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Maritime Engineering Journal

CANADA'S NAVAL TECHNICAL FORUM

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Canada

A Defence College for the Americas —

Photo: JO2 Paul Newell, USN

Cdr David MacDougall takes us inside the Inter-American Defense College in Washington, DC with a graduate's perspective on the IADC's unparalleled graduate-level Hemispheric Security and Defense Course. — Article begins on page 11

Maritime Engineering Journal

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Director General
Maritime Equipment Program Management
Commodore Roger Westwood, CD

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Cover Photo: This concrete, steel-lined chamber was set up in the late 1980s to conduct full-scale fire-testing of various shipboard furnishing materials. The results were glaringly obvious.

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Commodore's Corner

Reaffirming our Commitment to Submarine Safety and Support

By Commodore Roger Westwood, CD
Director General Maritime Equipment Program Management

When I sat down to write this commentary, I could not help but be reminded of an earlier Commodore's Corner in which my predecessor, Cmdre Jim Sylvester, discussed vessel safety management (*MEJ Summer 2003*). In his editorial, Cmdre Sylvester wrote that safety is not an absolute quantity, probabilistic at best, and that the challenge to us is to develop an acceptable balance of effort and cost that best mitigates those things deemed to be "unsafe." Sadly, the tragic events involving HMCS *Chicoutimi* have once again focused attention on the SUBSAFE program and its key role in ensuring that submarine operations and support meet stringent safety objectives.

As we mourn the loss of one of our own in the person of Lt(N) Chris Saunders, and struggle to deal with the aftermath of the accident that led to his death, it is important that we publicly affirm that we are doing everything we can to ensure the safety of Canadian submarine operations. Although much of the detail of the circumstances surrounding the *Chicoutimi* fire remains the purview of the Board of Inquiry, I believe it is important that we in the naval technical community continue to demonstrate our commitment to safety as it affects the Canadian submarine fleet.

Almost five years ago the navy entered a new era of submarine experience with the arrival of HMCS *Victoria* in Halifax. The introduction of *Victoria* on the navy's books made a huge impact on the work required of the naval technical community, a workload that steadily increased with the delivery of *Windsor* and *Corner Brook*, and with the effort leading to the acceptance of *Chicoutimi*. Today, DGMEPM, the Fleet Maintenance Facilities (FMFs) and other units are heavily involved in the business of submarines, and many changes have been made with respect to process and organizational restructuring to handle their unique demands. Within all of our organizations we are continuously examining potential new relationships and efficiencies that will improve our support to the fleet and particularly the *Victoria* class.

"...it remains our responsibility to maintain our professionalism, learn from our experience and move forward...."

It has not been an easy ride, but we have made clear advances in submarine safety, repair processes, engineering changes and submarine specification preparation. Our perspective is rapidly widening as we involve industry more and more in second- and third-line submarine repair and overhaul work. Indeed, the participation of industry will become even more prevalent in the conduct of extended docking work periods, and in the delivery of a *Victoria*-class in-service support contract requirement that is now well on its way to being opened to competition.

Submarines form an integral part of the navies of more than 45 nations, including Canada. Without question, the *Victoria* class enhances our combat-capable, multi-purpose force and brings with it an effective capability for surveillance and combat. In the short term we will be dividing our engineering support talent between surface and subsurface tasks, and balancing our capital and national procurement expenditures to ensure the entire fleet is well supported. On that front, the advances we have made with submarine material certification may even affect the way we do business with other ship classes.

We have faced many challenges in our effort to introduce the *Victoria* class to the fleet, and more tough work lies ahead. While we have not been without our setbacks, it remains our responsibility to maintain our professionalism, learn from our experience and move forward, building upon the successes we have achieved to date. I urge you to do everything you can to keep a positive outlook as we work toward our goal of giving the *Victoria*-class submarines the support they need to patrol the ocean's waters safely for many years to come. We owe at least that much to Lt(N) Chris Saunders, his shipmates and to the families who were so deeply affected by the events in *Chicoutimi*. In the final analysis, we owe our determination to succeed to Canada.

Shipboard Furnishings:

Fire Risks of Furnishing Materials

Article by Sue Dickout

> "The fighting strength of a ship depends as much on the fitness of her crew as on the firepower of her armament: nothing is gained by the installation of additional weapons and equipment if, thereby, living and working conditions deteriorate to a point at which the physical and mental efficiency of the ship's personnel is seriously impaired."
>
> ***— BR 1882, Habitability Manual for HM Ships, 1959.***

This statement, published more than 45 years ago, reflects the recognition in the post-war period that habitability improvements do contribute to the operational performance of a ship. While illustrations from the same manual show an idealized view of shipboard accommodation spaces during this early post-hammock period, the reality was often quite different (*Fig. 1*). However, many factors which contribute to habitability and improvement to comfort can actually compromise a ship's operability by putting the ship at greater risk. This article will discuss changes in furnishings and how these changes contribute to risk for a ship and its personnel.

At the time reflected in the drawing in *Fig. 1* — the late 1950s and early 1960s — traditional materials such as wood, natural fibre padding and wool and cotton fabrics made up most furnishing materials on ships and on land. As polymers, plastics and synthetic fabrics began to take over, fire authorities came to realize that the new materials presented greater fire hazards. They tended to ignite more easily, burn faster and produce more smoke and toxic gases than the materials they replaced. When materials and designs with better fire performance started to be introduced in the 1970s, they quickly became the new standard and were subsequently required for shipboard use.

In the late 1970s, fire-testing of materials destined for Canadian naval ships became an important function of the materials section of the navy's maritime engineering (now maritime equipment) headquarters division in Ottawa. Small-scale tests were performed to measure ignition properties, smoke production, toxic gas production and heat release, and materials were selected based on the results. In 1986, Canadian Forces Technical Order CFTO D-03-010-001/SF-001 (Specification for Fur-

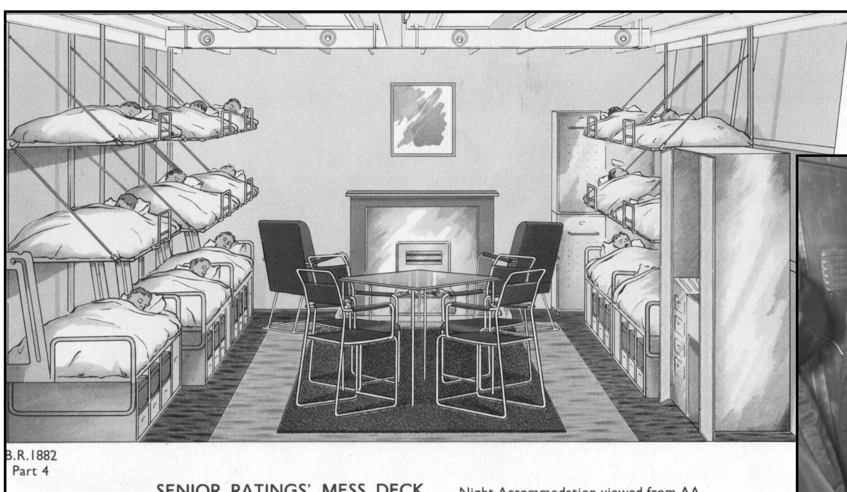


Fig. 1. Above is an idealized view of a post-war seaman's messdeck taken from Book of Reference 1882 – Habitability Manual for HM Ships (1959). The photo at right is probably closer to the reality of shipboard accommodation for most Canadian sailors from the 1960s to the 1980s.

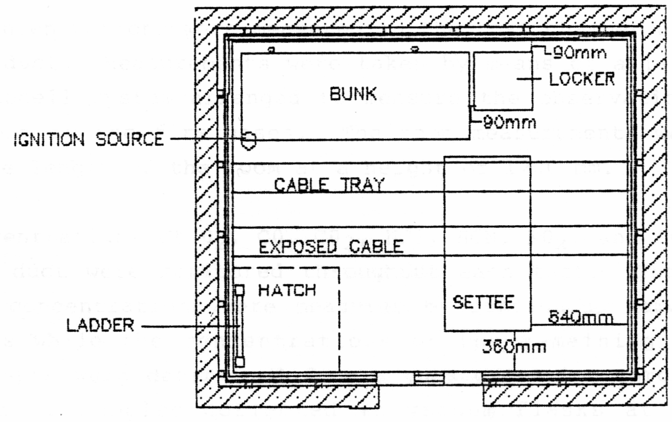


Fig. 2. This 2.5-metre x 3-metre concrete, steel-lined chamber was set up at the National Research Council facility in Ottawa in the late 1980s to conduct full-scale fire-testing of various shipboard furnishing materials. The chamber was outfitted with a typical three-bunk tier, settee and locker. As is explained in the text and illustrated in Fig. 3 below, the difference between the fire performance of old- and new-type furnishing materials was glaringly obvious.

nishing and Finishing Materials for HMC Ships) was produced to implement these requirements. The CFTO lists materials which can be used in ships' furnishings, based on fire-testing, experience and a principle of minimization.

Small-scale fire tests have their limitations. Testing small pieces of material for individual properties does not necessarily reflect the fire performance of whole furniture items or compartments. The materials section attempted for some time to obtain funding for full-scale fire tests, but better impetus for this type of testing came only after many reports emanating from the 1982 Falklands conflict indicated that shipboard materials had contributed to severe fires.

Between 1986 and 1988 a series of ten fire tests was conducted for the Department of National Defence by a private company and the National Research Council. The test chamber (*Fig. 2*) was a 2.5-metre x 3-metre compartment built of concrete block, lined with welded steel panels and typical shipboard fibreglass insulation and coatings. The only opening was a 1-metre-square hatch. The ignition source was a propane fire, modeled on the heat content and burning characteristics of a small quantity of JP-5 aviation fuel. This source was selected because of the navy's experience with a messdeck fire involving JP-5 helicopter fuel in HMCS *Nipigon* in 1965.

Testing was conducted on a three-tier bunk unit and a small settee using two generations of materials. "Old generation" tests used polyurethane foam in the mattresses and settee, while "new generation" tests used polychloroprene foam. Open bunks, such as those installed aboard the old steam destroyers, and solid pan bunks typical in the *Halifax*-

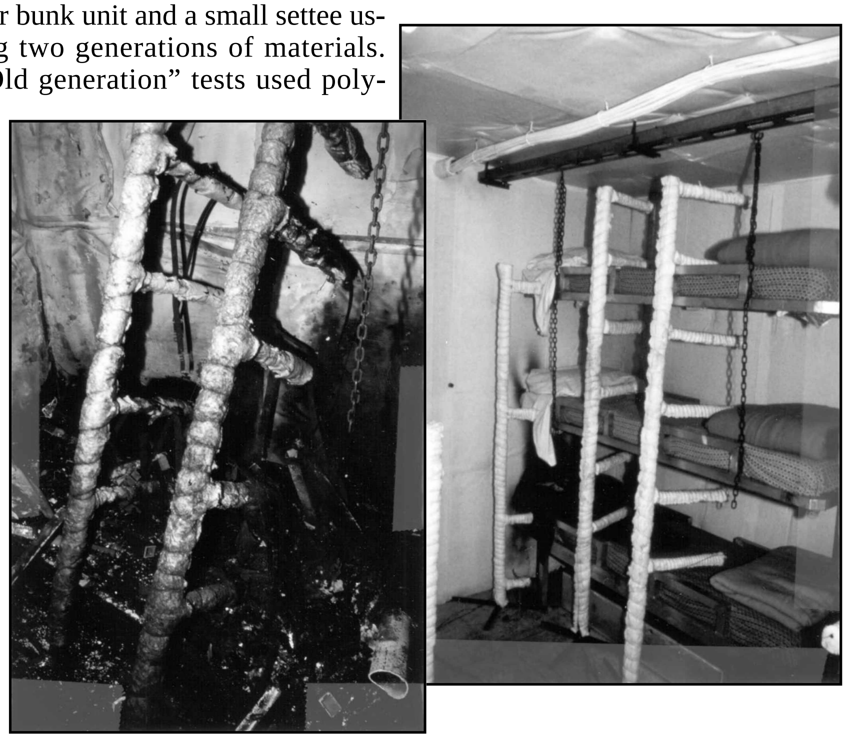


Fig. 3. The choice of material can play a critical role in the level of fire risk. The photo at left shows all that remained of a tier of bunks with polyurethane mattresses, ignited with a 2½-minute propane flame. Compare this with the condition of polychloroprene mattresses (right) on the same type bunks, with the same ignition source and after 30 minutes of burning.

Fig. 4. Which of these would you choose for your ship — the well-padded couch, or the traditional DND settee? It may not look like much, but the settee represents a greatly reduced fire risk thanks to its steel frame, polychloroprene foam padding and minimal material quantity. The use of wood, polyurethane foam and unregulated material quantity in commercial furnishings such as the couch shown above, and in customized bars and other habitability "improvements" dramatically increases the fire load on board ship.

class were used. Ventilation conditions were varied. Results between the old and new materials were immediately obvious (*Fig. 3*). Where the older polyurethane foam bunks and settee were completely consumed by fire within four minutes, the polychloroprene foam furnishings did not contribute to the fire. With an identical ignition source, the newer mattresses did not ignite even though the bedding continued to burn for 30 minutes. These tests showed unequivocally that material selection can have a major effect on fire performance.

Prior to the commissioning of the *Halifax*-class frigates, shipboard furnishings were selected by National Defence Headquarters. But because the *Halifax*-class was not designed in-house, some changes were made to the accommodation outfit with the installation of suspended ceilings, panelling materials, etc. A second change in the Canadian Forces that affects ships' outfit today is local procurement, which gives ships greater autonomy over their own spending and the selection of items. This statement is a simplification, but overall this has led to a greatly accelerated pace of change to lounge and messdeck furnishings.

Although it may be the impression in the fleet that the standard ship settees were designed to be as uncomfortable as possible, they were actually intended to reduce fire risk by minimizing the amount of flammable material present. Comparing a standard settee with the type of couch generally selected for procurement with ship's funds, the differences are substantial and go beyond the visible. The well-padded couch pictured in *Fig. 4* may seem to be the better choice in terms of comfort over a traditional DND-approved settee, but what does it say about fire risk? The couch probably contains ten times the amount of flammable material of the traditional settee.

DMSS 2-4 has granted permission for the use of polyurethane foam

Fig. 5. The cafeteria and lounge spaces of today's Canadian warships (below) contain a disturbing amount of flammable furnishings and decor materials, far more than 20 years ago (right). The negative implications of this type of practice, especially for ships on operational missions, are clear.

Fig. 6. New furnishings featuring greater comfort combined with fire-resistant design are now being procured for shipboard use.

which meets certain fire requirements, but it is still substantially more flammable than the standard material and is invariably present in much greater quantities in commercially designed furnishings. *Figure 5* gives some idea of just how much flammable material can be found in a ship's cafeteria and lounge spaces. There is no question that flammability, fire load and projectile hazards in today's fleet have been significantly increased by the addition of cabinetry, panelling, storage and other non-approved items. While some ships have attempted to meet fire requirements, and some new furniture items which combine greater comfort with a more fire-resistant design are in procurement (*Fig. 6*), overall we do not have an appreciation of the risks and the actual fire load of ships' present configurations.

No one wants to be the furniture police, telling ships what they can and cannot have. We need a consistent policy and the support of the Chief of the Maritime Staff. Nonetheless, the risks of unbridled increase in furnishings and other items must be considered and balanced against ships' operational requirements. The old "War Readiness Check-Off List" required ships preparing for operational missions to land all excess furnishings and decor items, all non-NBCD wood, all sports equipment, and all personal electrical items. This is completely opposite to current practice on ship mission deployments. It is clear that "Quality of Life" is not counterbalanced by "Quality of Operational Readiness" or "Quality of Survivability." In the interests of the entire fleet, this imbalance must be re-examined.

Sue Dickout is a chemist, and the Materials subsection head in DMSS 2. This article was prepared from a presentation she delivered to the MARLANT Technical Seminar in April 2004.

Maritime Engineering Journal Objectives

• To promote professionalism among maritime engineers and technicians.

• To provide an open forum where topics of interest to the maritime engineering community can be presented and discussed, even if they might be controversial.

• To present practical maritime engineering articles.

• To present historical perspectives on current programs, situations and events.

• To provide announcements of programs concerning maritime engineering personnel.

• To provide personnel news not covered by official publications.

All Electric Ship:

An Industry Solution to Seamless Integration of AES Machinery and Controls

By Mirko Maksimcev, M.Eng., P.Eng.

Designing and building reliable and maintainable naval vessels that meet all performance specifications at minimum life-cycle cost points toward the all-electric ship (AES) as the most likely solution. AES design challenges are very different from those associated with traditional designs featuring mechanical propulsion. Unlike mechanically propelled vessels, the AES concept requires that special attention be paid to the issue of power quality. The all-electric ship concept by itself does not necessarily provide a better result than, say, a well designed traditional mechanical propulsion ship. The benefits of AES are realized best when the electrical system integration follows some strict power system design practices, and the control system ties software and hardware together in a seamless manner (see *General Control System Design Guidelines*, page 8).

This article deals with the control system aspect of AES design. It presents an illustrated example of how the main power plant and power distribution of an all-electric ship can be integrated with the ship's automation system (often referred to as a power and/or vessel management system, integrated machinery control system, or integrated platform management system).

An Industry Example of an Integrated System Design

An example of good all-electric hardware/software system integration is borrowed from the 1997 refit of a 20-MW semi-submersible drilling platform. The system integration design became a benchmark in that, from 1997 to 2000, it offered the least down-time in the owner's fleet of dynamically positioned vessels. Although nothing new by industrial standards, the electrical design and system integration were well advanced even for the selected classification society, and generally presented a considerable novelty in the marine world in 1997.

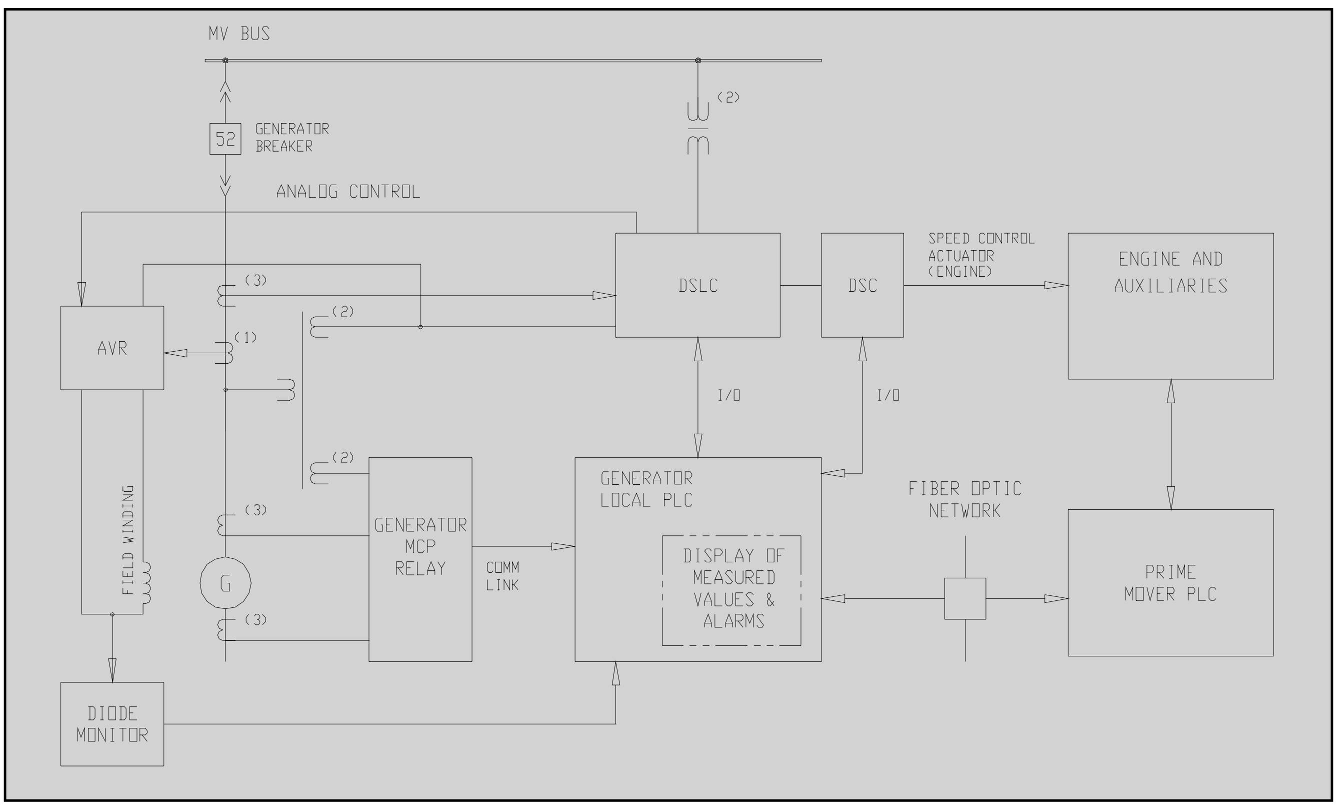


Fig. 1. Generator control panel block diagram for a 20-MW semi-submersible drilling platform

The concept is directly applicable to naval all-electric ships built around relatively high-demand performance specifications with the lowest life-cycle cost in mind. To illustrate the design philosophy, a generator switchgear cell control panel featuring four main building blocks is presented here as an example. The main building blocks are the following digital devices:

- generator relay, providing all protection (overcurrent, differential, over/under voltage, over/under frequency, negative sequence, loss of excitation, overexcitation), breaker control and failure alarms, as well as voltage transformer loss and inadvertent energizing, plus measurement of all generator and bus electrical parameters;
- synchronizer and load-sharing relay;
- engine speed controller (governor); and
- local programmable logic controller (PLC), tying the generator panel into the higher automation system.

Benefits of All-Digital Integrated System Design

The all-digital metering, control and protection concept has the following advantages over the traditional design:

- simplification of design;
- effective communication with the ship's automation system;
- maintenance-free main power plant and power distribution system;
- reduced life-cycle cost;
- reduced onboard/off-board spares;
- 20 times reduction in hard-wiring that is often a cause of equipment malfunction;
- extremely low down-time, resulting in very high system reliability.

The main relays and PLC meet all general and particular requirements of generator metering, control and protection (see *Protection and Metering — Particular Design Guidelines*, page 10). Relays use 960-Hz sampling frequency and the discrete Fourier transform to compute values of voltage, current and frequency. The algorithm is immune to harmonics of the fundamental frequency. They use state-of-the-art digital signal processing techniques to measure the electrical parameters, thereby eliminating analogue hardware (i.e., transducers). They also require less current transformer hardware (i.e., one set of current transformers is sufficient for relaying and metering unless differential protection is considered). Other control relays (i.e., automatic voltage regulator, rotating diode protection, etc.) must operate in the distorted current and voltage environment.

How it all functions

As we see in *Fig. 1*, all protection, metering and breaker control is handled by a digital, multipurpose generator metering, control and protection (MCP) relay. The digital synchronizer and load control (DSLC) relay takes care of synchronizing and load sharing over a separate twisted pair network communicating with five other generator sets (no cross-current compensation wiring is required). The digital speed control (DSC) relay digitally controls the engine speed via a connection to its actuator. All measurements and alarms are constantly available on the local digital display as well as remotely in the control room. No analogue meters are necessary. The local programmable logic controller replaces all relay logic and serves as a communication hub for collecting the local digital/analogue signals and alarms from the relays, generator and auxiliary devices, as well as breaker status information. The local programmable logic controller communicates the commands from the remote-control room to the generator cell, and vice versa.

General Control System Design Guidelines

- Build a true distributed control system whereby the unavailability or malfunction of any subsystem has no effect on the functionality of the rest of the system.
- Eliminate/reduce analogue metering, control and protection equipment to avoid drifting problems and a requirement for frequent, costly calibration.
- Use redundant digital communication instead of hard-wired connections wherever possible (i.e., fibre optic, or twisted pair type communication channels).
- Use microprocessor-based hardware to eliminate all auxiliary relay logic, and for communication hubs in the system.
- All metering, control and protection devices must be insensitive to harmonic distortion and/or notching imposed by the power electronics equipment.
- Use multipurpose, microprocessor-based devices wherever possible to minimize the amount of engineering effort and the number of required spares, and to simplify the design.
- Create a system with a minimal number of identical building blocks that are fully replaceable and can be swapped for redundancy.
- All building blocks must be standard COTS equipment widely available on the world market (no prototypes or custom designs).
- All metering, control and protection devices must be parameterized by downloading the data from a portable computer or via a handheld device.

All generator cells are identical and can be swapped in terms of hardware and layout. The rest of the power plant, ship service switchgear, uninterruptible power sources, etc., are designed similarly. Analogue equipment was only used in extreme cases where digital alternatives did not exist (i.e., the automatic voltage regulator and the diode monitor).

All other power plant elements (i.e., feeders, ties, auxiliary cells) can be built around the same distributed control system concept as it was chosen for the generator control panel. The programmable logic controller and relays are the local independent controllers that provide/guarantee proper functioning of their relative subsystem equipment when the rest of the automation system is not functional.

The described concept greatly simplifies the design and results in a highly redundant, reliable and maintenance-free operation. The described system integration approach was of utmost importance to the owner since every day of platform down-time carried a penalty of several hundred thousand dollars. This concept is fully applicable to any naval or commercial marine vessel automation concept, and slightly less so to mechanically propelled vessels due to their electrical plant being more an auxiliary part of the system.

Traditional vs. All Digital Generator Controls

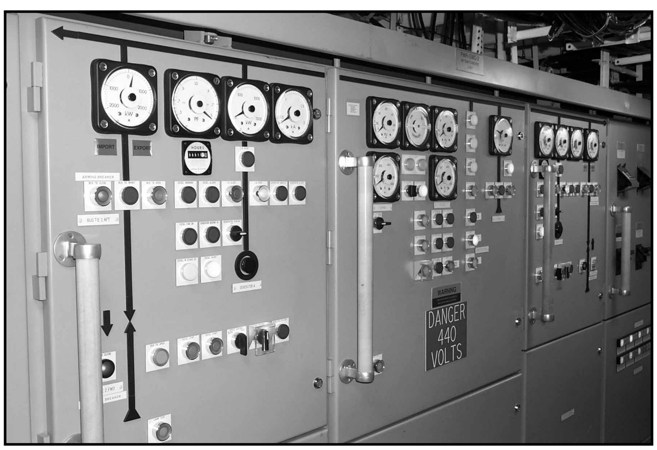
Figure 2 shows three frigate switchgear cells — i.e., two generator cells, with a paralleling cell in the middle. It represents standard design practice in traditional mechanical propulsion ships such as the *Halifax*-class frigates. All controls are analogue and all critical functions are hard-wired for local and remote control.

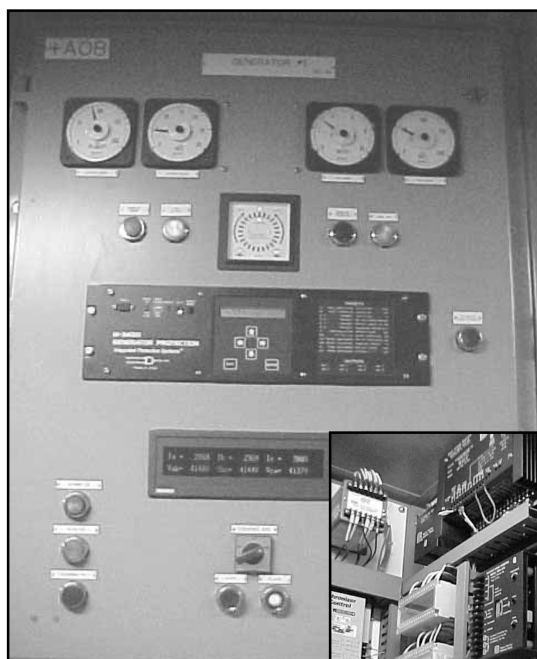
Compare this with the single, digital self-contained generator cell (*Fig. 3*) that is designed with the previously described all-digital concept of seamless hardware/software integration. Although simple on the outside, the generator control panel is packed with widely available standard COTS digital control devices. The design work only involved integrating these devices into a coherent system.

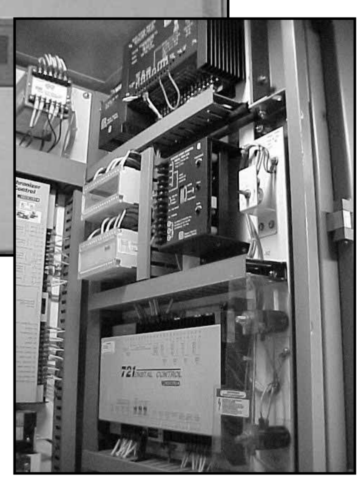
The digital cell does not rely on any other paralleling section and, apart from the two rectangular devices on the front panel (one is the generator protection relay, the other is the digital display), does not require any analogue controls. In this particular instance, analogue controls were added to satisfy the owner's engineer who was not entirely happy with having only a few devices on the panel. He wanted to have some feel for the engine actuator current and voltage, excitation current and voltage, as well as some visual indication of the synchronizing process. Still, none of these controls was required for proper functioning since the control panel handles all described functions digitally.

Summary and Conclusion

What exactly was done here? The most advanced COTS technology







Figs. 2 and 3. In this example (above) of equipment fitted in the *Halifax*-class frigates, the two generator switchgear cells flanking a paralleling cell represent standard design practice in a traditional mechanical propulsion design. Compare this with the single, self-contained digital generator cell in Fig. 3 at upper right, which epitomizes the elegance and efficiency of seamlessly integrated hardware and software in an electric design. The digital unit does everything and more, and unlike its analogue cousin can operate independently. A peek inside the cabinet (inset) is a lesson in the clean, functional component layout of an all-digital, integrated system design.

was utilized to its maximum capability. Analogue equipment has been minimized, while every analogue signal has been locally converted to digital. Instead of designing a complex hard-wired mesh that is prone to failure, all communication is handled through a redundant digital network. All measured and monitored values were passed into a digital communication medium, allowing vessel system management to be controlled from one remote console. All system building blocks have been provided with their own "brain"— the local programmable logic controller — and are all identical and exchangeable. The system's reliability is based on a great number of maintenance-free, self-contained digital blocks interconnected via a redundant communication network.

It is possible to dramatically increase the system reliability of the all-electric ship and reduce its life-cycle cost by applying strict design rules. The result of such design practice has been proven in the offshore industry and can be applied to naval ship design. The described concept greatly simplifies the design process while seamlessly integrating the ship's hardware and software through digital communication channels. Although more expensive at the equipment acquisition stage, this concept is much more affordable in the long run since it relies only on condition-based maintenance. The little maintenance involved often justifies the use of the term "maintenance-free."

System reliability in a fully integrated all-electric ship is much higher than in ships using traditional systems. Experience has shown that if a digital device does not fail within its first 24 hours of operation, it probably won't fail at all. The concept opens many new possibilities for automation, such as multistage automatic load-shedding and electrical system stability margin management. It also provides new possibilities in the area of integrated platform management with the application of very advanced advisory systems, further reduction of manning, and integration with onboard navigation systems.

Mirko Maksimcev is an electrical propulsion systems engineer with DMSS 3. Prior to joining the Department of National Defence in 2002 he worked as Senior Systems Engineer and President of Montreal Systems Engineering Inc., and as a senior systems engineer with Siemens Canada Ltd.

Protection and Metering — Particular Design Guidelines

Protective relays must provide:

• required protective functions appropriate for the application;

• self-diagnostics of the relay and circuit-breaker system;

• accurate root-mean-square metering of distorted electrical inputs;

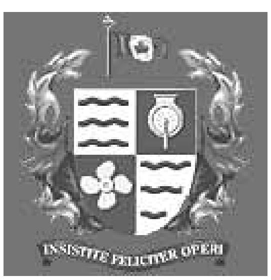
• circuit-breaker trip and event logging;

• oscillography and waveform capture for fault and harmonic analysis;

• local programming and data viewing with onboard keypad and display;

• remote communication over a serial bus with the vessel management system;

• improved performance, greater flexibility and reduced panel space and wiring in comparison with electromechanical or solid state single-function relays.



Mari-Tech 2005 (Ottawa, June 1-3, 2005)

The Ottawa Branch of the Canadian Institute of Marine Engineering is hosting Mari-Tech 2005, a symposium on the theme of "Marine Security and Logistics" from June1-3, 2005 at the Crowne Plaza Hotel in Ottawa. Marine engineering and technology, the traditional basis of the annual Mari-Tech conference, will be reflected in the exhibition and papers program.

Security in all its forms will continue to be a dominant issue for the foreseeable future, for governments, industry and individuals. It is particularly relevant to the marine sector, which handles much of Canada's trade and has prime responsibility for coastal surveillance and security enforcement. The conference will focus on national and regional marine security needs, plans and progress.

A secondary focus of Mari-Tech 2005 is logistics, a critical element in all marine organizations and operations. The current item of interest is the navy's Joint Support Ship (JSS) Project, currently in the prequalification phase.

There is more information on the Internet at www.maritech.ca, where you can register or reserve a booth on-line. Or register by contacting registrar Al Kennedy at akennedy@sympatico.ca, by telephone at (613) 521-8713, or by fax at (613) 521-8100.

Postgraduate Education:

Inter-American Defense College — A Graduate's Perspective

Article by Cdr David MacDougall

Canada's participation in hemispheric security efforts has been of long standing, and in the last few years has grown to include formal involvement with the Inter-American Defense Board (IADB). A major component of the IADB is the Inter-American Defense College, an international educational institution opened in Washington, DC in 1962 to promote the study of hemispheric security and defence issues. The Canadian Forces has been sending students to the Inter-American Defense College since 1998, and to date eight senior officers have graduated from the 11-month Hemispheric Security and Defense Course.

It's not all classroom work at IADC. Academic visits within the United States and to other countries in the Americas enhance students' understanding of security and defence issues relevant to the western hemisphere. ***(Photos by JO2 Paul Newell, USN)***

By way of background, the Inter-American Defense Board has been in continuous existence since 1942 and is the oldest international organization still in existence. It predates both the United Nations and the Organization of American States. Throughout its 63-year history the IADB has dedicated itself to the security of the Americas, fulfilling its responsibilities by drawing upon the resources and expertise of the armed forces of its member nations. Twenty-three of the 34 OAS countries are active members of the IADB, Canada included. Canada's current Chief of Delegation to the IADB is Rear Admiral Ian Mack, Commander of the Canadian Defence Liaison Staff in Washington. The Deputy Chief of Delegation at the Canadian embassy in Washington is Colonel R.R. (Dick) Ryan.

The relationship between the Inter-American Defense Board and the Organization of American States (the primary multilateral political body in the Americas) has been marked by ambiguity since the inception of the Board. Although the IADB is an inter-American agency with the aim of facilitating co-operation on military matters of common interest, it is not an integral or constituent part of the OAS. However, the IADB does serve as an advisory body to the OAS in matters of a "technical military nature" and acts in conjunction with the organization in planning and preparing the defense and security of the Americas.

Over the last 45 years the IADB has provided military advisory services and/or military observers to the OAS during such occasions as peace negotiations in the Dominican Republic in the 1960s, the 1969 Honduras-El Salvador crisis, Belize in 1972, and the 1976 border dispute between Honduras and El Salvador. Since then, the IADB has increasingly emphasized its growing expertise in the removal of anti-personnel land mines, fostering international confidence and peacebuilding measures, and mitigating natural and man-made disasters.

The Inter-American Defense College

The IADC, which opened on October 9, 1962, operates under the aegis and funding of the Inter-American Defense Board and the Organization of American States. The College is hosted by the U.S. military at Fort Lesley J. McNair in Washington, DC in a building donated and furnished by the United States Government. It is worth noting that although the United States continues to play host and main benefactor to the IADC, the faculty and student body are predominantly non-U.S. nationals. Such broad international participation at the IADC offers students and teaching staff alike a remarkable opportunity to exchange ideas and foster better inter-American understanding.

The languages of instruction at the Inter-American Defense College are Spanish, English and Portuguese. (French is an official language of the IADB, but is not used at the College.) Lectures, presentations, briefings and all other activities in plenary session are usually given in the lecturer's native language, with simultaneous translation into any of the three main languages. When students break into smaller working groups, however, the sessions are generally conducted in Spanish, the primary language common to the vast majority of students.

The IADC can accommodate a maximum of 60 students per course, with a typical student body being in the region of 45-50 people. Nominations are not restricted to IADB member nations, as any country represented in the Organization of American States is allowed to send up to three candidates (Canada typically sends two). Since not all countries fill their quotas, other countries are able to send extra students. In 2003-2004, for example, Venezuela sent eight students to the IADC, while the United States sent 11.

The first class of 29 students representing 15 American republics received their diplomas on March 20, 1963, with U.S. Vice-President Lyndon Johnson on hand to deliver the graduation address and present diplomas. To date the College has graduated 2,025 students from 23 different countries, with about 40 percent of graduates rising to general officer/flag rank or civilian equivalent and occupying senior leadership roles in their respective countries. Many cabinet-level ministers and defence chiefs serving throughout Latin America are graduates of the IADC.

IADC's Hemispheric Security and Defense Course

The College's 11-month Hemispheric Security and Defense Course is a professionally oriented, multidisciplinary, graduate-level program. The course offers senior military and government officials a comprehensive program of study of governmental and democratic systems, the current international environment, and the structure and function of the Inter-American system. It also covers broad-based security issues affecting the world and the hemisphere.

The 46-week syllabus consists of 1,400 hours of graduate-level study broken into four academic periods: Orientation and Basic Information (12 weeks); Assessment of the World Situation (9 weeks); Assessment of the Continental Situation (19 weeks); and, Conclusions, Recommendations, Games and Simulations (6 weeks). The curriculum, which is based on requirements stemming from an analysis of the security situation in the Americas, is set forth by the Inter-American Defense Board to mitigate threats and enhance the defensive postures of the member countries. The learning methodology is largely interactive, with great emphasis (about 300 hours) on group discussion, seminars, workshops and projects focused on international security co-operation.

The Hemispheric Security and Defense Course involves detailed study of the political, economic, psychosocial and military factors of power, and their influence on hemispheric security. The course begins at the strategic level with an examination of the world situation as it affects the security and well-being of the western hemisphere. As the course progresses, its focus proceeds from the global level to a detailed analysis of the security and defense situation in the Americas on a regional and individual country basis. The IADC's emphasis is on non-traditional threats to the region's democratic governments. Academic visits within the United States and to other countries in the Americas greatly facilitate and enhance a broader understanding of the security and defence issues relevant to the western hemisphere as a whole.

Students and faculty of the Inter-American Defense College are fortunate in that they are able to take advantage of unparalleled educational, political and research facilities in the Washington area. In addition to the IADC's in-house program, the College also teaches classes jointly with National Defense University (co-located with the IADC at Fort McNair) and with the National War College. Part of the regular IADC curriculum involves a week-long seminar at the NDU Center for Hemispheric Defense

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Guatemala
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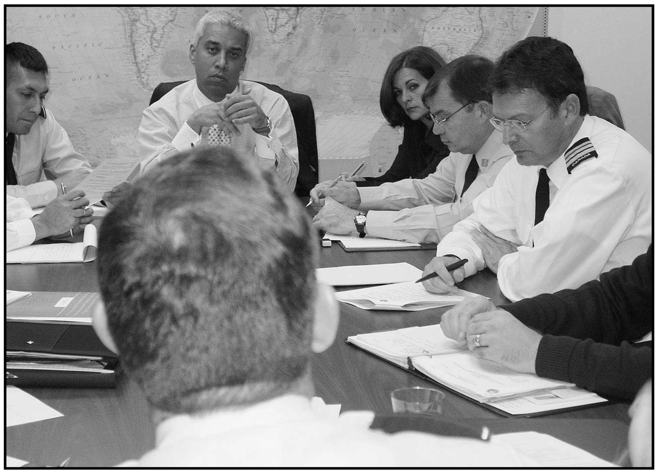
Paraguay
Peru
Trinidad and Tobago
United States
Uruguay
Venezuela

(Panama, Haiti and Suriname are inactive IADB members).



Working group sessions at the Inter-American Defense College are conducted in Spanish, the primary language common to most IADC students and faculty.

Studies, a world-renowned teaching and research institute for Latin American political, social, economic and security matters. Students have the opportunity to attend classes at National Defense University and the National War College for credit, and are able to obtain significant transfer credit from IADC that may be applied towards a master's degree in international relations at either the American University in Washington, DC, or the Universidad del Salvador in Buenos Aires, Argentina.

Conclusions

Attendance at the Inter-American Defense College is, without doubt, a year well spent in a special environment at a unique institution. Canadian navy commanders (and above) and senior civilian employees should give serious consideration to seeking nomination to the IADC. The course is quite unlike any post-Command and Staff Course such as the Advanced Military Studies or National Securities Studies courses. The emphasis on hemispheric security and defence issues shifts the focus to non-traditional threats and concerns such as democratic reform, poverty and social inequality, narco-terrorism, mass migration, and so forth.

And there is this to consider: Canadians being largely concerned with East-West and U.S./European relations bring a particularly unique and welcome point of view to the North-South dialogue of the IADC. Canada is a respected, wealthy nation whose strong democratic values and special perspective on social issues are appreciated by students and faculty alike.

Finally, working and interacting in a Latin cultural and linguistic environment in such an intensive way is a challenge in itself and especially rewarding. Although the IADC is a great place to learn Spanish and Portuguese, candidates should obtain at least a functional knowledge of either language before attending. The Inter-American Defense College is a valuable and highly recommended first step toward employment as a Canadian defence attaché in Central or South America, or in a hemispheric policy job in the Department of National Defence.

More information on the IADC may be found at:
http://www.jid.org/en/college/

Commander David G. MacDougall graduated from IADC Class 43 in June 2004. He is currently the Assistant Canadian Forces Naval Attaché with the Canadian Defence Liaison Staff in Washington, DC. Besides being accredited to the United States Navy, Cdr MacDougall is also a delegate to the Inter-American Defense Board and a political science PhD candidate concentrating on Canada's interests and involvement in the IADB.

Nomination Requirements for Attendance at the Inter-American Defense College

Student nominees must meet the following requirements:

Military Candidates:

- Selection by the nominee's home country;
- Hold the rank of commander/lieutenant-colonel, captain(N)/colonel;
- Have graduated from an advanced command and staff school, or hold an advanced college degree; and
- Have adequate military training and experience at an advanced level.

Civilian Candidates:

- Selection by the nominee's home country;
- Be a government official of an American republic;
- Hold a university degree;
- Have the rank, seniority, professional experience, and possibilities of future employment comparable to those required of military students; and
- <u>Be enrolling in the same course as at least one military student from the civilian nominee's country</u>.

A Historical Perspective of the Canadian Navy's Engineering and Supply Branches

Article by Cdr Mark B. Watson

I recall one of the first wardroom get-togethers after my arrival in HMCS *Huron* in 1989. It was one of those meetings the executive officer called to put down a rumour or get a fact straight, but the discussion soon turned into a "heated" argument over one of the biggest bones of contention among the officers and crew in the ship at that time — specifically, the lack of hot water for showers in the morning. In an attempt to explain the problem and placate the multitudes in attendance, the engineering officer jumped up and drew for us a rudimentary diagram of a faucet. He explained that since cold water is *supplied* through this pipe, and hot water *supplied* through that pipe, the shortage of hot water was in fact not an *engineering* problem, but a *supply* problem! He concluded that the supply officer, therefore, should be the one to answer any and all questions with respect to this dilemma. The sub-lieutenants roundly applauded the EO's successful and clever evasion of the true problem.

For myself, a supply officer under training at the time, this amusing "feat of engineering" provided a comic perspective of the interaction between the supply and engineering departments in our navy. Twenty-five years later, after extensive research for my book *Sea Logistics – Keeping the Navy Ready Aye Ready* (Vanwell Publishing Ltd., 2004), I found out that the relationship between the engineering and supply departments is one that has been intertwined since the birth of the Canadian navy...more so than many engineers are willing to let on.

Naval storesmen with general stores, circa 1960. *(All photos courtesy the author)*

When the Royal Canadian Navy was created in 1910, the officer corps was extremely small. The majority of naval officers were executive branch (the equivalent of today's MARS officers), while engineers were found in much smaller numbers. The smallest officer branch of the fledgling RCN, however, belonged to the accountant officers, the forerunners of today's supply officers. All three of these seagoing branches had firmly established origins in the Royal Navy. Although engineering officers really only came into being with the advent of steamships in the latter part of the 19th century, accountant officers, known as paymasters, could trace their lineage back to the 18th century. In those days they were known as pursers, from which originated the nickname "pusser," a term still very much in vogue in the RCN to describe supply officers up until Unification in 1968.

In 1910, RCN paymasters oversaw all administration and victualling in naval shore establishments and in ships when they were embarked. Accountant officers were carried in Canada's first two warships — the cruisers *Niobe* and *Rainbow* — and later in the cruiser HMCS *Aurora* for a short period of time, but it was not until the Second World War that accountant officers were regularly billeted in major warships. Assisting the paymasters were two trades: the writers and victualling assistants (VAs), neither of which had much to do with the engineering branch. While writers took care of pay and administration, and often acted in a secretarial role for officers, victualling assistants were primarily responsible for storing and monitoring foodstuffs. In this regard they played an important function because they (along with the cooks) planned the meals and ensured that

Naval storesmen from HMCS *Terra Nova* with engineering parts, circa 1960.

a ship had enough food for any journey. There was no refrigeration at this time, so the victualling assistants had to take special care with fresh victuals and were constantly on the lookout for spoilage.

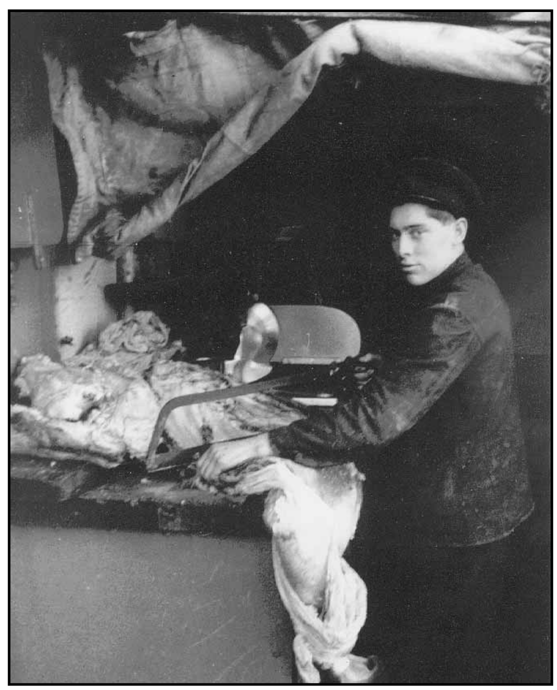
Responsibility for storing other supplies fell outside these trades' expertise and was actually controlled by civilians. The Halifax and Esquimalt dockyards each had a civilian naval stores officer, who along with a small civilian staff was responsible for ordering and storing all naval stores (cordage, paint, etc.) and engineering stores. Because the ships' weapon and engineering systems were very basic, the executive and engineering branches retained responsibility for accounting and controlling their rather limited number of stores, including a small inventory of spare parts.

Things began to change when Canada started acquiring new ships in the mid-1930s. With the arrival of HMC ships *Ottawa* and *Restigouche* in 1938, an increasing number of stores were required to ensure the efficient running of the more complex weapon, communication and navigation systems. The Royal Navy responded to their own similar situation by introducing a stores assistant who, working in parallel with the victualling assistant, would take over accounting responsibility for all permanent and consumable stores of a general naval nature. In 1938 the RCN started to follow suit by posting an additional victualling assistant in ships to take over the naval stores duties. The engineer officer, through one of his ratings who acted as an engineering storesman, continued to be responsible for the ship's engineering stores.

As time progressed, paymasters became more involved not only in paying for a variety of stores, but in procuring them as well. To ensure the most efficient organization possible, close teamwork between the accountant and engineering branches became essential. Ray Dallimore, who joined the RCN as a victualling assistant in 1940 and eventually rose to the rank of commander, remembers the integration of engineering stores into the supply system:

> With the advancing technology and a resultant large increase in the number of electrical and electronic spare parts in particular, it became obvious that the old practise of storing spares and tools adjacent to their parent equipment as in past years was no longer practicable. From the centralized storekeeping practices to be found in the *Prince* ships…senior management was persuaded that the time had arrived for the Accountant Branch to take over responsibility for all stores....[1]

A dedicated supply branch began to appear during the Second World War which absorbed some of the storing functions from the engineers and the civilian organizations. Throughout the war, civilians and naval personnel worked hard to meet the ever-increasing demand for materiel. The corvette shipbuilding program was a case in point, where the need for new construction items under the control of the Department of Defence Production was growing almost daily. Once new ships joined the fleet, the materiel needed to keep them operational further increased the pressure on scarce supplies. The RCN used its contacts with the Royal Navy, the United States Navy and Canadian contractors to satisfy the growing demand for hull, machinery and electrical spares. As a result, naval stores were made up of Admiralty pattern British-made



A victualling assistant prepares beef on board HMCS *Skeena*, circa 1930.

items, Admiralty pattern Canadian-made items, as well as Canadian and American equipment and commercial items. Except for the common commercial items, procurement to replenish was always difficult.

Accountant officers were eventually permanently deployed in frigates and larger ships to take control of all stores, while smaller vessels had a supply rating to handle this duty. With dedicated control and expertise, greater monitoring was permitted. The accountant officer and his staff expedited procurement and delivery of any needed stores. By 1944 it was apparent that the role of the accountant branch had changed, as only 18 percent of the work now being performed by the branch involved pay.

> The rest of the branch's duties involved the clothing and victualling of naval personnel, the handling of naval stores in ships, the operation of naval laundries in the Fleet, the operation of canteens in ships, cyphering, secretarial duties, and giving technical advice in naval law.[2]

Thus, the RCN followed the lead of the RN and the Royal Australian Navy when it renamed the accountant branch as the supply and secretariat branch. Eventually this was shortened to supply branch in 1949. That there was now a "supply officer" instead of a "paymaster" was in keeping with the concept that provisioning was slowly becoming the *raison d'être* of the branch.

A naval storesman from HMCS *Skeena* acquires material from a shore establishment, circa 1960.

In re-examining the wartime stores system it is clear the system had many drawbacks, especially with respect to stores identification, stock holdings, usage reports and an overall lack of co-ordination with the technical and engineering branches inside the RCN. Many of these problems were identified and rectified before the war's end when naval storesmen, a new trade created to handle general materiel such as spare parts and miscellaneous stores, were posted to ships. But this step was small in comparison to what was really needed. The post-war requirements for modern ships had become so intricate that up-to-date business methods were required to keep inventories from becoming bottlenecked. Without modern logistical practices the orderly systemic expansion of the RCN in times of emergency, or even more basically the ability of technologically advanced warships to go to sea and fight, could be jeopardized. The Naval Board recognized that the existing systems were inherently incapable of meeting modern management conditions.[3]

With the exception of initial procurement of clothing, provisions and aviation stores, civilians were still running the naval stores system after the war. The system was still very decentralized, and many would say that the civilians did not fully understand the complexity and demands of modern ships. Aircraft carriers and modern destroyers required a wide array of new equipment — radios, planes, helicopters and weapon systems — each with its own of list of parts that had to be stocked. The old bin and stock card control system was simply inadequate for the wide range of materiel the RCN was now using. Supporting these more technically advanced ships was difficult, and few Canadian officers had any experience managing the complexity and diversity of the materiel needed to run them. Moreover, these ships required enhanced specification of parts and integration between the technical departments and the supply system. What was urgently needed was a more unified management system for naval supplies of all categories . . . in essence, a revolution in the Canadian naval supply system.

Submissions to the *Journal*

The *Journal* welcomes **unclassified** submissions, in English or French. To avoid duplication of effort and to ensure suitability of subject matter, contributors are strongly advised to first contact **The Editor, Maritime Engineering Journal, DMMS, National Defence H.Q., Ottawa, Ont., K1A 0K2, Tel. (819) 997-9355**. Final selection of articles for publication is made by the *Journal*'s editorial committee. Letters of any length are always welcome, but only signed correspondence will be considered for publication.

As a result of a far-reaching internal study entitled the *Peel Report* published in January 1949, the Naval Board transferred responsibility to the supply branch for procurement, warehousing, distribution, cataloguing, inventory control and accounting of all equipment and stores required for the naval service (other than armament equipment). This was a complete change to the traditional function of the supply branch which had up to that point been primarily responsible only to the user for holding and accounting for stores in the fleet. Materiel held ashore in the depots and dockyards now became the responsibility of the Director of Naval Stores (a civil servant),[4] and with this change, for the first time in the history of the RCN, naval officers took over direct control of the supply systems on the coasts and in Ottawa.[5] With its greater understanding of naval operations, the newly empowered supply branch was able to provide better service to the fleet, and especially to the navy's engineering branch.

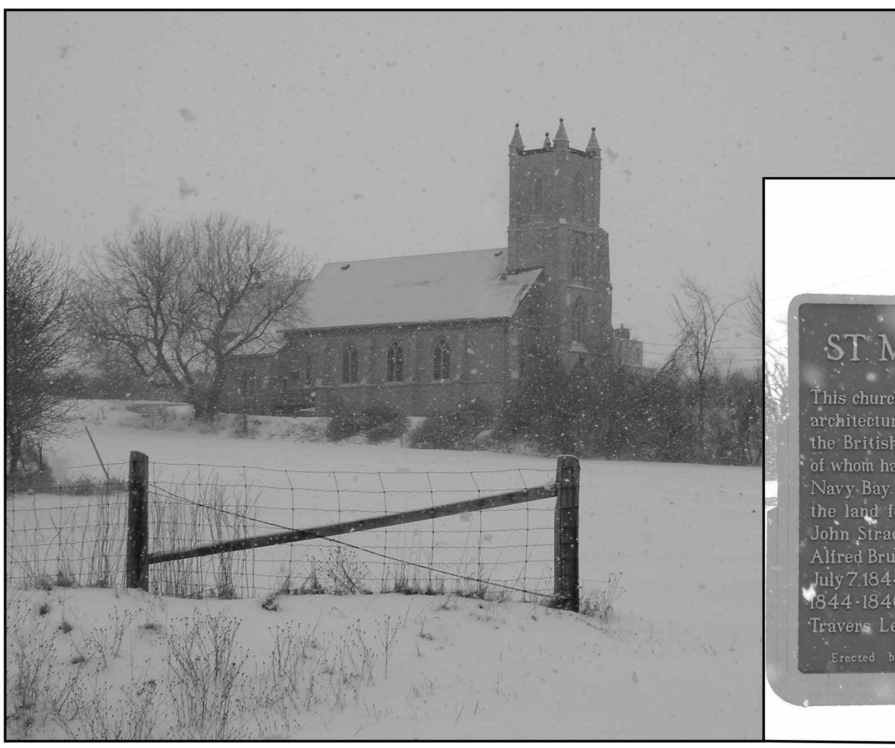
References:

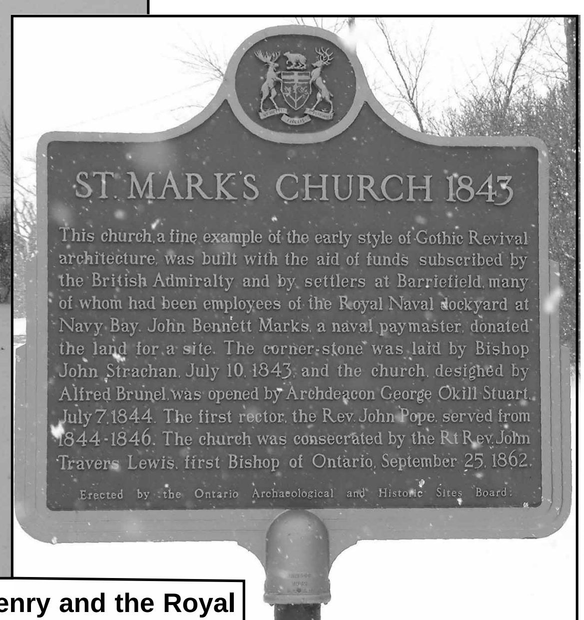
1. Correspondence from Ray Dallimore, December 10, 2000.
2. DHH 81-520-1000-910, Vol. 2 (1945-1959) "Press Release – Supply and Secretariat Branch."
3. Naval Board Minutes, October 19, 1948.
4. DHH 18/20/1000/910 Vol. 2 (1945-1959), "Brief for CNS on Supply Branch – Scope of Duties."
5. It is worthwhile to note that in Newfoundland the Base Naval Stores Office (BNSO) established during the Second World War was a fully naval organization, but that practice ended with its closure at war's end.

Cdr Mark Watson is the Formation Administration Officer at Maritime Forces Atlantic Headquarters in Halifax. His book, "Sea Logistics – Keeping the Navy Ready Aye Ready," *was recently released from Vanwell Publishing.* *(See a review on page 18.)*

Lasting Logistics Landmark

by Bridget Madill and Brian McCullough





Photos by Brian McCullough

On a high point of ground across the way from Old Fort Henry and the Royal Military College in Kingston, Ontario, a 162-year-old limestone church bears the "mark" of a 19th-century Royal Navy paymaster. St. Mark's Anglican church in the historic village of Barriefield was built in 1843 on an acre of farm land donated by John Bennett Marks, paymaster of the Royal Navy dockyard on the St. Lawrence River at nearby Point Frederick on Navy Bay.

Book Reviews

Sea Logistics — Keeping the Navy Ready Aye Ready

Reviewed by Cdr Hugues Létourneau

Sea Logistics — Keeping the Navy Ready Aye Ready
by Commander Mark B. Watson
Vanwell Publishing Limited
(sales@vanwell.com) © 2004
ISBN 1-55125-081-0
276 pages, illustrated, indexed
$44.95

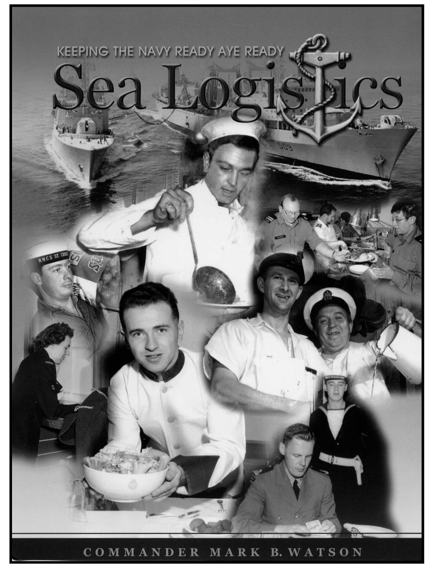
Sea Logistics is one of those books that should have been written long ago, but wasn't. Engineers can relate: the story of the non-MARS branches doesn't get told very much — probably because the rest of us haven't told our stories all that much. But no matter.

Cdr Mark Watson, a Sea Logistics officer, paints a comprehensive, thorough portrait of all aspects of the branch, from the RCN's inception in 1910 to today's post-9/11 world. All trades are covered, all important milestones are carefully noted and the book is clearly and sequentially ordered. Watson set out to provide the definitive book where none existed, and in this he has succeeded.

And here I must declare a small conflict: Cdr Watson consulted me on the Naval Reserve parts of this book, so please forgive me when I tell you the author got it right when he wrote *Sea Logistics*, since it appears he carried out careful research and consulted his sources extensively.

Watson is as consistently informative as he is entertaining. It may surprise some to learn that in the late forties the RCN, tired of a Royal Navy-type supply system that no longer met the needs of a modern North American navy, turned to the United States Navy to modernize its supply system. Watson also describes how the present-day naval supply branch made key innovations in forward logistics support during the first and second Gulf Wars — thinking "outside the box" to find better ways to serve the most extensive Canadian naval deployments since Korea.

Perhaps Watson's even bigger accomplishment is that he has actually produced something that is so interesting and easy to read. That the text is liberally sprinkled with humorous anecdotes (a sidebar format he calls *On the Lighter Side*) just helps to make this book a delight.



Sometimes we need to remind ourselves that our navy does quite a few things right. In what is clearly a labour of love, *Sea Logistics — Keeping the Navy Ready Aye Ready* tells us about some of those things from a sea logistician's point of view. I only wish all our naval histories were this good.

Cdr Létourneau is a Sea Logistics officer, and is Chief of Staff, Policy and Procedures at Naval Reserve Headquarters in Quebec City.

Ugly Ducklings: Japan's WW II Liberty Type Standard Ships

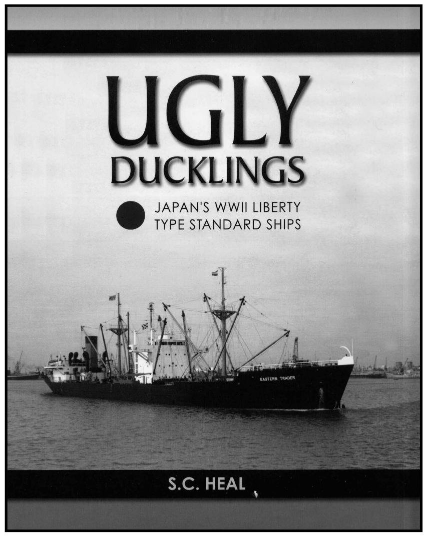
Reviewed by Lt. Cdr. A.J. Whatley, RCNC

Ugly Ducklings: Japan's WW II Liberty Type Standard Ships
by S.C. Heal
Vanwell Publishing Limited
(sales@vanwell.com) © 2003
ISBN 1-55125-057-8
180 pages, illustrated, indexed $32.95

The Liberty ships produced by the Allies during the Second World War have been the subject of numerous books, and the role they played in the victory has been well recorded. Information about the non-naval shipping built by the Axis powers, and Japan in particular, however, is not readily available. It is therefore very refreshing to come across a book like *Ugly Ducklings* which accurately details the minutiae of this poorly understood area of maritime history.

Author Syd Heal provides a history of Japanese commercial shipbuilding, set within the context of the immense changes that happened to this essentially "closed" country from the mid-19th century to the post-WWII era. The author's personal experiences in the Royal Navy in the Far East add an extra dimension to what could have been a dry book about a very esoteric subject. The widespread and well-publicized atrocities carried out by the Japanese Imperial forces are balanced here by anecdotes that show a better side did exist, and the book helps the reader to better understand the reasons behind the mindset prevailing in Japan during the wartime period.

A wealth of detail is provided about the Japanese Liberty-type ships, from their design and build using prisoner-of-war labour (which backfired when the rivets used were deliberately undersized, leading to leakage and structural weakness), to



a complete listing of how these ships ultimately ended their lives. The detail is complimented by a surprising number of photographs (considering the age and rarity of the vessels) which show the development of these ships from the pre-war, unclassed "jerry-built" examples, to the relatively good-looking cargo liners that helped in the post-war recovery of Japan.

This book is a highly recommended read as it provides excellent insight into Japanese social and maritime history around the time of the Second World War.

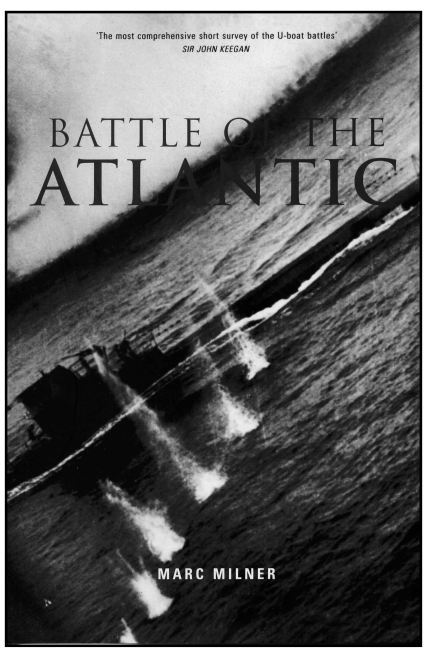
Lt.Cdr. Alexander Whatley is a Royal Corps of Naval Constructors exchange officer in the DMSS 2 Ship Systems Engineering section of DGMEPM. He is the subsection head for stability and hydrodynamics.

Battle of the Atlantic

Reviewed by Brian McCullough

Battle of the Atlantic
by Marc Milner
Vanwell Publishing Limited
(sales@vanwell.com) © 2003
ISBN 1 55068 125 7
255 pages, illustrated, indexed
$39.95

If you are anything like me, your idea of Canada's contribution to the 1939-45 Battle of the Atlantic probably runs true to the national consciousness — a National Film Board picture of brave Allied merchantmen and plucky little escorts holding the U-boat packs at bay in a heroic defence of the Mother Country. Some of us with sailoring in our blood might see the darker images behind such a sepia-toned story of



North Atlantic convoy life...the seasickness, the constant fatigue, the madness of a convoy under attack...it's what we learned or may even have experienced, after all. But is this the real story?

That's a question naval historian Marc Milner might respond to with a convincing "yes and no." In his book, *Battle of the Atlantic*, Milner has no difficulty with Canadian national pride in a job well done, but he challenges our traditional Anglo-centric view of the six-year conflict with a compelling "mid-Atlantic" analysis of the war at sea. Billed as "a major reinterpretation of the most important military campaign of the Second World War," *Battle of the Atlantic* presents a clinical, unvarnished assessment of the battle for control of the Atlantic sea lanes.

Milner, a professor of history at the University of New Brunswick and a well-respected author (*North Atlantic Run*, 1985; *The U-Boat Hunters*, 1994), pulls no punches in his candid appraisal of Allied and German strengths and weaknesses. What becomes patently clear from Marc Milner's text is that, despite some tense moments for the Allies, Germany was never really in a position to secure a lasting victory in the Atlantic. The *Kriegsmarine*, he contends, was fighting a technology battle it could not win.

"The race in 1942 was to see who could learn the quickest," Milner writes. Pointing out that it was only toward the end of 1943 that Grand Admiral Karl Dönitz's finally established a Naval Scientific Operations Staff, Milner suggests that "Such a staff, a hallmark of the Allied system for years, was long overdue."

Apart from the book's fascinating technical thread, what I found most engaging was Milner's discussion of the complex issue of multi-nation command and control over Allied naval and merchant assets. The British/Canadian mantra of ensuring the "safe and timely arrival" of convoys was completely at odds with the USN's priority to prosecute and kill the enemy. This created difficulty later in the war when the Royal Canadian Navy was placed under American operational control in the northwestern Atlantic. The autocratic USN would not even permit Canadian naval authorities to pass urgent operational intelligence to RCN units working beyond Canada's three-mile territorial limit. This irritating "technicality" was routinely disregarded by naval headquarters in Ottawa.

What this all boils down to is that historian Marc Milner has crafted an interesting, unconventional account of the epic battle for the Atlantic. If you haven't already read this fine, well-illustrated book, what better time to do so than during the 60th anniversary of the end of the Second World War. *Battle of the Atlantic* is one naval history you won't want to miss in your study of Canada's war at sea.

Brian McCullough served 25 years as a navigation officer in Canada's naval reserve. He is currently the production editor of the Maritime Engineering Journal.

Guidelines for Book Reviewers

The *Maritime Engineering Journal* is always on the lookout for upbeat, positive reviews of recently published naval/nautical books that you would recommend to other readers. Reviews should be about 250 words in length, and should generally tell us:

- what the book is about
- how well the author did with the work, and if there are any minor drawbacks
- what you like best about the book [This should be the main focus of your review];
- whether the illustrations work well;
- whether there are any particular groups to whom the book might appeal.

Please include the following book information with your review:

- Title
- Author
- Publisher
- Date of publication
- ISBN
- Number of pages
- Also mention whether the book contains photos, illustrations, glossary, bibliographical references or index.
- Send us a high-resolution scan of the dust cover if possible

Reviewers are encouraged to express themselves creatively, and in their own words. There is nothing wrong with grabbing a phrase from the dust jacket and attributing it by saying something along the lines of, "This book is billed as...," but for the most part we want your opinion in your own voice.

Feel free to contact me if you care to discuss a potential review. Happy reading!

Brian McCullough
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E-mail:
McCullough.BM@forces.gc.ca

News Briefs

Orca Training Vessels

A contract has been awarded to Victoria Shipyard Co., Ltd. of Victoria, British Columbia to construct six training vessels to be used for basic naval training on the West Coast. The new steel-hulled vessels, designated the *Orca* class, will replace the wooden-hulled Yard Auxiliary General (YAG) training vessels built in the 1960s.

The 33-metre *Orca*s will have a top speed close to 20 knots and a range of 750 nautical miles at 15 knots. Vessel complement will consist of four crew and 16 trainees, with provision to accommodate mixed gender crews and trainees. There will also be classroom and briefing spaces, and a state-of-the-art bridge featuring GPS, radar and electronic charts.

Image courtesy of Victoria Shipyard Co. Ltd.

Junior officers and others have learned their basic seamanship and navigation skills in YAGs for many years. The twin-screw *Orca* vessels continue that tradition of West Coast training, but in a modern platform more closely resembling the warships for which the trainees are preparing.

Delivery of the first vessel is expected in 2006, with the final vessel slated to be delivered in late 2008. The government holds an option to purchase two additional vessels. — **Ken Grandy, Project Manager YAG Replacement Project, Ottawa.**

Order of Military Merit Appointments


Photo : Rideau Hall

Capt(N) Rick Payne receives his medal from Governor General Adrienne Clarkson

Navy technical officers Capt(N) Richard Payne and LCdr Christopher Hargreaves have been appointed officers of the Order of Military Merit. The awards were made by Her Excellency the Right Honourable Adrienne Clarkson, Governor General of Canada, in a ceremony at Rideau Hall on Nov. 9, 2004.

Capt(N) Payne was cited for his many years of dedicated, professional service. Over the past two decades he has been at the forefront of every major warship and submarine project to transform and modernize the Canadian navy. From 1985 to 1987 he commanded a detachment in Saint John Shipbuilding Ltd., overseeing the HMCS *Annapolis* destroyer life-extension refit, then remained in Saint John as Quality Assurance Officer with the Canadian Patrol Frigate leadyard detachment (*MEJ September 1988*). From 1989 to 1993 he served as the shipyard detachment commander for the Tribal-class Update and Modernization Project (TRUMP), and was closely involved in the renegotiation of the TRUMP contracts in 1990.

In 1993 Rick joined the Maritime Engineering and Maintenance division in Ottawa as Class Manager Submarines, responsible for the in-service support of Canada's *Oberon*-class submarines. He also directed the Submarine Capability Life Extension Project, mandated to explore options for renewing Canada's submarine fleet. In 1998 he led an accelerated effort to finalize negotiations and obtain Treasury Board approval for Canada to acquire four British *Upholder* submarines.

From 1999 to 2003 Capt(N) Payne served as Commanding Officer Fleet Maintenance Facility *Cape Scott*, with concomitant responsibilities as Chief of Staff for Naval Engineering and Maintenance. This appointment included the preparation and support of nine Op Apollo warship deployments, the Canadianization of the first two *Victoria*-class submarines, the resurrection of an apprenticeship program, and the commissioning of the Commander Anthony Law Combat System Repair Facility.

Captain(N) Payne currently serves as Chief of Staff for Maritime Forces Atlantic. He is also pursuing part-time graduate studies toward a masters degree in public administration (management) at Dalhousie University in Halifax.

News Briefs

LCdr Chris Hargreaves, a naval architect with wide experience, was cited for his leadership, dedication to service, and excellence as an authority on warship design and maintenance at the national and international levels.

While at the Naval Engineering Unit Pacific in 1991, LCdr Hargreaves was instrumental in preparing West Coast naval ships for deployment to the Persian Gulf in support of Operation Friction (*MEJ June 1992*). During an exchange posting with the U.S. Navy in the mid-1990s, Chris was honoured with the United States Navy Commendation Medal for his initiative in developing a costing model that was adopted by the USN's Sealift Program. He also received a performance citation from his divisional commander, recognizing him as "A superior Naval Officer, an outstanding Naval Architect and a consumate ambassador of the Canadian people."

Back in Canada, LCdr Hargreaves developed a successful structural certification program for Canadian warships, and took the initiative to develop hull corrosion and crack monitoring programs for the *Halifax*-class frigates. An innovative decision-making process developed by him has resulted in considerable cost savings associated with vessel work periods, and greater operational availability of Canadian warships.

Thanks to his structural expertise, LCdr Hargreaves has been called on time and again to provide expert technical opinion on high-visibility technical projects, including the investigation into the origin of a dent in the pressure hull of HMCS *Victoria*, and prequalifying the *Halifax*-class hangar and flight-deck structure for all aircraft contenders in the Maritime Helicopter Project. He also served as the Canadian head of delegation to the NATO Naval Armament Group on Warship design, a position normally represented at the rank of Captain(N).

Most recently, LCdr Hargreaves served as chief naval architect for the Frigate Life Extension Project. He is currently attending the Canadian Forces Command and Staff College in Toronto.

Congratulations to both of these deserving naval officers.

Photo : Rideau Hall

LCdr Chris Hargreaves receives his medal from Governor General Adrienne Clarkson

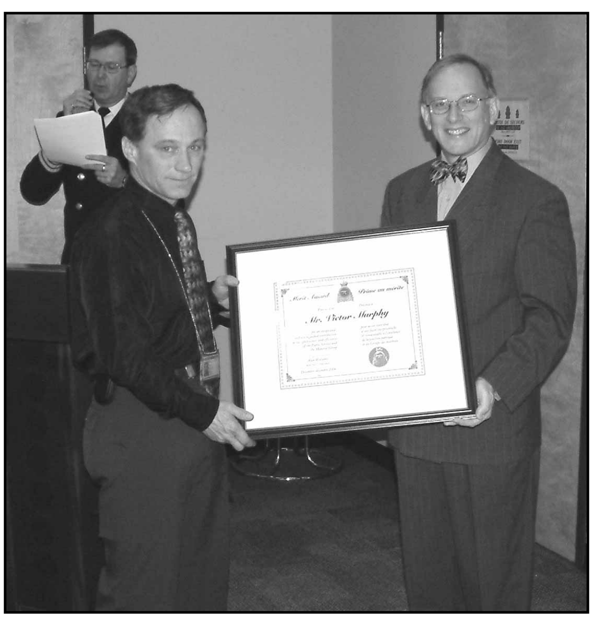


Photo by Brian McCullough

ADM(Mat) Merit Award

Vic Murphy receives an ADM(Mat) Merit Award from Mr. Alan Williams, Assistant Deputy Minister for Materiel, for his outstanding dedication and initiative in advancing the Maritime Materiel Acquisition and Support Information System (MASIS) Acceptance Project. Mr. Murphy, a retired naval petty officer, is the life-cycle materiel manager for naval environmental equipment in the marine auxiliary section of the Directorate of Maritime Ship Support. His contribution to the implementation of a consolidated area repository proved critical in bridging the materiel management capability "delta" between MASIS and the CF Supply System Upgrade.

ADM(Mat) Merit Awards

Photo by Brian McCullough

Adm(Mat) Alan Williams with Merit Award recipients Cdr R.J. Hovey, Cdr R.W. Jones, Cdr M.D. Wood and Cdr B.W. Carter. (Missing is LCdr Buxton)

Cdr Brian Carter, Cdr Robert Hovey, Cdr Robert Jones, Cdr Mike Wood and LCdr Derek Buxton received ADM(Mat) Merit Awards for their outstanding support to the *Victoria*-class submarine project.

Cdr Carter has served the past six years with the U.K. PMO detachment of the Submarine Capability Life Extension (SCLE) Project, first as engineering manager, then detachment commander. He played a leading role in representing Canada's interests during the reactivation of the *Victoria*-class submarines in the UK shipyard.

Cdr Hovey has served the past two years as Director Maritime Class Manager Submarines in DGMEPM. He has been instrumental in introducing the Canadian submarine material certification process.

Cdr Jones is head of the auxiliary systems section in the Directorate of Maritime Ship Support. He was cited for his technical leadership relating to technical issues surrounding the introduction of the *Victoria*-class submarines, notably problems with the diesel-generator exhaust hull valves.

Cdr Wood has served the past three years as Formation Technical Authority in Maritime Command Atlantic, a key link in the submarine dialogue between PMO SCLE, DGMEPM and coastal engineering and operational authorities. He personally oversaw submarine dockings and the Canadianization work periods.

LCdr Buxton has been the DGMEPM *Victoria*-class in-service manager for the past three years, providing outstanding support to major work activities for the submarines. He successfully led an interdisciplinary team to tackle the issues of replacing the diesel exhaust hull valves in HMCS *Victoria*.

Cleaning House?

The Canadian Naval Technical History Association is working hard at preserving Canada's naval technical heritage. If you are planning to dispose of any unclassified/declassified naval technical documents, drawings, videos, or other material you think might have historical significance, please contact Warren Sinclair, Acting Chief Archivist with the Directorate of History and Heritage in Ottawa. Arrangements will be made to examine your material, and steps will be taken to preserve whatever may be historically significant. Warren Sinclair can be contacted at (613) 998-7060. Thank you for doing your bit to preserve Canada's important naval technical historical record.

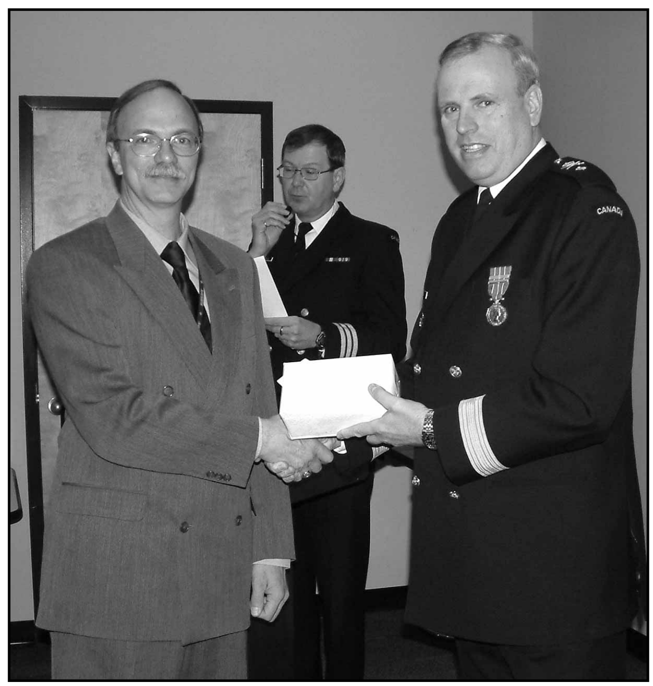
Photos by Brian McCullough

CMS Letter of Commendation

Chief Petty Officer First Class Denis Chitouras received a Chief of the Maritime Staff letter of commendation in recognition of his outstanding career in operational submarines. He currently serves as the submarine system design authority for escape and rescue. Over the past two years CPO1 Chitouras has been instrumental in overhauling submarine escape and rescue policy, and investigating and correcting deficiencies in these systems. Cmdre Roger Westwood presented the letter to CPO1 Chitouras in February.

DGMEPM Special Award

Stuart Brink, an electronic technologist with the Directorate of Maritime Ship Support section for above-water warfare sensors and weapons, received a DGMEPM Special Award in February for his outstanding work as project manager of the Seasearch Electronic Support Measures Project. The Seasearch project procured and installed ESM receiver systems designed to acquire, process, characterize, identify and provide direction of arrival of various signals of interest in a modern maritime signal environment.His effort on matters relating to intelligence and project programmatics was also recognized in a letter of appreciation from the U.S. National Security Agency.



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If you would like to change the number of copies of the *Journal* we ship to your unit or institution, please fax us your up-to-date requirements so that we can continue to provide you and your staff with the best possible service. Faxes may be sent to: **The Editor, Maritime Engineering Journal, DMSS (819) 994-8709.**

National Defence Défense nationale

WINTER (MARCH) 2005

News

CANADIAN NAVAL TECHNICAL HISTORY ASSOCIATION

Canadian Naval Defence Industrial Base Project

The CANDIB committee actively continues its mission to gather and document as much historical information as possible on naval ship and equipment programs since 1930, and the effect they had on Canadian industry. We are trying to find people who were part of this developmental activity, calling on the experience and recollections of as many people as possible.

As we reported in our last issue of *CNTHA News*, CANDIB has established an oral history project with the generous support of the Directorate of History & Heritage. The committee has now acquired audio recording equipment, and has already begun conducting interviews in the Ottawa area. Plans are to continue interviewing in Ottawa and on the two coasts over the next few months. We are very interested in hearing from persons who may have appropriate experience in Canadian naval-industrial relations and would like to be considered for interview. We are also eager to hear from people who might wish to conduct interviews on behalf of the CANDIB committee.

We were honoured recently to receive a number of FHE-400 manuals, photographs, reports and drawings from **Tom Armstrong Bennett**. During the 1960s Tom was a key member of the 11-man engineering team at de Havilland Aircraft in Toronto that designed the ocean-going hydrofoil HMCS *Bras D'Or*. Tom and his wife **Joan** met with the CANDIB committee on October 14 to donate the documents to the Canadian Naval Technical History Association archive collection. Tom kindly agreed to speak about his experiences with the hydrofoil project, and to allow us to record his story for posterity. He was the first person to be interviewed for the CANDIB oral history project. (See article next page.) A verified transcript of the interview will soon be available on the website indicated below.

Please visit us at http://www.cntha.ca/CANDIB.html. We will be posting our progress on it periodically and will be expanding the website on a continuing basis. Anyone who would like to learn more about CANDIB is invited to contact Tony Thatcher by phone at (613) 567-7004 ext 227 or email: tony.thatcher@snclavalin.com

— Tony Thatcher, CANDIB Committee Chairman

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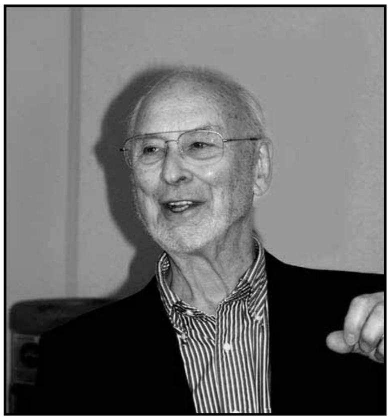
CANDIB's First Oral History Interview:

Tom Armstrong Bennett remembers the Anti-Submarine Hydrofoil Vessel, HMCS *Bras d'Or*

by Don Cruickshank



Tom Armstrong Bennett

The CANDIB historical research project moved a further step ahead in mid-October 2004 as Tom Armstrong Bennett, one of the 11 members of the former de Havilland Aircraft hydrofoil development project, became the first volunteer to participate in the recently launched oral history interview program.

Tom and his wife Joan met with the committee at the request of CANDIB Chairman Tony Thatcher. Tom brought with him not just a wealth of his own recollections, but also a treasure trove of documents and photographs illustrating many of the fascinating aspects of the FHE-400 design. Using his papers, he illustrated many of the challenges that were encountered as the operating envelope for this first-of-type vessel was pushed beyond the limits of previous experience.

Interview chief Douglas Hearnshaw and his CANDIB colleagues had prepared a set of questions, the answers to many of which were found in the boxes of literature Tom salvaged when the program was abandoned in 1972. He generously turned this material over to the CANDIB team for deposit with the DND Directorate of History and Heritage, where it will be catalogued, stored, and made available to historians of the future.

The CANDIB committee could have spent hours delving into the *Bras d'Or* program and its unique design and fabrication peculiarities. A comprehensive record of the lessons learned and experience gained in the sometimes frustrating battlegrounds of design, testing and building this unique vessel will now be on record and available for reference by engineers and historians.

That is the central objective of the oral history project, and there could hardly be a better example of its value than this first interview. To all of you readers who have old materials in your basement, or valuable memories that could add to the storehouse of information about interesting aspects of Canadian naval design and development activities: please get in touch and make arrangements to pass it on, either in writing or by participating in the oral history interview program. The particular focus of the CANDIB committee's research is, of course, on activities that have had an impact on Canadian industry.

For further information contact Douglas Hearnshaw at (613) 824-7521 or at dhearnshaw@trytel.com