed within his Maritime Command Planning Guidance (MCPG) for 2004, that: "MARCOM must continue to support naval retention and recruitment programmes as well as supporting ADM(HR-Mil)'s recruiting initiatives" in an effort to provide some relief to this tenuous situation.[71] Given the situation the Canadian Navy currently faces, why has senior management not taken similar action to that of the US Navy in addressing its navy personnel and readiness challenges?

There are numerous differences in scale between a Navy of a superpower such as the US, and a medium power navy, which is found in Canada; these differences are most noticeable when comparing relative numbers of personnel, ships and tempo of operations. The US Navy has approximately 378,000 sailors on active duty and another 150,000 on ready reserve.[72] This compares to approximately 8,800 Regular force and 4000 Reserve naval personnel in Canada.[73] As of 5 February 2004, the US had 39,428 on deployment. Of the 292 ships and submarines in its fleet, 103 are on deployment and another 155 are underway (away from homeport).[74] Canada has currently one ship deployed on a six-month deployment with 25% of the fleet in a cyclical repair or refit schedule, and the remaining ships participating in work-ups and/or Task Group exercises close to home. Whereas all US carrier strike groups (CSGs) and Expeditionary Strike Groups (ESGs)

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70 Simon Hughes, "The Canadian Navy of 2030: Personnel Reductions…, 11.

71 Department of National Defence. *MARCOM Capability Planning Guidance 2004…,* 10.

72 The United States Navy – Status of the Navy Website – http://www.chinfo.navy.mil/navpalib/news/.www/status.html ; accessed 8 February 2004.

73 Department of National Defence. *MARCOM Capability Planning Guidance 2004*. Ottawa: Chief of the Maritime Staff, 2004, 4.

74 The United States Navy – Status of the Navy Website – …

have been deploying at manning levels close to 100 percent and retention rates are at all time high at 80%, Canada has two minor coastal defence vessels and one command and control ship unmanned alongside as a result of personnel and fiscal constraints.[75] As stated before, the current manning shortage across all naval trades equates numerically to the manpower of three Halifax class frigates (FFH). With precious few ships in its inventory, every ship alongside due to manning or fiscal shortages represents a significant capability that is underutilized and highlights a flawed readiness and sustainment policy within the Canadian Navy. However, senior management in the Canadian Navy repeatedly sends the message up the chain of command that the Navy "can do" and continues to do so in the absence of a stable and viable long-term operational readiness and sustainment (R&S) strategy.

Prior to OP APOLLO, the essence of the Navy's R&S strategy was contained in two MARCORDs. MARCORD 2-10, which has been in draft form and served as an interim R&S guidance for several years, provides direction on ship activity, maintenance and crewing levels to accomplish the assigned Defence Planning Guidance mission of generating, employing, maintaining, and sustaining balanced, multipurpose, combat-capable maritime forces to meet Canada's defence objectives. MARCORD 2-12 provides the guidance as to how a ship transitions to and maintains an assigned readiness level through a Tiered Readiness Programme (TRP) of high, standard and extended readiness. IAW with this policy ships were to be manned and maintained in accordance with their operational status in order to address the navy's resource shortfalls while maintaining some form of operational capability. This draft TRP was created in 2001 in response to a MARGEN released by CMS, which directed that the Navy will produce a

[75] Timothy W. LaFleur, "Change, Innovation, and Transformation…, 42.

comprehensive R&S system by adopting a tiered readiness system. However, this R&S strategy did not have time to be implemented and validated before the 9/11 events occurred.

In its contribution to the war against terrorism, the Canadian Navy surged 16 of its 18 ships, four Task Group staffs, and 15 organic helicopter air detachments in five rotations in support of OP APOLLO.[76] It was an unprecedented period of high operational tempo and experience for the Canadian Navy; however, this tempo was not sustainable and stretched the Navy in hulls, air frames, and personnel. As a result, the CMS announced that the Navy would enter a period of regeneration until October 2004 to enable the ships, helicopter detachments, personnel, and shore-based organizations to slow down and focus primarily on core training through Task Group exercises. Currently the R&S policy is being overhauled by MARCOM with input and feedback from the Formations and CMS has provided direction in a letter dated 8 July 2003, on his short-term expectations for Maritime Task Group readiness requirements. In short, the letter amended the MARCOM capability planning guidance for 2004 as follows:

a. MARPAC shall re-generate the Contingency TG (10 days notice to deploy) to be operationally ready for late 2004;
b. MARLANT shall re-generate the National TG (60 days notice to deploy) to be operationally ready for 2005;
c. MARLANT shall assume responsibility for generating the Contingency TG from spring 2006 onwards; and
d. During the re-generative period (18 month period following date of letter to execution of sub-para a above), MARLANT and MARPAC are each to generate and maintain a single VANGUARD unit at 10 days readiness and recognize that there may be a requirement to generate a MARLANT/MARPAC composite TG in lieu of a standing TG during this period.[77]

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[76] *Ibid,* 7.
[77] CMS signed letter CMS: 1000-25-4 (MSMT) dated 8 Jul 03.

Although the current R&S policy is considered to be dormant, MARPAC is still using the TRP model to get ships ready for high readiness in November 2004, through a tempered approach to ship's readiness whereby operational imperative dictates repair and maintenance priorities and manning levels on a case-by-case basis. Lack of bodies still plagues the navy, and Fleet staffs still try to man the ships in accordance with the operational schedule (OPSKED) from High to Low readiness in consultation with the career managers and other managing authorities for personnel training and employment. As a signpost of the resource impoverished circumstances within the Canadian Navy, it was recently announced in December 2003, that HURON, a virtually unmanned command and control ship tied up alongside since October 2000, will never sail again and be decommissioned in the near future due to lack of personnel and funding.

Within the MCPG 2004, CMS directs that focus must resume on producing an affordable and workable R&S policy and sees this document as key for the follow-on development of material and personnel support policies and "…must also address crewing concepts that will relieve personnel pressures."[78] With the serious personnel deficiencies at certain rank levels and within technical MOCs, submarine officers, and MARs directors and controllers, MARCOM is to continue supporting naval retention and recruitment programmes and support ADM (HR-Mil)'s recruiting schemes.[79] One of the important factors to be considered in the next planning period, as outlined in MCPG 2004, is the need for a MARCOM Strategic Plan. This plan would fill the current void between the Maritime Capability Plan (MCP), which has a lifespan of three years, and the strategic vision contained within Leadmark for 2020. Whatever the format this plan

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78 Department of National Defence. *MARCOM Capability Planning Guidance 2004…,* 8.

79 *Ibid,* 10.

eventually takes, it must be affordable, achievable and take into account Naval Force Development Goals within a broad context of an approved CF structure.[80] If reduction of personnel through optimal manning is a viable means to resolve the Canadian Navy's personnel recruiting and retention challenges and a means to fund modernization efforts, how do we get there from here when human resource management is not at the sole discretion of the Environmental Commander?

Commodore Girouard espouses in his thesis paper that the ability for the Canadian navy to sustain its effectiveness in the long term will depend "…on the ability to change the fundamental philosophy by which the Navy manages its human resources."[81] Whether the future of the Canadian Navy sees optimal manning as a viable means to sustain operational readiness and alleviate the ongoing challenges of fiscal and personnel shortages, will depend entirely on how important the senior leadership views it as a critical enabler to achieving the strategic vision contained within Leadmark 2020, and whether it is willing to change the fundamental culture of the Navy to do so.

Section 3 – Utility and Effect of Optimal Manning on the Canadian Navy

In discussions pertaining to the RMA and transformation effects on military

achieve an acceptable level of safety and operational effectiveness with a reduced crew, and less cost. As stated earlier, the US Navy has a long history of attempting various approaches to this theory, and the Canadian Navy has also tried to employ optimal manning objectives to a lesser degree.

When the Canadian Navy had the Halifax class frigates built, attempts were made in its design to incorporate some of the US Navy Smart Ship or optimal manning principles in the automation of damage control and engineering monitoring systems which reduced workload, improved quality of life and combat readiness, and provided some cost savings by reducing the amount of personnel required onboard. However, continual refinements to the Navy's R&S policy, critical manning shortages for deployments, and lack of funding for maintenance, indicate that this is not enough and that the Canadian Navy can not afford to not look at certain aspects of optimal manning if the Navy of the future is going to be capable to fulfill its roles as specified in Leadmark 2020. However, with the exception of the proposed two to three new Joint Support Ships (JSS), the Canadian Navy faces a major limitation in its ability to implement human-centric systems, increase automation and utilize optimal manning in a fleet that will age for another 15 to 20 years before any prospect of major recapitalization materializes.

The newly titled JSS has risen from the ashes of the stalled ALSC (Afloat Logistics Sealift Capability), as a CMS priority to replace the aging AORs (Auxiliary Oil Replenishment) ships. The intended crew reduction of 50% from the current manning of an AOR represents a drop from 330 to 165 of crew onboard.[82] Optimal manning of the JSS will only work if a reassessment of required capabilities is done correctly. For

[82] Information obtained with permission from lecture given to CSC30 naval students by VAdm Buck CMS (C/JC/CPT-303/LE-16).

example, for years the AORs have been manned to crew potentially a four point RAS (replenishment at sea) in case the requirement ever existed to perform a port and starboard simultaneous heavy jackstay, fos'cle transfer, and a possible vertical replenishment by helicopter. Other than for training purposes, and the testing of the validity of a ship's organizations, this capability has never been utilized, yet the Navy has attempted to man these ships based on this premise since their commissioning into the service in the mid 1960s. Based on the reduced size of the ship's company for the JSS, only a three point RAS capability is workable, and even then, meticulous rationalization will have be undertaken to find the right mix of lane meters, hanger/deck space, amphibious capability and sailor skill sets to satisfy all of the proposed JSS capabilities.

If human systems integration is carefully incorporated into the design of command and control, damage control and engineering systems, and certain onboard functions onboard become self-serve or moved ashore, then reduced manning objectives could be attained for the JSS. The problem lies in the fact that if the JSS is to be designed and built from a prototype either offshore or in Canada, the earliest the Navy will see this new ship is 2010-2012. The benefits to the Navy from the acquisition of three of these ships will not be realized in the short-term unless the Canadian Navy buys a similar off-the-shelf version of the JSS which already incorporates automation and optimal manning arrangements, such as the new San Antonio class LPD that is currently being built in Australia for the US Navy/Marine Corps.

However, the reduced indigenous capability and flexibility to perform both boardings and tanker responsibilities, as well as field a force protection force alongside

without the assistance of shore support, will be the trade-offs for a reduced crew. Roles for the JSS will also have to evaluate carefully surge capabilities required to provide the support onboard for a possible medical hospital, JHQ, army troop and equipment lift or humanitarian missions. The other services, in true joint fashion, may have to provide the manpower to augment the nominal crew to fulfill these roles and perform the associated duties as required. The critical manning shortage of sailors within the Navy of today makes finding the personnel resources to mobilize the manpower required for the various roles of the JSS a challenge, for which a solution has not been clearly articulated by senior management.

Seaswapping, another variation to the theme of optimal manning, could also be a means to meet the Canadian navy's global requirements without extending deployment timelines and without sacrificing the quality of life for sailors. The US Navy has had great success in employing this technique with the two ships to date, as a feasible option to meeting its forward-presence requirements on a longer term basis. Instead of staying on station for only six months, ships are conducting 18 month deployments with the crews rotating every six months.[83] By rotating the crews vice the ships that are already in a theatre of operations, on-station time is increased and the fuel costs and mechanical fatigue associated with multiple transits are reduced. Two months of a six month deployment were spent transiting to and from the Gulf, for those west coast Canadian ships assigned to OP APOLLO. For the AORs and Command and Control ships (280s), for which Canada had only 2 and 3 respectively available, this has meant gaps in the Canadian commitment to the theatre commander when ships had to rotate out of theatre

[83] Timothy W. LaFleur, "Change, Innovation, and Transformation…, 43.

without an immediate replacement. Had seaswapping been considered as a means to man optimally the scarce resources the Canadian Navy had, it would have provided greater options for a continuously deployed asset with access to in-theatre maintenance periods as required.

Since Canada acquired twelve Minor Coastal Defense Vessels (MCDVs) for employment by the Naval Reserves, there have always been two tied up alongside the dock as a result of lack of personnel to man the ships and operating funds to maintain all twelve at a standard state of readiness. Homeland security concerns continue to remain at the forefront since 9/11 and coastal surveillance will continue to play a large role in Canada's ability to protect its shores and citizens from threats to it national sovereignty and security. MCDVs, representing sunk funds to the taxpayer, are a wasted asset unmanned alongside when utility could be found for them in a role beyond reserve training that will no doubt emerge from a Defence Review or promulgation of a National Security policy with a probable greater role for the Canadian Navy in coastal surveillance and protection. Employing optimal manning strategies across all MCDVs such as reorganization of watches, streamlining of capabilities and functions, and greater employment of automation and self-serve shipboard processes would achieve manning efficiencies that could be reinvested into the manning of the remaining ships that are currently tied up alongside.

With the Command and Control ships approaching obsolescence and the end of their lifespan around 2015, the Navy will have to replace them with a similar capability should it wish to maintain its current national task group structure and the ability to command a multi-national NATO or coalition naval task force such as

STANAVFORLANT and similar coalition operations led by the Canadian Navy during OP APOLLO. In order to save monies with a common hull design, CMS is looking at a single combatant ship that could be modified for C2 functions as well as serve as the next hull for the frigate replacement. It is imperative that the design for this ship has a human-centric focus from its conception, in order to streamline manpower intensive functions and achieve efficiencies accruing from human systems integration. Unfortunately, there are limiting factors in producing this ship solely in Canada, as the shipbuilding industry has significantly deteriorated in the last 10 years as cheaper foreign options for ship design and hull construction have highlighted the unaffordability of supporting a national shipbuilding industry for a medium-power, peacetime navy.

Clearly it is no longer acceptable to maintain the status-quo approach by the CF and the Navy with respect to its people. It is highly unlikely that there will be a significant turn around in the recruiting and retention problems, as well as fiscal restraints, that have plagued the CF in the past decade, based on historical evidence and future workforce competition and trends. Despite the efforts to strategize HR issues through high-level policy documents, such as HR Strategy 2020, there are no documented means or framework anywhere on how to achieve the manpower needed to fulfill the fundamental roles of the Navy as delineated in Leadmark 2020. A single paragraph in this strategic document recognizes the importance of manpower and the need to attract those that can function effectively in a more complex security environment of the future, yet it is extremely short on details. Nothing has been produced that links the operational end-state of 2020 with a tangible course of action – a Maritime strategic plan – that aligns force structure goals with optimal manning to sustain an operationally ready Navy. The

reality is that demographics and fiscal restraints will dictate that the Canadian Navy will have to find a way to better manage its increasingly scarce human resources, and utilize initiatives like optimal manning, combined with sailor-centric systems and platforms, as a means to that end. But optimal manning is not a panacea in itself to resolving the resource issues that confront the Canadian Navy in meeting Leadmark's vision.

Existing operational and personnel tempo, and fiscal and HR trends constrain and hamper the navy's efforts in the vital areas of O&M, recapitalization, modernization, recruiting and retention. The navy needs to find more money or redirect monies for O&M and modernization to avoid rust-out and remain capable to fulfill its roles within the strategy laid out in Leadmark 2020. The unlikely resolution to the critical shortage of personnel within the Navy further threatens the sustainability and readiness of the Navy to meet its operational commitments. Reduced crew sizes can lower personnel resource costs as sea while augmenting billets ashore with positive effects on quality of life, recruiting, and retention. Unfortunately, the structure and culture of the Canadian Navy is not permissive to allow the maximum benefits to accrue from optimal manning initiatives, and thus is doomed to fail to achieve the success that the US Navy has had with its manning experiments to date.

Between 1995-1997 the Management, Command and Control Re-engineering Team (MCCRT) was stood up to re-engineer the CF with the overall purpose of reducing overhead, primarily headquarters' staffs, in order to better align resources with operational imperatives. Unprecedented level of operational deployments combined with federal budget reductions and a diminishing CF necessitated a reduction of overhead in order not reduce the multipurpose combat capability that the CF was mandated to provide

through the 1994 White Paper. Ultimately, all corporate and central processes were evaluated and decentralized if possible, to make NDHQ a much smaller, simpler, streamlined and less resource intensive.[84] Although many functions were re-engineered or devolved, it was decided that military personnel management and funding would remain a functional stovepipe within ADM(Mil-HR) rather than devolve to the Environmental Commanders. This form of personnel administration has resulted in a Canadian military culture and organization that is vastly different from that in the US Navy. Within the unified Armed Forces construct, the Chief of Maritime Staff has neither total ownership of his assets nor total control over the employment and training of personnel within his command. Capital procurement monies are controlled and apportioned from National Defence Headquarters through a Strategic Capital Implementation Plan (SCIP) and likewise, recruiting and military personnel salaries are centrally controlled. There is little to compel the Navy to promote savings through optimally manning initiatives when the results of efficiencies within the Environmental Command can not be directly applied to fund internal recapitalization and modernization of the fleet.

Conclusion

Over the last ten years, western navies such as the US and Canada have had to grapple with the reality of fiscal restraints and a manpower shortage that threatened current and future readiness. The fight for sustainability and operational readiness of

[84] Department of National Defence. *MCCRT Historical Repo*rt. Ottawa: Department of National Defence, 1997, 3.

military capability in achieving the strategic vision of their respective services, has become the focus. The CNO of the US Navy, in his Seapower 21 vision, sees optimal manning of the current fleet and future family of ships as a vital enabler in funding and sustaining a fleet of 375 ships that can project force worldwide. His guidance for 2003 and 2004 directed the conduct of optimal manning experiments within the fleet and reduction of ship's manning by 11-20% through functional reorganization, watchstanding and organizational changes, deckplate leadership, removal of labour-intensive functions with an increase in automated systems. With respect to the future fleet, the DD(X), CG(X) and LCS family-of-ships are being designed from a sailor-centric perspective with human systems integration optimizing human performance, drastically reducing crew strength to 95 for the DD(X), and enhancing operational capability and safety. Savings accruing from lower total ownership of assets is being used to fund the modernization and recapitalization of the US fleet in support of the strategic objectives within Seapower 21. The CNO has praised the efforts to date and acknowledged that the manpower crisis and its effects on current readiness are now under control.

The Canadian Navy has faced similar personnel and fiscal restraints, but unlike the US Navy, its manpower and fiscal crisis continues. Leadmark foresees the navy strategy for 2020 as being able to continue the development of a highly adaptable and flexible force, and able to provide the government options across a continuum of domestic and international contingencies up to mid-level military operations. [85] Although Maritime doctrine and capability planning guidance acknowledges the importance of manpower to the sustainability of the Navy's operational readiness, without the existence of a linkage document such as a Maritime Strategic Policy, there is no policy link as to

how the Navy gets from a chronic shortage of personnel and resources to the long-term goal of optimally manned ships that are combat capable and sustainable. There has been no top-down leadership guidance on this issue from senior management like there has been in the US Navy, through CNO guidance that clearly gives the priorities, means, resources and specific direction to his flag officers to spearhead his intent on the way ahead.

Although the avenues are limited where optimal manning could be explored and have a significant impact on the current Canadian fleet and that of the future, the fact remains that only passing tribute is given in any promulgated HR strategies and capability planning guidance as to the need for a sustainable, well-adjusted, optimally manned fleet. Although Leadmark 2020 and HR Strategy 2020 both refer to people as the foundation of the organization; how to take that critical resource and devise sustainable employment strategies has yet to materialize two to three years after these documents have been produced. Reduced manning exists on many ships today in the fleet, but not as a product of an optimal manning strategy, but rather as a result of a chronic critical manning shortage. The MCDVs in particular, and other ships need to have ship's documents reassessed, standard operating procedures reassessed, and roles and capabilities re-evaluated, with a goal of leveraging human-centric innovative technology to modern the fleet and reduce ship's manning within a realistic operational readiness and tempo framework. Proposed JSS and single combatant ship discussions seem to indicate reduced manning will be a fundamental construct to these new platforms but these ships are 10-20 years in the making to have any impact on current fleet manpower or readiness challenges. When these ships do materialize, it will be essential

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[85] Chief of the Maritime Staff. *Leadmark: The Navy's Strategy for 2020…*, 168.

that the design, acquisition and system interface, take into account human performance factors from the very beginning of the SOR process if the desired end-state of more capable and optimally manned ships is to be achieved. Unfortunately, optimal manning and its effectiveness as a means to attain a viable readiness and sustainment policy will not materialize without a concomitant organizational, fiscal and cultural shift within the Canadian navy.

The current stove-piping and centralized management and control of personnel resources along functional lines, leaves the Environmental Commanders without a total ownership of assets which is an important factor in having a successful impetus for change and adoption of optimal manning strategies. Without ownership and control of naval recruiting and personnel training and employment, CMS has no ability to retain the savings accrued through improvements to human resource management within the Navy to sustain the current fleet and invest in the fleet of the future. Unfortunately, this is the organizational reality of a unified Armed Forces that will not change in Canada in the foreseeable future. Senior management within the Navy must find a means to work within this construct and commit to leading an aging fleet through cultural and organizational change and a viable long-term R&S strategy that includes realistic optimal manning arrangements to address its personnel and fiscal challenges.

With regard to those areas that the Navy does has influence or control over, senior management must spearhead a top-down leadership approach that forces the organizational or cultural changes necessary to permit successful implementation of beneficial optimal manning practices. For example, if food services was streamlined and reorganized on Canadian ships as has been on the US ships under optimal manning

experimentation, stewards would lose their billets on ships and their justification for existence as a naval occupation. In US ships, the net result of an adoption of self-serve food lines and laundries, as well as advance food preparation techniques has been the elimination of a secondary duty as food service attendant for naval tradesmen onboard, and not the removal or the purpose of an occupation as would be the case in a similar Canadian context. The elimination of one trade, and the probable downsizing of another under this model, would be an unprecedented for the Navy, and most assuredly, one highly contested by the both the cook and steward trades.

On the surface, the reorganization of damage control organizations, watch-and-station bills, and the reduction of personnel required to stand engineering watches due to an increase in remote sensors and alarms, seems palatable for the Canadian Navy as a means to reduce ship's manning. However, as force protection has intensified in the wake of 9/11 for ships at sea and alongside, the number of people required to protect the ship in this function has increased dramatically. In order to determine what level of optimal manning is to work in Canadian ships, force protection requirements at sea and alongside for the various threat levels envisioned must be enunciated and clarified in Ship's standing orders for the various ships so that appropriate manning consideration may be taken into effect. During OP APOLLO, ships were normally standing a one –in-four duty watch rotation alongside with upwards of 75 people on duty at any one time. Proposed crew structures for the new single/common combatant ship of 150 and 165 for the JSS make these numbers required for force protection infeasible. Whereas the US Navy relies heavily on force protection from their shore facilities staged abroad or through a sea basing concept, Canadian ships rely heavily to the crew onboard to satisfy

this requirement, and will continue to do so in the foreseeable future unless the other services will be able to provide support for those duties. Canadian Forward Logistics Sites (FLS) and National Support Units (NSU) have not had traditionally the resources to sustain this role on behalf of the ships when alongside, and nor can the Canadian Navy afford the immense logistical and support footprint ashore, soon to be seabased, that the US Navy enjoys through sheer size and fiscal superiority.

The only way the Canadian Navy after Next is going to be ready to fulfill its fundamental roles of defending National and Allied commitments, supporting Canadian foreign policy, and securing and protecting Canadian sovereignty will be through the production of a sustainable R&S strategy with longevity over time. Optimal manning as a means to contribute to that end-state, as successfully exemplified by the current US experiments and future plans for the new family-of-ships in support of Seapower 21, is limited in its effectiveness as a means to achieve the strategic vision of Leadmark for the Navy due to its cultural, fiscal, organizational, and economy of scale differences. Only on a limited scale can the Canadian Navy incorporate automation and optimal manning arrangements with an aging fleet and with only one new type of ship, in the form of a JSS, committed for acquisition in the next 10-20 years. However, the time has come after seeing the high tempo effects of OP APOLLO on fleet assets and personnel, for CMS to produce a focused Maritime Strategic Plan with sufficient detail to address operational tempo, readiness and sustainment, and optimal employment of personnel in the face of scarce resources. Recapitalization and modernization of the fleet will have to occur by 2020 in order to achieve the vision of Leadmark; therefore a sound strategic long-term plan must be the Navy's priority if it hopes to adapt to the fiscal and manpower

challenges it faces as a medium power navy that is struggling to maintain relevance and sustainable capabilities in the future.

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