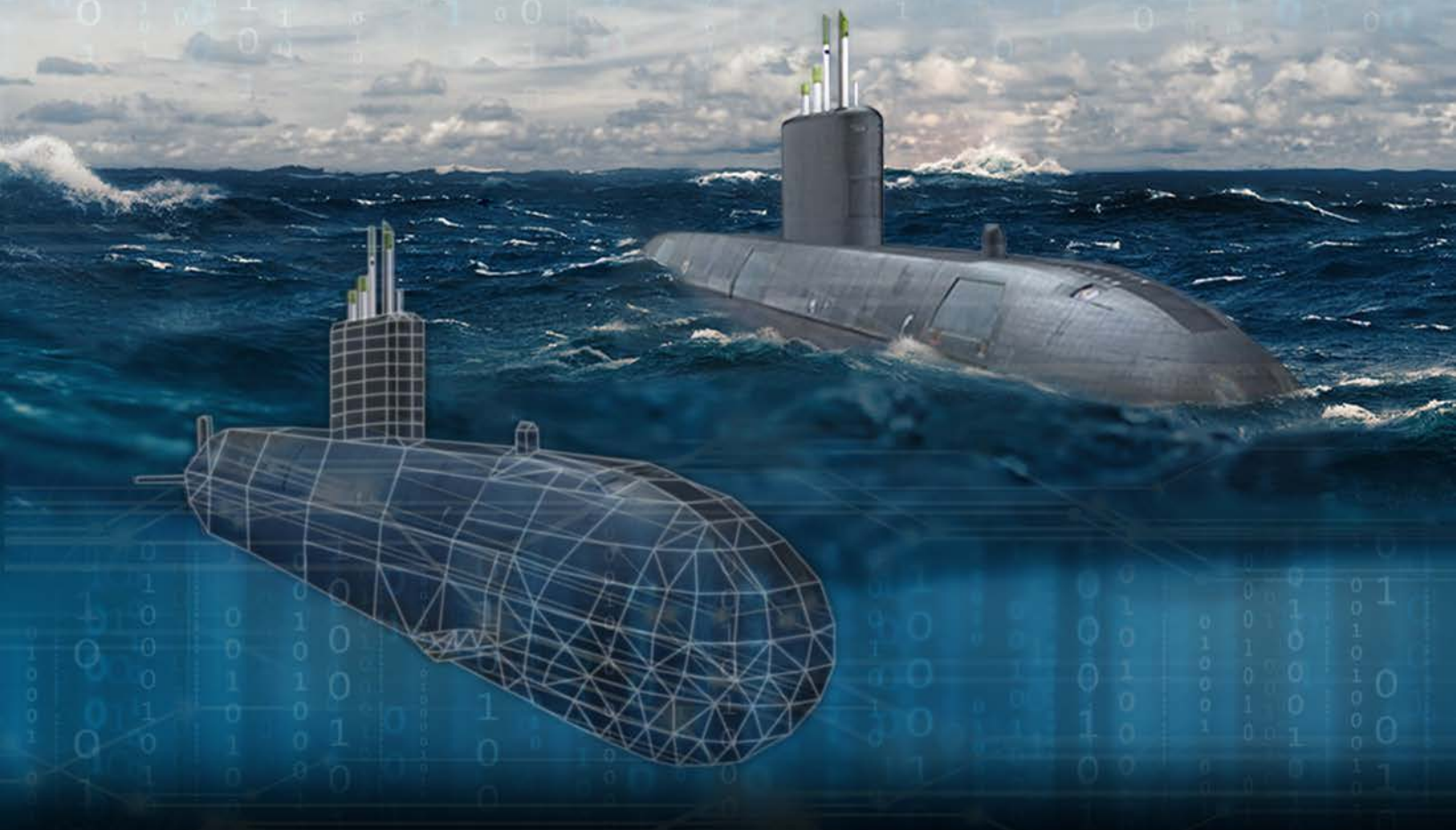


DIGITAL NAVY ACTION PLAN



CANADIAN
ARMED FORCES



FORCES ARMÉES
CANADIENNES

CONTENT

Foreword	3
Introduction	4
Digital Navy Information Flow	5
Returns and Reports	6
Finances	6
Approach to Work Prioritization	6
Digital Navy Initiatives	7
Deliver a digitally-enabled future fleet (DGNFD and DGFSC)	7
Increase the use of digital technologies to improve the delivery of materiel sustainability for the RCN (DGMEPM and DGNSR)	9
Leverage digital technologies to attract and retain a motivated, technologically-oriented RCN workforce (DGNSR)	12
Further exploit digital technologies to improve the delivery of individual training and military personnel readiness (A/CNS P&T)	13
Increase the use of digital technologies to enhance the delivery of readiness and combat effectiveness (A/CNS AT&R)	16
Advance business management and communication practices through the innovative use of digital technologies (DNSM)	17
References	19
Annex A – Terms of Reference	
A-1 Terms of Reference - Digital Navy Champion	20
A-2 Terms of Reference – Functional Authority Implementation Lead	20
Annex B – Mandate – Digital Navy Office	21
Annex C - Use Cases	
C-1 Naval Training System of Tomorrow	22
C-2 Naval Training System; Personnel and Training Management	23
C-3 Accommodation Reservations	24
C-4 Managing Crew Volatility	25
C-5 Small Boat Database	26
C-6 Managed Readiness Plan (MRP) / Operational Assignment Schedule	26
C-7 Digital Twinning	27

FOREWORD

I am pleased to introduce this Digital Navy Action Plan to the dedicated members of Canada's naval team. It serves to clearly outline how we will work together to realize the ambition and vision articulated in the companion document, *Digital Navy: Enabling Canada's Naval Team for the Digital Age*, which should be read in conjunction with this plan.



The scope of our action plan is broad, covering all areas of the naval enterprise and all members of the naval team. It captures the first tranche of activity that will be pursued over the next 24 months as we continue to build upon and accelerate the digital initiatives that have been launched across the Navy in support of the overarching innovation agenda laid out in Canada's defence policy, *Strong, Secure, Engaged*.

The approach we have adopted for this plan leverages best practices from industry and reflects where we are as an organization on our digital journey. Many of the initiatives contained herein are exploratory in nature and are designed to facilitate the learning that will be necessary to make optimal use of digital technologies in the years ahead. Equally important, the methods that we will employ are intended to foster the cultural changes that will be needed to enable the RCN to innovate with more agility so that we can keep pace with rapidly evolving digital technologies.

I encourage all members of the naval team to lean into this action plan with true a spirit of innovation and a willingness to do things differently. Working together in this way will ensure that the RCN remains a credible naval force in the years ahead that is in all respects, *Ready to Lead, Ready to Help, and Ready to Fight*.

A handwritten signature in black ink, appearing to be 'AM', with a long horizontal line extending to the right.

Vice-Admiral Art McDonald
Commander Royal Canadian Navy

INTRODUCTION

This action plan identifies and describes the digital initiatives that will be undertaken by the Royal Canadian Navy over the next two years to further the vision laid out in *Digital Navy – Enabling Canada’s Naval Team for the Digital Age*. The initiatives described herein span all elements of the naval enterprise and are intended to assist members of naval team as they explore and develop potential applications for modern digital technologies within their respective areas of responsibility. Exploration of these technologies will largely be executed as short-term pilot projects employing agile design methodologies that facilitate rapid, iterative learning while driving the changes needed to foster a more innovative, experimental and risk-tolerant culture. This action plan should be read in conjunction with its companion document, *Digital Navy: Enabling Canada’s Naval Team for the Digital Age*, in order to understand the context and overarching direction related to our digital initiative.

In order to enable rapid learning of the vast potential afforded by modern digital technologies, this action plan will be refreshed on a regular basis in consultation with stakeholders. The next iteration of this document will be released in FY 21/22.



DIGITAL NAVY INFORMATION FLOW

The activities within this plan have been organized along naval functional lines. Accordingly, RCN Functional Authorities will be responsible for advancing the digital initiatives within their respective areas of responsibility and accountability. As depicted in Figure 1, Functional Authorities will report directly to CRCN on the progress of their digital initiatives, while Director Digital Navy will report to CRCN through DGFSC on the programmatic aspects of the Digital Navy initiative.

Functional Authorities will be supported by Digital Navy Champions at the Capt(N) level who they will assign to oversee the implementation of their respective strategic objectives. Champions will be supported by Implementation Teams that will directly advance the specific digital initiatives contained in this plan. Composition of the Implementation Teams that will be at the discretion of Functional Authorities, but should be led by an individual at the Cdr or equivalent level. Generic Terms of Reference for the Functional Authority Digital Navy Champions and Implementation Leads are provided Annex A.

Champions and associated Implementation Teams will be supported by a Digital Navy Office (DNO) within Navy Staff Headquarters led by Director Digital Navy. The DNO will manage the programmatic aspects of the initiative, drive coherence of effort, and facilitate sharing of information across functional lines. It will also establish contract vehicles through which Functional Authorities can access subject matter expertise in digital technology areas and advice/assistance on the organizational aspects of digital transformation. The mandate for the DNO can be found at Annex B of this document.

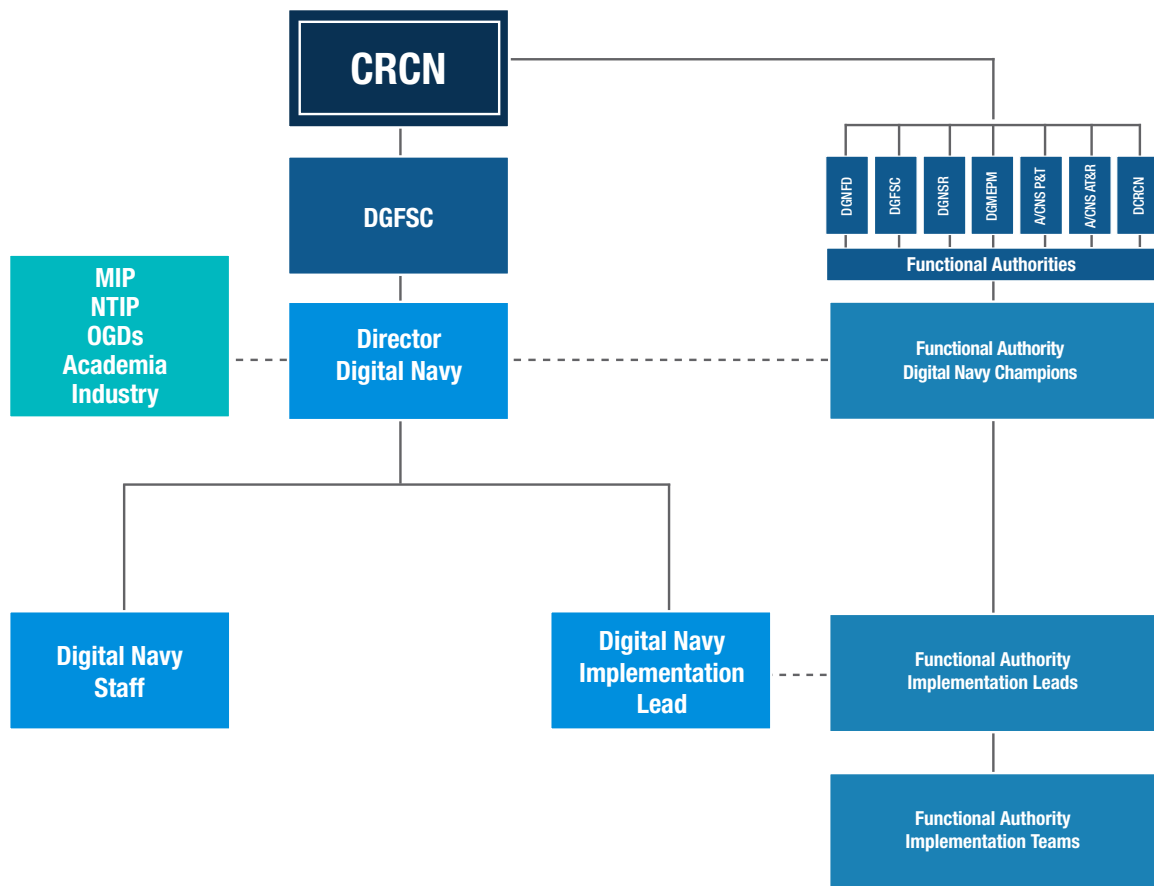


Figure 1 Digital Navy Information Flow

RETURNS AND REPORTS

Progress against the Digital Navy initiative will be reported through the RCN Quarterly Report. Director Digital Navy will work with designated Functional Authority Digital Navy Champions and Implementation Teams to generate the necessary performance metrics and content to include in the RCN Quarterly Report, beginning with the Q1 report for FY 20/21.

Digital Navy initiatives will be captured in a collaborative innovation platform that will be briefed to the Functional Authority Implementation Teams by the Digital Navy Office in Q4 FY 19/20. This platform will be used as a repository for all Digital Navy initiatives going forward.

FINANCES

Funding for Digital Navy-related initiatives will be provided via various channels. Functional Authorities are expected to prioritize identified initiatives within their functional lines on an annual basis and present funding requirements to the Digital Navy Office as part of normal business planning processes for consideration. Each FY the Digital Navy Office will allocate available RCN funds to the identified initiatives on a priority basis in order to advance the RCN's Digital Navy agenda.

It should be noted that most of the funding allocated to the Digital Navy initiative will be used to progress the exploration of existing technologies via small-scale pilot projects, as opposed to the implementation of an existing technology at scale across the fleet or enterprise. Funding for those technologies that are identified for implementation at scale after a successful pilot will be secured through existing procurement processes.

During the initial phases of implementation, the Digital Navy Office will establish contractual vehicles and facilitate workshops to further develop Use Cases of interest, while exposing naval team members to agile design and user-centred design methodologies that foster creative thinking and inspire new innovative concepts. It will also include expert-led seminars to help members of the naval team better understand how specific digital technologies can be leveraged within a naval setting.

APPROACH TO WORK PRIORITIZATION

Functional Authorities will be responsible for setting their own priorities to progress their Digital Navy-related initiatives. To assist with prioritization and ensure coherence of effort across functional lines, the DNO will work with Functional Authority Digital Navy Champions and Implementation Teams to provide guidance on those digital technologies that should be considered for exploration. This will be achieved through a combination of in-year engagements with Functional Authorities and through an annual Digital Navy Forum with stakeholders.

Digital innovation initiatives that Functional Authorities intend to pursue through the government-run innovation programs such as the Build in Canada Innovation Program and Innovative Solutions Canada will be vetted for comment by the Digital Navy Office before being submitted to the Maritime Innovation Program for disposition. This will be done to help facilitate coherence in the digital initiatives being pursued across the RCN.

¹The first iteration of the Digital Navy Action Plan includes a number of initiatives that are already in progress and supported by established funding streams. As the plan is put into execution, these initiatives will continue drawing on their established funding streams. Funding requests for new/unfunded initiatives will be submitted to the Digital Navy Office which will allocate available RCN funds on a priority basis.

DIGITAL NAVY INITIATIVES

Six strategic objectives have been established in the Digital Navy –“Enabling Canada’s Naval Team for the Digital Age” guidance document, all of which directly align with those objectives laid out in the RCN Strategic Plan 2017-2022. The six objectives along with their Functional Authority leads are as follows:

- Deliver a digitally-enabled future fleet (Director General of Naval Force Development (DGNFD));
- Increase the use of digital technologies to improve the delivery of materiel sustainability for the RCN (Director General of Maritime Equipment Program Management (DGMEPM) and Director General of Naval Strategic Readiness (DGNSR));
- Leverage digital technologies to attract and retain a motivated, technologically-oriented RCN workforce (DGNSR);
- Further exploit digital technologies to improve the delivery of individual training and military personnel readiness (Assistant Chief of Naval Staff Personnel & Training (A/CNS P&T));
- Increase the use of digital technologies to enhance the delivery of readiness and combat effectiveness (Assistance Chief of Naval Staff Afloat Training & Readiness (A/CNS AT&R)); and,
- Advance business management and communication practices through the innovative use of digital technologies (Director of Naval Strategic Management (DNSM)).

Details of the specific initiatives to be carried out under each of the six strategic objectives are described in the following paragraphs.

Use Cases have been provided in **Annex C** to support the understanding of how these initiatives can be used in a specific situation to deliver tangible benefits to the RCN Team.

DELIVER A DIGITALLY-ENABLED FUTURE FLEET (DGNFD AND DGFSC)

Director General Naval Force Development (DGNFD) is accountable for the strategic development of the next navy, including capability concepts, infrastructure and requirements from an operational, materiel support, and information management/technology perspective. DGNFD is also accountable for the RCN Capability Investment Plan coordination and directorship of naval acquisition projects. These responsibilities are being shared between DGNFD and Director General Future Ship Capability (DGFSC), with the latter being specifically accountable for Major Crown Projects, Naval Capability Introduction and Maritime Innovation. As such, this strategic objective is shared between DGFSC and DGNFD.

Key to the delivery of the future fleet is the progression of the Arctic and Offshore Patrol Vessel, Joint Supply Ship, and Canadian Surface Combatant major crown projects, all of which are now well underway. Ensuring delivery of a capable future fleet is also dependent on a number of other key projects including: Victoria Class Modernization; RCN Intelligence Surveillance Target Acquisition and Reconnaissance; Underwater Warfare Suite Upgrade; Light Weight Torpedo Upgrade; Naval Electronic Warfare System Sub-Surface; Multi-Role Boat; Naval Training System Transformation; and Naval Large Tug. Digital technologies will feature prominently in these projects, helping to ensure that our sailors receive the digital capabilities needed to maintain the RCN’s relevance in the years ahead. This will be the key to future success.

DESIRED IMPACT

A desired impact of this Digital Navy initiative is to ensure that opportunities to introduce state-of-the art digital technologies in the future fleet are maximized during the ongoing period of Fleet renewal. This implies the need to ensure that our requirements and change management processes are rendered agile enough to judiciously evaluate and adopt new advantage-conferring digital technologies during the design and build phases, while working within financial, cost and scope constraints. It also implies the need to ensure that robust, forward-looking obsolescence management capabilities are put in place so that the digital technologies delivered are relevant and supportable in-service.

This initiative will also seek to encourage the use of innovative digital technologies that allow for greater efficiencies during the design and build phases for future ships. We will also seek to collaborate with stakeholders to ensure that modern digital technologies such as the 3D digital models that are now frequently used in the design and build phases can be leveraged to positive effect in multiple areas during the in-service phase.

An equally important impact desired from RCN's digital evolution will be the delivery of secure wireless digital technologies that improve the connectivity that sailors have within their ships and with their friends and families ashore. In addition, prudent investments in other digital technologies that improve quality of life at sea while enabling sailors in all occupations to carry out their work on board more effectively and efficiently will be a very visible characteristic of the RCN's digital maturation. Such efforts to make life at sea more digitally-enabled will require a holistic approach that achieves efficiencies through integration of the various digital technologies as much as possible, while ensuring that the systems delivered have the required degree of availability, redundancy, interoperability and security.

INITIATIVES

Connected Ship

This initiative focuses on creating a wireless infrastructure within ships in order to improve the connectivity sailors have with their families and friends while deployed and also to support on-line training. In addition to Wi-Fi aboard RCN vessels, the availability of sufficient ship-to-shore communications bandwidth will also be explored.

3D Digital Models for Use in Non-Technical Domains

This initiative will explore the use of 3D digital models of ships that are predominantly used in design and build phases, for applicability in other functional domains such as training. This exploration will be conducted in consultation with affected stakeholders in ADM(Mat) and Commander Naval Personnel & Training Group (CNPTG).

Digital Thread Study

DGFSC will sponsor a Defence Advisory Board study aimed at exploring how the RCN could leverage emerging digital thread technology to better integrate and drive deeper through-life insights from the vast amounts data being generated by modern digital technologies that are being incorporated into the naval enterprise.

Technological Roadmap Development

During the early phases of implementation, DGFSC will, through Director Digital Navy, facilitate the development of digital technology roadmaps for each Functional Area by providing Functional Authority Implementation Teams access to look-ahead reports and workshops facilitated by subject matter experts.

Digital Maturity Baseline Assessment

The Digital Navy Office will conduct an initial digital maturity gap analysis of the RCN during the first year of implementation, consisting of surveys and executive interviews in each Functional Area. This assessment will highlight where the RCN needs to focus its efforts in order to become a more digitally mature organization.

Agile Requirements and Change Management Processes

Working with DGFSC and DGNFD staff, the Digital Navy Office will facilitate a review of our requirements and change management processes with a view to streamlining the speed at which the RCN is able to adopt innovative digital technologies during the design, build and in-service phases.

Development of an RCN App Portal (DDN)

The Digital Navy Office will continue to lead the development of an RCN App that will provide sailors remote access on their own devices to data and services that are currently only available behind the Defence Wide Area Network (DWAN) firewall. This effort will focus on evolving the current prototype of the RCN App to an initial production version by the end of FY 20/21.

Increase the Use of Digital Technologies to Improve the Delivery of Materiel Sustainability for the RCN (DGMEPM and DGNSR)

This strategic objective will be executed by Director General of Maritime Equipment Program Management (DGMEPM) and Director General Naval Strategic Readiness (DGNSR). Director of Naval Logistics (D Nav Log) will lead the initiatives pursued by DGNSR, while Director Naval Platform Systems (DNPS) will lead those pursued by DGMEPM. Initiatives requiring support from the other Functional Authority are highlighted in the text below.

Significant steps have been taken under the RCN's *Strategic Plan 2017-2022* to improve materiel readiness through improved and more integrated governance and through the ongoing introduction of innovative technologies. To build on this progress, a more concerted effort is needed to fully leverage the potential that digital technologies have to improve the delivery of materiel readiness of the RCN fleet. Moving forward on this intent will be particularly important to ensure the RCN positions itself for success as it prepares to introduce a significant number of new ships, while at the same time supporting an ageing legacy fleet.

In addition, the digital technologies also continue to revolutionize logistics delivery models and capabilities, from being a driver of marginal efficiency to an enabler of essential innovation and unequalled opportunity for value creation. The Digital Navy initiative will explore new sources of value across Logistics functional areas arising from latest developments and trends from industry digitization, while leveraging societal and cultural digital change.

DGMEPM DESIRED IMPACT

Large in-service support contracts for the maintenance of naval assets are now a common feature of the naval materiel enterprise landscape. Industry partners providing support through these contracts often do so in close collaboration with the Fleet Maintenance Facilities, Naval Training Systems and third-line maintenance organizations under hybrid support models that seek to improve the delivery of materiel readiness. In order to extract the full potential from these support arrangements, DGMEPM will, subject to available funding, continue to pursue ongoing efforts to put in place the digital technologies and processes to enable the seamless exchange of electronic data and information with industry partners.

Many of our current and all of our future naval platforms will have powerful Equipment Health Monitoring (EHM) systems capable of capturing vast amounts of equipment operating data. To make full use of this data and drive towards condition-based, as opposed to time-based maintenance regimes, we will progress efforts to investigate the potential to better leverage EHM data from our legacy platforms while facilitating the introduction of world-class EHM capabilities in our new platforms. These efforts will be orchestrated with a view to putting in place capabilities to enable rapid analysis of the EHM data by ship's staff and shore-based authorities to more proactively identify existing and impending failures.

While there are existing processes and tools that help generate an appreciation of the material state of naval platforms, more needs to be done to improve data accuracy and to expand the scope of the systems and platforms covered. To that end, DGMEPM will work with stakeholders to establish the governance and processes needed to enhance the quality and accuracy of materiel state data, ensuring alignment with the DND/CAF Data Strategy and associated amplifying direction.

Improving delivery of materiel sustainability requires that our uniformed technicians and FMF maintainers have the digital tools they need to get their important work done effectively and efficiently. Ruggedized portable smart devices, augmented reality technologies, and 3D printers are among the broad range of digital tools that offer real potential to empower maintainers of naval equipment. Working with stakeholders and the FMFs, Fleet, and Naval Training System, DGMEPM will lead efforts to explore the potential application of digitally-enabled tools to assist and empower our maintainers.

DGMEPM INITIATIVES

DGMEPM digital initiatives will be grouped into the following focus areas: Advanced Data Analytics, Navy Integrated Data Environment, and Digitally-Enabled Tools.

ADVANCED DATA ANALYTICS

Initiatives pursued in this focus area will leverage the latest digital technologies and data analytics capabilities to drive more informed decision-making related to material sustainability. Specific initiatives to be pursued are highlighted below.

- **Artificial Intelligence (AI) and Machine Learning.** Under the Naval Technical Innovation Program (NTIP), Director Naval Platform Systems (DNPS) will investigate the utilization of advanced data analytics with AI to increase the ability to de-risk naval maintenance schedules.
- **Advanced EHM techniques and predictive analytics.** Subject to available funding, DNPS will work with the Centre for Maintenance Reliability Engineering (CMORE) to investigate the use of advanced EHM techniques to generate predictive equipment maintenance recommendations from available Integrated Platform Management System (IPMS) data; Subject to available funding DNPS will also, through NETE, further develop ongoing efforts with NETE to further develop the HARVEST tool, which applies advanced data analytic techniques to facilitate proactive equipment maintenance recommendations.
- **Digital Twins.** Subject to available funding, DNPS will explore the application of Digital Twin technologies leveraging real-time or near real-time IPMS data to facilitate better understanding of the materiel state of naval equipment, all with a view to optimizing maintenance and platform availability. DNPS will also investigate the development of digital twin technologies in consort with our Classification Society partners to enable the efficient certification of naval platforms under the Naval Material Assurance Program.

NAVAL INTEGRATED DATA ENVIRONMENT

In order to facilitate optimal maintenance, repair and disposal of naval equipment and systems, Director Maritime Management and Support (Management Information Systems), will advance the ongoing development of a Naval Integrated Data Environment to enable real-time or near real-time exchange of electronic data between DND and industry partner information systems. In the near term, this effort will focus on progressing the development of an Electronic Data Exchange (EDE) capability under the AJISS contract.

DIGITALLY ENABLED TOOLS

To ensure that naval technicians, trainees, and civilian maintainers are equipped with the digital tools needed to do their important work effectively and efficiently, the following initiatives will be pursued:

- **Augmented Reality Technology:** Under the NTIP, DNPS will explore the use of augmented reality technologies to support and optimize maintenance within the fleet, liaising with Director Naval Personnel and Training (D Nav P&T) on training-related aspects of the initiative as required. The focus will be on determining how best to utilize the technology to provide heads-up and hands-free information to make maintenance routines easier to complete. The technology will also be explored with a view to augmenting training regimes, and access to subject matter experts via remote assistance. Initial trials will examine the use of data overlays to assist with compartment familiarization and presentation of pertinent maintenance and operational data.
- **Ruggedized tablets with high-level electronic technical manual capabilities:** Under the NTIP, DNPS will explore how the implementation of hardened tablets and other mobile devices for use within a naval environment might replace the use of paper-based documents such as training documents, maintenance manuals, operational manuals, test sheets, and trial reports. This will be done in collaboration with D Nav P&T for training-related aspects and in collaboration with ADM(IM) staff for IT/IM infrastructure-related aspects.
- **Additive Manufacturing (or 3D Printing):** DNPS, in conjunction with the FMFs and Commander Naval Personnel & Training Group (CNPTG), will continue to progress the implementation of Additive Manufacturing (AM) technologies within the RCN to optimize spare parts availability ashore and at sea. This initiative will include the development of associated direction and guidance, and identification of related training requirements. It will also include further collaboration with other elements and research staff to explore the utilization of metal AM processes and the associated quality assurance required to support introduction of these parts into service.

- **Web-based Collaborative Tools:** Under the NTIP, DNPS will continue to progress the utilization of collaborative, web-based tools and software to facilitate communication and ideation amongst the many stakeholders involved with naval technical innovation. As well, DNPS will investigate the utilization of software tools to facilitate asynchronous digital design and engineering reviews over a wide geographic area with a view to improving efficiency over current methodologies (paper, email, SharePoint).

DGNSR DESIRED IMPACT

Technologies, education and training, along with industry best practices and standards for strategic alignment provide the essential building blocks for the digital transformation of the RCN Logistics system. The RCN Logistics systems are fully integrated with departmental Supply Chain ERPs and must remain so in order to effectively leverage that Supply Chain architecture. The adoption of modern technology encourages transparency and real-time situational awareness, facilitating increased efficiency and effectiveness within each respective Logistics functional system. DNPS will work toward the stabilization and digitization of Naval Materiel Management processes to generate a usable and clean materiel dataset. Through advanced analytics and eventually AI, the materiel dataset in its entirety will be utilized to fully realize data driven decision making regarding materiel state. This initiative aims to further dissolve the current data organizational silos, and as such, enable and merge materiel data generated from key stakeholders on the coasts and in the NCR. Digitizing and leveraging NMA processes outputs will improve our ability to assure that naval materiel is appropriate for use in-service and meets performance, safety and environmental requirements allowing for better risk informed assessments for ship operations outside of the operating envelope derived from the Design Intent.

In order to improve the delivery of Logistics readiness and sustainability to the RCN, this initiative aims to accomplish the following:

- to optimize RCN Supply Chain technologies alongside new departmental Supply Chain technologies to achieve enriched materiel accuracy, delivery and readiness; and
- to facilitate the adoption of modernized digital platforms, innovative service models and new digital capabilities to improve the efficiency and delivery of Logistics Support Services (administration, contracting, accommodations, food services, finance, transportation and ammunition).

The combined results will facilitate a more agile and responsive Logistics system of system to enable effective delivery of the future fleet and optimal service to its sailors.

DGNSR INITIATIVES

DGNSR digital initiatives in support of the materiel sustainability objective will be overseen by D Nav Log and will be grouped into the following focus areas: Data Integration & Analytics, Service Delivery, and Logistics Enterprise Management.

Data integration and analytics (Naval Logistics Analytics Program)

D Nav Log will progress the *Naval Logistics Analytics Program* to improve the management and analysis of logistics data sets in order to better identify and address the root causes of impediments to the flow of naval materiel.

Service Delivery

- **Accommodations Booking System:** D Nav Log will support the roll-out of the Roommaster Digital booking system, which is intended to increase accommodation usage and allow for better analysis of accommodations requirements related to training and operations.
- **Warehouse Operations:** D Nav Log will spearhead efforts to improve warehouse operations through the adoption of enhanced workplace organization methodologies (e.g. the 5S model) and new smart warehousing equipment such as Vertical Lift Storage systems.

LOGISTICS ENTERPRISE MANAGEMENT

In order to enhance the management of the naval logistics enterprise, D Nav Log will support and synchronize efforts with the following digital departmental initiatives:

- **Modernization and Integration of Sustainment and Logistics (MISL)** – This departmental initiative seeks to enhance materiel visibility across the Supply Chain by achieving national-level integration of current stand-alone ERPs for transportation and ammunition into the SAP environment, and by adopting the Enhanced Warehousing Module. D Nav Log plays a supporting role to this project.
- **Materiel Identification (MI)** – This departmental project has been established to clean and standardize DND’s materiel records to enable better Supply Chain execution. D Nav Log plays a supporting role to this project.
- **E-Procurement** – This is a PSPC led initiative to adopt the SAP Ariba tool for the procurement of goods and services across government and will see changes in the way that DND procures goods and services. D Nav Log plays a supporting role to this initiative.
- **Defence Resource Business Modernization (DRBM)** – This is a new DND initiative to migrate from SAP ECC to S/4 HANA. D Nav Log plays a supporting role.
- **Automatic Identification Technology (AIT)** – This is a departmental initiative aimed at adopting barcoding and RFID technology and associated software across the Supply Chain to improve data quality and allow for both increased effectiveness and efficiency. D Nav Log plays a supporting role.
- **ERP User Experience (UX)** – This is a departmental initiative to adopt the SAP Fiori UX software to allow for better DRMIS user experience. D Nav Log plays a supporting role.

Leverage Digital Technologies to Attract and Retain a Motivated, Technologically-Oriented RCN Workforce (DGNSR)

This strategic objective is assigned to the DGNSR. It focuses on leveraging digital technologies to enhance the strategic management and support of the entire naval team comprising Regular and Reserve Force sailors, our civilian workforce and their families. It is intended to help address the unique challenges and opportunities that the RCN is facing in order to ensure that every member of the RCN Team is provided with a challenging, rewarding career whilst improving work-life balance.

It should be noted that under the RCN Strategic Human Resources Plan 2018-2023, the Navy is pursuing a Human Resources (HR) digital business transformation process that includes four lines of effort to better execute HR management today and tomorrow:

1. data collection and integration;
2. data analytics;
3. modelling and simulation; and,
4. HR business technology introduction.

The Digital Navy initiative will support and complement these ongoing efforts, while working to ensure coherence with digital initiatives being pursued across the RCN.

DESIRED IMPACT

This initiative will improve the reliability and accuracy of HR data and analytical tools needed to accurately report on, and make informed decisions about, the workforce. This data includes both establishment (positions) and people and must cover all situations/statuses that currently exist within our workforce. To ensure a coherent approach, DGNSR will, through D Nav P&T, work with stakeholders to align HR data-related efforts with existing strategies, including the DND/CAF Data Strategy and the RCN Data Strategy, all with a view to permitting more proactive workforce management in a changing strategic HR landscape.

DGNSR requires integrated tools linking HR databases and data sources to optimize efforts to improve HR data quality and analytics capabilities. More of these integrated tools linking HR databases and data sources will be

required. D Nav P&T will pursue this by enabling the RCN to track individuals from enrolment to release, as well as better align the RCN organization and establishment with occupational structures based on accurate, data-driven decisions. The desired impact to be achieved through these efforts will be for an RCN better positioned to manage its personnel, rapidly adjust to changing priorities, and ensure success on operations.

This initiative will have a third impact, which is to ensure the RCN sailors of tomorrow are equipped with the right skills and experience to thrive in the digital age. This implies the need to proactively identify those digital skill sets that will be needed to ensure mission success in the future. The rapidly evolving nature of the digital landscape requires a more deliberate approach to this challenge, one that makes use of collaborative networks in and outside of government. D Nav P&T will champion efforts pursued in support of this desired impact.

A fourth impact to be delivered through this initiative is to enhance efforts to increase recruitment and retention of sailors by providing them better access to digital tools and platforms that serve to improve quality of life and overall job satisfaction. Efforts geared toward this end will be spearheaded by Director Naval Information Warfare (DNIW), who will pursue the delivery of cloud-based platforms to enhance user experiences.

INITIATIVES

- **One Navy Vision** (D Nav P&T supported by DNSM)

Leverage technology that delivers to our three unique workforces the ability to operate in a single digital environment that eases access to, and sharing of, policies and plans affecting the RCN Team. Examples of these technologies would allow seamless personnel transition from any place of work within the Navy to another and will simplify component transfers.

- **Digital Skills Set Review** (D Nav P&T)

D Nav P&T will support the DPGR-led Occupational Analysis in order to ensure that naval occupations will be ready with the skills required for the current and future fleet. This review will identify those digital skillsets that will allow our members to be prepared for and to thrive within the rapidly evolving digital landscape.

- **Roll-out of the Cloud-Based Office 365** (DNIW)

The roll-out of the cloud-based Office 365 package will be progressed, which will provide the RCN Team a convenient, remote and secure access to a range of useful software tools.

FURTHER EXPLOIT DIGITAL TECHNOLOGIES TO IMPROVE THE DELIVERY OF INDIVIDUAL TRAINING AND MILITARY PERSONNEL READINESS (A/CNS P&T)

This strategic objective is assigned to Comd MARPAC, as Assistant Chief of Naval Staff, Personnel and Training (A/CNS P&T). Reporting to A/CNS P&T, CNPTG is the delegated Training Authority responsible for all Individual Training and Education for the RCN. The Naval Personnel & Training Group (NPTG) divides its role into four primary training activities: Training Management, Training Development, Training Delivery and Personnel Management. CNPTG, in addition to delivering Collective Training (CT) levels 1 and 2, is also responsible for the development, operation, sustainment, and management of technology used in CT that does not directly involve the employment of ships or other operational assets.

It should be noted that the Naval Training System Transformation (NTST) initiative is well underway and includes elements to leverage digital technology to optimize and modernize the training system. This transformation initiative will deliver a technology-enabled training system rooted in naval heritage and ethos that employs learning tools and information management systems sharing information across numerous platforms. This Digital Navy initiative will directly support and complement these ongoing efforts, while helping to ensure coherence with digital initiatives being pursued across the RCN.

DESIRED IMPACT

Over the next decade, the Naval Training System (NTS) will be required to integrate the training capability elements of seven diverse Platforms and several projects in the RCN capital programme, modernise legacy training to a common standard, and integrate modern business intelligence as well as modelling and simulation tools from broader DND corporate initiatives. This represents a significant but necessary challenge, which must be met to better integrate and synchronize Individual Training (IT) and Collective Training CT capabilities and their evolving doctrines. An important desired impact from this Digital Navy initiative is to support and facilitate this integration effort to ensure more effective execution of the training management, development and delivery functions with the agility to respond to changing doctrine and government priorities.

Recruits joining the RCN today are graduates of education and training institutions that employ modern learning methods and digital technologies. As digital natives reliant on ubiquitous connectivity, they join the RCN with the expectation that naval training will be at least as technology-enabled as training they have received in their civilian lives. With that context in mind, a key desired impact of this initiative is for the Naval Training system to meet sailors' expectations by proactively identifying, embracing and leveraging modern digital technologies that enable world-class training experiences and outcomes.

INITIATIVES

Future Naval Training System (FNTS) and Naval Training System Transformation Program (NTST)

The FNTS 2015 Strategy (2015), the NTST Program Plan (2019), as well as the NTST Program Charter (2019), describe the digital context within which the FNTS will exist. To this end, the NTST Program will ensure that the FNTS operates within a robust and supported NTS Digital Framework. The framework will have supporting tools and processes implemented accordingly. The implementation of a responsive and dynamic digital environment requires the use of modern, integrated educational technologies, effective content development and corresponding methodologies to effect change. For the RCN, relying on a single toolset or system along with inconsistency in approach to standards and methodologies is no longer sufficient to deliver quality content to students in class, away from a unit, or while deployed. An integrated approach leveraging technologies such as a cloud-based Learning Management System (LMS), Learning Records Store (LRS), Learning Object Repository (LOR), online collaborative spaces and critical media development and management tools are key. The RCN will employ digital components in all phases of training, including the management and delivery of material to students in all forms because content delivered to classes, groups or individuals is best managed within the model. Therefore, the NTST Program, with additional support from NPTG Head Quarters (HQ) Future Plans will develop a viable NTS Digital Framework.

NTS Digital Framework: Cloud-Based

The NTS will immediately seek to adopt cloud-based digital capabilities that align with Government of Canada and Department of National Defence cloud strategies. The RCN will exploit advantages gained from cloud-based tool sets, resulting in increased accessibility and business model integration to fully realize advantages of distributed learning. The NTS will exploit opportunities to shift expenses from capital acquisition of hardware and software to recurring operational expenses to support cloud-based systems, tools and resource development.

NTS Digital Framework: Supporting DL Components: LMS, LRS, LOR

Cloud-based Learning Management System (LMS), Learning Records Store (LRS), Learning Object Repository (LOR), are critical components that enable the NTS to operate in an integrated and interoperable digitalized environment. Specifically, the NTS will pilot the Distributed Learning Network 3.0 (DLN 3.0) to explore its LMS and social collaboration capabilities, while looking for ways to best integrate a robust LRS and LOR within a cloud environment. These components of the distributed learning system ensure that training management, development and delivery are coherent and will ultimately support IT and CT delivered in a variety of settings, including ashore training sites, in shore units such as FMF, or afloat while deployed.

NTS Digital Framework: Supporting Integration of Management Components: Military Command Software (MCS) and Materiel Management Systems

The FNTS requires seamless integration of data regarding both personnel and materiel to realize efficiencies from delivering training through to the maintenance and manning of platforms. Effective and efficient training management is supported by accurate data. Therefore, the training system will fully employ MCS and support the integration of data between current and future enterprise systems to leverage a more complete data set for strategic and tactical analysis. Remaining technologically in step with evolutions in these systems is critical to success.

Training must also deliver on performance objectives that enable operators and maintainers to be job-ready once qualified. This occurs when there is zero tolerance for discrepancy between training and operational materiel in form, fit and function, whether real or simulated.

The development of a Naval Warfare Officer (NWO) Logbook is a recent concept that illustrates the potential of integration between training, operational, personnel and materiel contexts and will be a key initiative for the NTS. This log will likely be based on an interface with MCS and will require two-way data transference between enterprise personnel systems to record task performance and successful completion. Ultimately, it must also be verifiable against operational data confirming platform, time and activities reported. The NWO Logbook is a key deliverable and evidence of the success of an integrated NTS Digital model.

NTS Digital Model: End-User Technology Enabled Learning (TEL) Media

Full use of the spectrum of Technology Enabled Learning, aligned with effective and dynamic delivery, is a cornerstone of the FNTS. To this end, the NTS will continue to focus on developing responsive, scalable and appropriate TEL to ensure transference to practical applications and realize the greatest learning outcomes. These TEL deliverables will be provided through the System of Training and Operational Modernization (STORM) project, as well as through NTST-developed major and minor capital projects in the future. Current TEL initiatives include but are not limited to:

- Multi-purpose reconfigurable trainers (MRTs). The development of a common software architecture that will form the basis of MRT systems. This Common, Open, Reconfigurable Environment (CORE) architecture is the initial spiral of MRT development and will create a set of common, modular components using open standards that will increase commonality across trainers. The development will include the creation of an initial MRT to address crane training. This work will set the stage for the development of future naval training systems that will reduce reliance on single-use custom systems - creating training spaces that can be reconfigured depending on the class of ship and course being taught in the space.
- Virtual reality (VR) training capabilities for AOPS diesel systems. This pilot will provide opportunity for action-based research to compare the assessment of learning objectives delivered by VR against existing delivery methodologies.
- Evolving existing Maintenance Procedure Trainer (MPT) capabilities. This will allow for a variety of implementation models including, but not limited to, mobile devices such as tablets. This work will broaden application, increase effectiveness, provide for enhanced assessment, and provide for greater training capabilities within the NRDs. Mobilizing MPT delivery will also free up currently dedicated classroom environments allowing for greater flexibility in the usage of Technology-Enabled Training Classrooms.
- Evolution of existing 3D replenishment-at-sea (RAS) training capabilities aligned to JSS. Advance existing 3D RAS liquids and solids transfer task trainers beyond platform specific implementation towards future requirements.
- Development of iOS and Android apps to support access to unclassified training both on the CAF-provided DWAN and personally owned Internet-based devices. Content will include interactive animations and exploded parts views of items such as engines, which can be manipulated by the trainee. This will supplement current training, provide on-task support, and serve as a refresher for CAF personnel.

- Advancement of the cloud-based DLN 3.0 as a viable and robust delivery platform with greater bandwidth and functionality to successfully serve a variety of TEL opportunities for learners.

Increase the Use of Digital Technologies to Enhance the Delivery of Readiness and Combat Effectiveness (A/CNS AT&R)

In accordance with the RCN Strategic Plan 2017-2022, Commander MARLANT, as Assistant Chief Naval Staff Afloat Training and Readiness (A/CNS AT&R), is responsible for the sustainable delivery of responsive, agile and combat-effective naval forces for Canada. Within the context of the Digital Navy initiative, A/CNS AT&R will undertake initiatives to enhance the use of digital technologies in direct support of this overarching strategic objective.

The RCN's ability to produce combat-effective naval forces in a rapidly-evolving technological environment is directly related to its capacity to deftly integrate new digital technologies into the day-to-day operating environment of the fleet. To do so effectively, a holistic approach that takes into account materiel, personnel and training-related considerations must be pursued in the production and management of naval readiness.

DESIRED IMPACT

The desired impact of this strategic objective is for A/CNS AT&R to augment the use of modern digital technologies to generate naval forces that are not only ready and combat-effective when faced with the threats of today, but adaptive and agile in response to the threats of tomorrow. To that end, A/CNS AT&R will execute this initiative focusing on three broad desired areas of impact: schedule management, collective training, and quality of life.

Through DNFR, A/CNS AT&R will continue ongoing work aimed at employing digital technologies to enhance the management and scheduling of the many different resources that contribute to readiness and mission success. Related efforts will build upon the recent success of the One Fleet Schedule, which now enables data-driven analytic reports and integrated digital tools to more rapidly and accurately assess costs associated with scheduled activities.

Through the Sea Training Group (STG), A/CNS AT&R will use this initiative to further leverage digital technologies to improve the delivery of Collective Training (CT) for ships' companies. Initiatives with this desired impact in mind will be designed to improve the achievement of readiness targets, while increasing flexibility by reducing reliance on sea days as the primary means to deliver combat training.

Through the respective Formation Chief Petty Officers, A/CNS AT&R will continue with efforts to improve quality of life and job satisfaction, building on recent initiatives that have provided members of the naval team easier access to sought-after information and streamlined previously time-consuming, paper-based administrative processes. Future activity in this people-centric focus area will seek to ensure that new functionality is, where practicable, accessible on mobile-devices to improve convenience for the sailors and civilian members of the RCN. An example of this is the digitization of the in-routine process, leveraging technology to increase the efficiency of our staff effort and removing the requirement for a physical presence throughout the process.

INITIATIVES

Scheduling Optimization

Scheduling Optimization is an ongoing initiative under the RCN Strategic Plan 2017-2022, which seeks to integrate operations and maintenance schedules into a single pan-RCN schedule, enabling the seamless integration of critical fleet data into the business planning process. Under the Digital Navy initiative, this ongoing effort being led by DNFR will continue to advance our capacity for leveraging advanced data analytic capabilities such as predictive analytics and Machine Learning to further enable schedule optimization by facilitating more informed, timely decisions. Through DNFR, the One Fleet Schedule (IFS) tool has successfully consolidated many scheduling inputs highlighted in the RCN Strategic Plan 2017-2022. Future development will strive to leverage this consolidated scheduling data to support a real-time impact assessment of schedule changes at the multi-year / macro level.

Analytical Tools Suite

DNFR and STG supported by the Command Analytics Support Centre will continue developing a suite of analytical tools to provide improved access to timely, objective data from which to make optimization decisions on the delivery of readiness and combat effectiveness. One such analytical tool leverages the digitization of the RCN incident reporting process by creating an RCN Incident Reporting App capable of providing valuable real-time data consolidation.

Collective Training Modernization

The modernization of collective training is being pursued by STG under the RCN Strategic Plan 2017-2022. This initiative includes efforts to increase the use of synthetic training environments as a means to enhance the delivery of ready, combat-capable naval forces. The Digital Navy initiative will contribute to this ongoing initiative by pursuing the ability to connect HMC ships, shore trainers, RCAF and CA simulators, and Allied partner assets into real-time synthetic training environments to enable multi-ship synthetic training without the need to radiate RF energy.

User Centred Digital Services

To improve quality of life and job satisfaction, Formation Chief Petty Officers will continue with ongoing efforts to develop and deliver user-centred digital services to members of the naval team. This includes building on the recent development of an interactive digital map providing real-time information on ship berthing locations, parking restrictions and shuttle schedules. It will also include efforts to further streamline the in/out routine in MARLANT with the assistance of digital technologies. Under the Digital Navy initiative, Formation Chief Petty Officers will continue with these and related initiatives, focusing on enhancing user experiences by making selected digital services accessible on personal mobile devices.

Advance Business Management and Communication Practices Through the Innovative Use of Digital Technologies (DNSM)

This strategic objective is assigned to the Deputy Commander of the RCN (DComd RCN) and will be executed through the Director Naval Strategic Management (DNSM). It focuses on enhancing data quality and maximizing the use of digital technologies to enable evidence-based decision-making at all levels of the organization. It also aims to improve strategic communications with the assistance of digital technology.

Since 2013, the RCN has applied significant effort under its Command Analytics initiative to develop meaningful analytics content to support decision-makers and information consumers across the naval enterprise. The Digital Navy initiative is intended to help build upon these early efforts by actively supporting ongoing data analytics efforts and the operationalization of the DND/CAF Data Strategy within RCN lines.

DESIRED IMPACT

An important desired impact to be facilitated through this initiative is the development of robust data capture capabilities that enable truly informed decision-making. To that end, the RCN will work to establish a robust data architecture enabled by enterprise level data management tools to ensure ready access to high quality data for all facets of the organization. The RCN will also continue work aimed at increasing, and where possible automating, data collection and analysis to enhance data quality while reducing time spent manually inputting and manipulating data.

Access to powerful data analytics capabilities is required to leverage ongoing efforts to improve the quality of the steadily increasing amounts of data available to users across the naval enterprise. To assist in that effort, the RCN will expand its analytics capabilities to include semi-structured data, including pictures, as well as text and sentiment analysis. Artificial Intelligence and Machine Learning, underwritten by policy guidance, will also be leveraged to enable all elements of the naval enterprise to make better use of data. Expanded use of cloud-based services will underpin much of this functionality, providing sailors access to useful services and data anywhere from any device.

Under this initiative, the RCN will bolster its use of modern digital technologies to better deliver its strategic messaging to internal and external audiences. Increased use of social media will underpin this effort as will the expanded use of cloud-based services that together will provide members of the naval team more ready access to useful services and data anywhere from any device.

INITIATIVES

DNSM-led digital initiatives under this action plan will be grouped into the following areas of focus: Digital Business Transformation, Data Architecture, Artificial Intelligence and Machine Learning, Cloud-Based Services and Digital Solutions.

Digital Business Transformation

- *Data Quality Management Program.* DNSM will implement a Data Quality Management program in support of the department's data strategy, which will include technical components utilizing data cleansing software (SAP Data Steward) and Master Data Governance (SAP MDG). The program will also include process, governance and cultural change elements that will enable the RCN to provide Data Quality Management as services.
- *Single Integrated Platform.* DNSM will, with the support of D Nav P&T, pursue the development of a capability that integrates data, data sources and analytical tools into a single platform. This initiative will include the collection and validation of HR data existing on a number of disparate platforms and databases. It will leverage ongoing work by various L1 stakeholders to enhance data quality and consolidate efforts to generate accurate, strategically beneficial HR reports. as service.

Data Architecture

- *Data Model a frigate.* DNSM will pursue the development of a holistic data model for a Halifax-class frigate that includes technical and non-technical data sources. This will complement ongoing efforts to create a digital ship, with a view to simplifying and automating routine reporting requirements for ships. The test ship will likely be from the West Coast, but we are waiting to confirm with Canadian Fleet Pacific availability.

Artificial Intelligence and Machine Learning

- *Predictive Analytics Capability.* DNSM will in collaboration with DGMEPM/D Nav P&T/DRDC pursue the development of an RCN predictive analytics capability to support data science as a service. Initial pilots will focus on establishing a predictive maintenance capability and improving High Priority Request (HPR) delivery and personnel forecasting.

Cloud-Based Services

- *RCN Data Lake.* In support of ongoing efforts to expand the use of cloud-based services, DNSM will lead the implementation of a cloud-based data integration platform, the RCN data lake. This will be done in conjunction with the Joint Defence Cloud Program (JDCP) and affected stakeholders, with the goal of bolstering the RCN's ability to make use of its data and data analytic capabilities.
- *Open Data Portal.* DNSM will lead the implementation of an open data portal to support engagements and collaborations with academia and industry. This is in line with open data by default as a government and departmental priority.

Digital Solutions – Business Transformation

The RCN digital solutions team aims to modernize and digitize suitable business practices to facilitate the implementation of the *RCN Strategic Plan 2017-2022*. Some of these initiatives include:

- Implementing an application portal for access through the internet to the DWAN to enable the utility of public facing applications that required DWAN information, such as recruiting, Reserve support and the RCN application;

- Developing an integrated waterfront management solution that allows sailors, yard workers and contractors to visually understand all dockyard activities in order to reduce work site resource conflicts and to optimize the delivery of maintenance for current and future warships;
- Automateing the RCN quarterly report to provide Functional Authorities and their teams more time to reflect upon the information contained in the report rather than focus on report generation;
- Introducing the first departmental RPA (Robotic Process Automation) bot to support the input of data from CFTPO to HRMS to ensure our sailors receive the right pay and allowances. This project is being done in conjunction with CJOC to expedite the processing of over 8,500 (and growing) outstanding files;
- Implementing Business Planning and Consolidation Software in support of automated business planning for the RCN;
- Advancing the development of an RFID solution to simplify peg-in/peg-out, bunking, watch and station bill allocation, and recall of ship's company; and,
- Developing HR, supply chain, maintenance and training analytics reports to provide decision-makers useful insights that support informed, evidence-based decision making.

REFERENCES

Canada. Department of National Defence. Strong Secure Engaged: Canada's Defence Policy 2017

Canada. Department of National Defence. Digital Navy: Enabling Canada's Naval Team for the Digital Age 2020

Canada. Department of National Defence. Royal Canadian Navy Strategic Human Resources Plan 2018-2023

Canada. Department of National Defence. Future Naval Training System Strategy 2015

Canada. Department of National Defence. Royal Canadian Navy Strategic Plan 2017-2022

Canada. Government of Canada Cloud Adoption Strategy 2018 Update

Canada. Department of National Defence and Canadian Armed Forces Data Strategy 2019

Canada. Department of Defence and Canadian Armed Forces IT Security Standard for Cloud Computing 2019

ANNEX A

TERMS OF REFERENCE

A-1 Terms of Reference - Digital Navy Champion

Each RCN Functional Authority will appoint a Champion at the Capt(N) or equivalent level to oversee the execution of the Digital Navy objectives within their respective area of responsibility and accountability. Champion duties will include the following:

- Advise Functional Authority on progress and measures to facilitate successful execution;
- Communicate and advocate for Digital Navy objectives and initiatives;
- Engage with industry, academia and other stakeholders to further Digital Navy objectives;
- Encourage and help foster a more experimental, agile and risk-tolerant innovative culture;
- Recommend composition and facilitate stand-up of their Functional Authority Implementation Team;
- Oversee and provide direction/guidance to their Functional Authority Implementation Team;
- Liaise with Director Digital Navy and other Champions to facilitate synergies across functional lines and mitigate impediments to progress;
- Participate in annual Digital Navy Forum and quarterly Champions meetings;
- Recommend specific initiatives to be progressed in order to further Digital Navy objectives;
- Brief RCN governance bodies on progress within Functional Area, as required; and,
- Assist with the development of Digital Navy inject to RCN Quarterly Report.

A-2 Terms of Reference – Functional Authority Implementation Lead

Each RCN Functional Authority will appoint a local Implementation Lead at the Cdr or equivalent civilian level to manage the execution of the Digital Navy objectives within their respective area of responsibility and accountability. Implementation Leads will report to their respective Digital Navy Champions and will be supported by a local Implementation Team whose composition will be at the discretion of the respective Functional Authority. Implementation Lead responsibilities will include the following:

- Advise Digital Navy Champion on progress made against stated objectives and impediments to successful execution;
- Recommend composition and direct stand-up of Functional Authority Implementation Team;
- Direct and coordinate activities of Functional Authority Digital Navy Implementation Team;
- Collaborate with Digital Navy Implementation Lead to drive coherency of effort and facilitate communications;
- Provide briefings to local stakeholders to enhance awareness of the Digital Navy objectives and initiatives being progressed within the Functional Area;
- Work with local stakeholders to identify future digital initiatives to be pursued in support of stated objectives;
- Participate in the annual Digital Navy Forum and monthly synchronization meetings arranged by the Digital Navy Office; and,
- Work with the Digital Navy Office staff to identify and provide performance metrics and other information for reporting requirements of the Digital Navy initiative.

ANNEX B

MANDATE – DIGITAL NAVY OFFICE

In order to ensure the successful execution of the RCN's digital journey, a Digital Navy Office will be established to facilitate the implementation and evolution of this initiative. The mandate of the Digital Navy office will include the following core elements:

Program Alignment. The Digital Navy Office will perform a coordination function to optimize synergies and collaboration amongst the stakeholders in order to bring coherence to the overall program. This will be achieved through close collaboration and sustained communication with the Functional Authority Digital Navy Champions and their supporting teams, Government of Canada stakeholders, and partners in industry and academia. To assist in this endeavour, Director Digital Navy will establish a collaborative ecosystem that will enable the necessary flow of ideas and coordination of effort. A component of this ecosystem will include a Digital Navy Forum that will draw key stakeholders together on an annual basis to exchange information and ideas that will be used to inform next steps on the RCN's digital journey.

Communications. The Digital Navy Office will play a central role in ensuring that this digital initiative is well communicated to members of the naval team, Government of Canada stakeholders, and partners in industry and academia. This will include sharing stakeholders' best practices and expert advice to facilitate the RCN's digital maturation. To assist with Communications, Director Digital Navy will develop and implement a communication plan, making full use of available venues and communications methods. A collaboration innovation platform will be included in the communications methods selected.

Performance Measurement. RCN Functional Authorities will be responsible for implementing and reporting on the strategic objectives assigned to them in this initiative. To assist with this effort, Director Digital Navy will work with Digital Navy Champions to develop a performance measuring framework and associated metrics. Progress will be reported through the RCN Quarterly Report and via briefs to that will be provided to Navy Governance on an as required basis.

Look-Ahead Function. Director Digital Navy will put in place mechanisms to ensure the RCN has a continuous, forward-looking capability to identify new and emerging digital technologies that have the potential to be most impactful to the Navy in the future. This information will be used to guide decisions on which digital technologies the RCN will choose to examine under this initiative.

Process Enhancement. Director Digital Navy will pursue efforts to enhance and, where necessary, develop processes to enable the RCN to more deftly identify, assess and implement innovative digital technologies. This will be critical to future success because many of the existing processes are not agile enough to keep pace with rapidly evolving digital technologies. As many of the applicable processes lie outside of RCN lines, these efforts will require sustained engagement with stakeholders in and outside of the department.

Training. Working with the applicable training authorities, the Digital Navy Office will undertake efforts to provide training opportunities for members of the naval team aimed at increasing awareness of digital technologies and methodologies that will be used to examine them. These opportunities will be delivered through various means, including in-class and on-line coursing, workshops and seminars.

Contract Vehicles. The Digital Navy Office will establish centrally managed contract vehicles to provide access to needed expertise and skill sets in the digital domain. Functional Authorities wishing to put in place contract vehicles to support their digital initiatives should first check with the Digital Navy Office to confirm if a centrally managed contract can be leveraged. In most cases, Functional Authorities wishing to access centrally managed contracts will be required to provide funding for the tasks undertaken.

ANNEX C USE CASES

C-1 NAVAL TRAINING SYSTEMS OF TOMORROW

Acting Leading Seaman (LS) Shamas

It has been two-and-a-half months since Acting LS Shamas started the rank qualification (RQ) LS Marine Engineering Technician course. Since the beginning of the course, her learning has been challenging and was completed using a blend of multi-role reconfigurable trainers, cloud-based distance learning networks modules, training in the 3D Maintenance Procedures Training (3D MPT), and finally, working in the hands-on machinery shop. She has thoroughly enjoyed the training and is about to embark on putting that training to use.

With her partner, Able Seaman (AB) Sanchez, the two trainees will use the Virtual Reality (VR) training room to conduct the diesel generator routine maintenance procedures they had just reviewed last week on the MPT. Putting on wireless VR headset and gloves, they enter the specialized classroom, essentially what appears to be an empty room with a grid on the floor and several sensors located on the walls. Upon entering the room, the software activates, and she finds herself in a fully immersed environment, with sights and sounds that emulate the AER of a Canadian CSC. Looking to her right she can see the avatar of AB Sanchez, as both move towards the diesel generator that requires their attention.

LS Black

LS Black, a Weapons Engineer Technician trainee, has recently been posted from HMCS Vancouver to HMCS Max Bernays. She needs to do a modularized bridging course to learn about the 25mm gun and other Harry DeWolf-class (HDW) combat systems. Since she's already RQ qualified, all she needs is the related modular lessons and 3D MPT sessions, before proceeding to the ship. She will also need to get used to the tablet-based technical publications she will be using on board.

She's already conducted her online self-paced pre-learning package, which taught her the basic facts, so when she arrives at her first class at Campus Pacific, she is directed to the shared classroom spaces, where the 3D MPT modules she has to complete will be accessed. Although she will be conducting most of the 3D MPT modules herself, the classroom is full of other students taking bridging courses, so that they can have direct access to Petty Officer First Class (PO1) Gonzalez, the Navy's HDW Class Combat Systems subject matter expert. PO1 Gonzalez is more of a coach and a guide for learning, assisting trainees in their studies.

From day one, LS Black has the tablet-based mobile technical publications (tech pubs) beside her on the desk, as she experiences various problem-based learning practical tasks on the 3D MPT. The MPT modules take about one week to complete, at which time she conducts a practical performance check on a 3D model before proceeding to her ship. When she arrives on ship, she uses the very same tablet tech pubs she used in the school to affect repairs. Because she used the same equipment in the school house, and had so much practice on the MPT models, there is no transition period for her before she gets to work. In other words, she is qualified on day one on board, with no lead-in time.

A/SLT Hamelin

A/SLt Hamelin, a member of HMCS Radisson, reported tonight to his unit for the weekly parade night. Before he completed basic military officer qualification (BMOQ) last year, he became accustomed to the weekly regime of blended online Defence Learning Network (DLN) sessions and classroom/live instruction, supported by local subject matter experts. After graduation from BMOQ, he was one of the lucky ones selected to carry on with Naval Warfare Officer (NWO) II last summer, and his weekly training session took a new and exciting turn.

For the last few months, he has joined a small group of trainees who are preparing for NWO III and NWO IV. Like the rest of his classmates, he is training diligently to learn the basics of navigation. Of course, there was some DLN training material they needed to go through, but the more exciting part was the use of the Advanced Naval Part Task Trainer, which provided him training that simulated the bridge environment using high definition visuals and realistic shiphandling.

Even better, shortly after he arrived at the unit tonight, Chief Petty Officer Second Class (CPO2) Gingras, the Unit Training Chief, had a surprise for him. His request to carry on with a Class B contract on completion of NWO IV had been approved, and he was going to join the crew of HMCS *Charlottetown* for a three-month Op CARIBBE deployment. Within minutes, he had registered for HAL platform-specific training he would have to complete online, using cloud-based accessible packages over the DLN. The great thing is, he can complete most of the basics concurrently with his nightly activities. Before he did that, however, he also registered for some refresher training. Tonight, he would take a break from the basic navigation and instead, join other members from his unit in the Bluetooth-Enabled Naval Small Arm Trainer to conduct Sig Sauer refresher training.

LT(N) Chan

Lieutenant (Navy) Chan, an Operations Room Officer (ORO) student, is in the middle of the assessment phase of the course in Esquimalt. He's already used to the Naval Combat Training System reconfigurable trainer, because he has already progressed through the initial phases of blended online learning with small controlled events in the trainer (which was, at the time, configured as an individual trainer rather than a team trainer).

As the phase advances through the second week of progressive challenges, he has the feeling of reality, due to the fact that real assets (ships and helos) are linked into the trainer via the Distributed Mission Operations Centre (DMOC) and the RCN Integrated Data Environment. As he conducts his simulated Search and Rescue (SAR) in his simulated Canadian Surface Combatant (CSC) ops room, he does so as HMAS *Warramunga* conducts an at-sea SAR exercise and HMCS *Margaret Brooke* completes some Combat Readiness Requirements (CRRs).

The scenarios and software that power this ops trainer are CSC-specific, but the fact that it is linked through the synthetic environment allows this ORO student to complete his final assessment on the same day that the Australian ship completes its exercise and the same day that HMCS *Margaret Brooke* writes off a series of CRRs prior to proceeding to Nunavut for a summer patrol.

Three other ORO students are in Halifax in a similar trainer, running through the exact same scenarios at the same time (the mission control was actually in Halifax as well). The cost savings in temporary duty (TD) and less time spent training paid for the two trainers in under five years.

C-2 NAVAL TRAINING SYSTEM; PERSONNEL AND TRAINING MANAGEMENT

Director Navy Personnel Management and staff are preparing the briefing binder for a CJOC operational deployment. They start by reviewing the qualifications required for the entire ship's company and attached helicopter air detachment, as well as of those additional mission supporting personnel whether from within the RCN or CAF, Regular or Reserve components. This is done through logging into a single Military Civilian HR Personnel Management System, which would allow super-users to view the entirety of the CAF in terms of Organization & Establishment and where personnel are currently assigned. Noting that there are numerous personnel shortages aboard, each position and groups of positions forming a specific ship capability would be automatically linked in the system design architecture enabling seamless unit readiness tracking and search for personnel with the right qualifications.

This system would provide more efficient and effective automated sourcing taking into account a range of criteria such as fitness, medical fitness, qualifications, previous time away from home, Op TEMPO waivers, courses/postings planned and their home unit impacts. It would also enable accurate graphics of the personnel available, using automated analytics to choose the most suitable person.

As part of the source vetting process, the Career Manager is automatically notified of the impending tasking/Attach Posting/TD in order to confirm that person is not due for posting/career course/promotion. If the Career Manager has no issues, they would clear their notification alert/caveat and the personnel assignment or Attach Posting would proceed. Furthermore, the potential candidate's unit supervisors are auto-informed of a potential tasking and, if required, can submit an impact statement which would proceed through the unit Chain of Command (CoC) for endorsement and dissemination back to the originating tasking office of primary interest (OPI).

On an on-demand basis, NPTG can review a number of analytic products to track everyone's time away from home, leave remaining, number of Attach Postings throughout the year, qualifications or any number of factors either as an immediate snapshot or over time. These tools can also identify course load candidates for members who meet the prerequisites for that course.

When this happens, a sailor will be informed via online message from her CoC that she is loaded on the upcoming advanced course for her occupation. Her CoC was aware this was coming because they were informed six months beforehand by NPTG HQ scheduler tools. These tools identified the member was pre-selected based on her previously satisfying the prerequisites at sea via the DLN system, and her having completed at-sea experience. This information is also tracked by the enterprise digital training management solution. This data, tracked for each member of the RCN, is centrally managed via the enterprise personnel system.

The sailor immediately starts small modular smart phone/personal device deployed (from the cloud) training refreshers because her course starts next week. She shows up on course, already having had the joining information sent to her phone from the enterprise digital training management solution. Classes follow a pattern of online self-learning, facilitated discussion from an expert, and lab-based or multi-role reconfigurable trainer activities. The course is much shorter than it used to be because her pre-learning and experience was tracked and indicated she had already achieved some of the basics. Her instructor/facilitator is well aware of her high skill levels throughout the course because all of her online learning, lab work and trainer events are tracked and the data is stored in the interoperable Learning Record Store, part of the enterprise digital training management solution. Upon completion of the course the enterprise digital training management solution produces a course report. The only additional comment on the report was from her instructor/facilitator who noted her leadership skills and commented that she would be an excellent future instructor.

Her supervisor upon return to the ship was well prepared to employ her in the new role because he already read the report the day it was issued. On day 30 of her new job, she feels she needs a refresher and quickly accesses some of the modularized learning on her personal mobile device for a rapid check. The enterprise digital training management solution authenticates her facial recognition login and can reach into the learning management system to offer her what she needs.

Back at NPTG HQ, the enterprise digital training management solution provides staff with the performance metrics on this sailor, and the thousands of others who receive training. With this information more accurate planning can occur for next year. Furthermore, using attrition figures NPTG would be able to generate forecasts for impending shortages by occupation, qualification or rank.

C-3 ACCOMMODATION RESERVATIONS

The case begins with a short-notice demand for a Naval Staff representative to attend an important supply chain working group at Canadian Forces Base Halifax. At the eleventh hour, the staff officer reaches for his unit-issued iOS tablet resting on the bedside table synced to a 5G wireless network. He applies his fingerprint, unlocks the tablet, swipes through his Apps and selects the "RCN Base Accommodations" icon. The staff officer selects his desired accommodation location – Juno Tower, Halifax and confirms desired dates of stay.

The online booking engine recognizes his App sign-in credentials, automatically applies profile preferences, synchronizes Base meal plans, links to pre-authorized financial coding, and gives the guest the ability to make a reservation within the space of a few taps. Availability is updated instantaneously, and the staff

officer receives a system notification that no vacancy is available, followed by an alternate reservation offer at a local preferred hotel using an all-in-one integrated metasearch solution, supported by pre-facilitated DND hotel contract pricing. The staff officer accepts the reservation and receives an automatic confirmation email and text message. Payment information is processed effortlessly through an integrated enterprise solution, leaving the staff officer free of personal payment and need for manual reconciliation of expenses on his travel claim. Mobile-friendly functionality, speed and an attractive interface provide the staff officer with a seamless booking experience, making life easy and responsive, thereby eliminating a vexing and lengthy booking process.

As you can imagine, the benefit of a digitally enabled booking solution not only provides accommodation guests with invaluable digital convenience and confidence, but it provides Base and facility management with a vast quantity of analytic search and booking data for enhanced Logistics analytics to support accommodation forecasting, booking utility, business planning, predictive modelling, material life-cycling and even user feedback for improved quality of service delivery to sailors and guests.

C-4 MANAGING CREW VOLATILITY

HMCS *Harry DeWolf* is scheduled to deploy to the Caribbean in support of Op CARIBBE 01 December 2026. An Air Detachment will be embarked, in addition to a team from the United States Navy (USN) who will assist in vessel identification. To conduct work-up training and all pre-deployment certifications, the command team requires the deployment crew to be posted in by active posting season 2025. Historically, the vessel would be established with a ship's crew of 65 and the air crew would be attach posted from the Royal Canadian Air Force (RCAF). Bunk space would be made available for the additional USN crew through a creative process of re-allocating and rearranging of cabin space.

However, since the RCN has modernized its HR technology with a sophisticated and integrated HR management system, the planning for this deployment took place much earlier. Validated data was used to predict the establishment that will be needed to complete the assigned mission. Subject matter experts used analytics tools to identify the tasks that will need to be accomplished and the core and enhanced skills that will be required, and predicted the ranks/occupations that will be necessary to achieve success. The system also predicted the level of volatility—the number of personnel expected to be unavailable due to illness or injury, career coursing and even compassionate status—and recommended additional personnel be prepared for the deployment. D Nav P&T then created a tailor-made establishment for this mission.

As the requirement for these occupations/ranks is signaled, so are the requirements for all other operational vessels within the RCN on a continuous basis so that a more accurate demand signal can be sent from D Nav P&T to Canadian Forces Recruiting Group (CFRG) and NPTG. The RCN requirements are known in greater detail and further in advance, so the RCN can better support CFRG with targeted attraction and recruitment in order to ensure that a sufficient number of recruits, with the right skill sets and experience are enrolled. Similarly, NPTG can be better prepared to conduct just-in-time training for these recruits, ensuring that career development is aligned to the needs of the fleet and the RCN. All of this has the added benefit of attracting even more applicants, since the RCN is able to inform candidates, more accurately, what the first few years of their career will entail (including an exciting deployment to the Caribbean in HMCS *Harry DeWolf* in 2026).

In 2026, the establishment for HMCS *Harry DeWolf* may vary from the establishment of HMCS *Margaret Brooke* due to the predicted volatility and operational schedule of one vessel versus another. The ease of access to clean HR data, flowing into a single HR management system, in addition to predictive analytics programs (which get smarter over time) results in the optimum establishment for a vessel. It also results in the early demand signal sent to our recruiting and training systems to produce the right people at the right time.

C-5 SMALL BOAT DATABASE

The Small Boat Database, provides a centralized reporting of all RCN Small Boats, by location, make, status, certifications, and fitted navigation/communications suites. The information provides a valuable indicator of the RCN small boat availability which assists Formation Small Boat OPIs, Materiel Management, and tactical level decision-makers at identifying asset availability for both training and operational requirements. This case is assessed as low complexity.

“On a Sunday, the day before departing for IMSRT, MS Brassard, a Bosn’ in HMCS Fredericton (FRE) identifies a major issue with the communication suite on the ship’s SO RIB. He contacts his supervisor, PO2 Sears, to inform her that the SO RIB needs to be sent for repair. After hanging up the phone, at home, PO2 Sears opens the Small Boat Database application to identify a potential replacement. She sees that HMCS Ville de Quebec (VDQ) has a fully functional SO RIB and knows the ship is currently in a SWP. Using the application she requests to transfer FRE’s SO RIB to maintenance and identifies VDQ’s SO RIB as a potential replacement during IMSRT. PO1 Crocker, the MARLANT Small Boat OPI and PO2 Nelson, VDQ’s Small Boat POC receive a notification of the transfer request and approve both. Once approved, action notifications are sent to the PO2 Sears and PO2 Nelson, with PO1 Crocker and Mr. Gillis, the SO RIB LCMM info’ed.”

SMALL BOATS EAST COAST FLEET EFFECTIVE: 4-Dec-18

PLATFORMS	UNIT	HULL #	LOCATION	STATUS	CT EXP	AIS/VHF/NAV	FUEL	COMMENTS	ETR
RIB MAKO	MONTREAL	02-343-69	ON LOAN	GREEN		NO	DIESEL	On loan to NFS(A) Boatshed - BMO 081317Z JUN 18 -	
SR2A	MONTREAL	02-368-019	SHORE OFFICE	GREEN	Oct-19	NO	GAS		
SR2A	MONTREAL	04-368-094	SHORE OFFICE	GREEN	Oct-19	NO	GAS		
RIB MAKO	CHARLOTTETOWN	96-343-52	ONBOARD	GREEN	Sep-19	YES	DIESEL		
SR2A	CHARLOTTETOWN	07-368-133	ONBOARD	GREEN	Apr-19	NO	GAS		
SR2A	CHARLOTTETOWN	02-783-029	ONBOARD	GREEN	Apr-19	NO	GAS		
RIB MAKO	FREDERICTON	99-379-66	ISCS / SEA PRO	RED		YES	DIESEL	Tubeset work, in storage until FRE has Davit certified	
SR2A	FREDERICTON	02-783-026	ONBOARD	GREEN	Oct-19	NO	GAS		
SR2A	FREDERICTON	02-368-002	ONBOARD	GREEN	Oct-19	NO	GAS		
RIB MAKO	HALIFAX	91-379-11	ONBOARD	GREEN	Sep-19	YES	DIESEL		
SR2A	HALIFAX	02-783-033	ONBOARD	GREEN	Oct-19	NO	GAS		
SR2A	HALIFAX	04-783-098	ONBOARD	GREEN	Oct-19	NO	GAS		
SO RIB	ST. JOHN'S	2449	ONBOARD	GREEN		YES	DIESEL		
SR2A	ST. JOHN'S		ONBOARD	GREEN		NO	GAS		
SR2A	ST. JOHN'S		ONBOARD	GREEN		NO	GAS		
SO RIB	VILLE DE QUEBEC	2447	ONBOARD	GREEN	Jul-20	YES	DIESEL		
SR2A	VILLE DE QUEBEC	02-368-006	ONBOARD	GREEN	Apr-20	NO	GAS		
SR2A	VILLE DE QUEBEC	02-368-008	ONBOARD	GREEN	Jun-19	NO	GAS		
RIB PC	ASTERIX	88-343-08	ONBOARD	GREEN	Jul-19	NO	DIESEL	AST RIB PC should be replaced by RIB MAKO in Dec/Jan	
RIB PC	ASTERIX	97-343-55	ONBOARD	GREEN	Jul-19	NO	DIESEL	AST RIB PC should be replaced by RIB MAKO in Dec/Jan	
SO RIB 2nd GEN	TORONTO	18-782-04	ONBOARD	GREEN		YES	DIESEL		
SR2A	TORONTO	02-783-034	ONBOARD	GREEN	Jun-19	NO	GAS		
SR2A	TORONTO	07-783-135	ONBOARD	GREEN	Nov-18	NO	GAS		

C-6 MANAGED READINESS PLAN (MRP) / OPERATIONAL ASSIGNMENT SCHEDULE

The MRP and OAS provide valuable strategic and operational level information to decision-makers at the RCN and Formation level. The information contained within the MRP provides stakeholders with the short-medium term Class maintenance cycle, planned readiness levels and platform availability, while the OAS outlines key Single Ship International Deployer assignments, readiness activities and planned Allied exercise involvement. This case is assessed as low complexity.

AB Jacob, a Steward in HMCS Calgary (CAL), receives a notification that HMCS Ottawa (OTT) has an unanticipated vacancy in the Steward section. He quickly opens the MRP and OAS applications from his smart phone/tablet to check OTT’s position on the ‘road to readiness’, and what trips are on the horizon. Noting that OTT has already completed IMSRT and will be proceeding on Initial Assessment Period (IAP) deployment in two months before heading into extended work period, he contemplates whether he should submit his name for consideration. After discussing the opportunity at home with his spouse, he decides he would like to fill the vacancy. He clicks on OTT’s IAP deployment and submits himself for consideration. A notification of potential candidate is sent to PO1 Lawson, the Senior Steward in CAL, and CPO2 Pyza, the Steward Career Manager. PO1 Lawson concurs with the request and AB Jacob is added to the list of candidates available to fill OTT’s Steward vacancy. Once CPO2 Pyza reviews the list of candidates and selects the one that works best, a notification is sent to all candidates and their supervisors.



