“Make all levels of Government and the general public clearly aware of the vital need for, and value of adequate and effective Maritime defence forces to protect and further the interests of Canada.” (Branch Bylaw No. 3)
Dear Branch Members,

As your relatively newly minted Branch President, I am pleased to report that I am settled in and thoroughly enjoying the work with my fellow directors in advancing the objectives of the Naval Association of Canada – Ottawa Branch. It is certainly an interesting time for our Association as we welcome the new Federal Government and learn more of their priorities and perspective.

I will use this occasion to report on some important developments that your Board has advanced within the past several months and flag key activities on the horizon. Some of these future activities may be completed by the time you read this edition of Soundings.

Unquestionably we are in a busy and challenging period for the Royal Canadian Navy (RCN), the Canadian Coast Guard (CCG), and Defence and Security in Canada. The recapitalization of the Federal Fleets within the context of the National Shipbuilding Strategy (NSS) is entering an important phase of execution. Recently the Government announced the appointment of an Expert Advisor to the NSS to help guide ministers in making progress on the commitments within the strategy. Also on 6 April the Minister of National Defence announced the process for the Defence Policy Review and the naming of the four-person Ministerial Advisory Panel. On these issues you will be aware of some of the initiatives the Association is advancing under the NAC National leadership. Our National President, Jim Carruthers, in his most recent Starshell article From the Bridge, defined the current effort and explained the messaging and approach. He articulated the NAC Master Message – Canada Needs a Capable and Effective Navy; the eleven Key Messages underlining the Master Message; and how this will be advanced in the Written and Spoken Word. We have all been issued the challenge as NAC members to get personally involved in advancing our message. In the May edition of STARSHELL, I know the National President will update the initiatives that are underway and the progress being made.

The 22 March Federal Budget provided insight into the Government’s priorities and spending plans. The amount of ink devoted to defence and security matters was sparse with only an oblique reference to the deferral of major project spending. Let us hope this Defence Policy Review achieves its objectives of defining what is needed to confront new threats and challenges in the years ahead.

As reported previously, your Board comprises a healthy mix of veterans and newbies, and I am pleased to report it did not take long for the group to meld and start working well together. You can see this through the varied and interesting speaker roster at our monthly meetings, and in the enthusiasm displayed in managing some of our major activities. As approved at our last
Branch Annual General Meeting in June 2015, the Branch has two major activities on our plate this year. Both are cannot fail missions and they are advancing well through our volunteer groups.

Two specific issues that the Board has tried to address this year concern expanding our base of volunteers and broadening and diversifying our membership. Our success in the former is laudable and on the latter we still have some work to do. I want to acknowledge the outstanding work of all of the volunteers who are working so hard on the core and special events within the Ottawa Branch. In particularly to recognise the excellent support being provided to and by Tim Addison and Barry Walker and their Battle of Atlantic Gala committee, Nick Leak in managing our participation in ceremonies and parades, and to those that are supporting my sub-committees on the October events in Ottawa. Finally, I must recognise the ongoing fine efforts of Bob Bush who keeps the National and Ottawa Branch web sites in very good nick. Additionally Bob has reached out and is supporting other NAC Branches which are starting or increasing their web presence.

That said, there is always room for more hands and if you can offer your time, expertise, and energy, I promise there is much work still to be done. Some of the work is prestigious and strategic, some less so – but all is vital to success. Please consider this request to volunteer as the need is there. If you wish or need more information, I would be pleased to address your questions or concerns.

In terms of broadening and diversifying our membership, we have a challenge. Our Membership Director, Steve King does an outstanding job in keeping our membership efforts focussed and our overall numbers remain very strong, The Branch is growing with many younger members onboard. While this is a good news story, we cannot be complacent. Your Board has wrestled with how we can better attract more women to the Branch, recruit new members from among those serving in the RCN, including within the Naval Reserve, both at the officer and non-commissioned levels, break through with the CCG, and better reach out to non-commissioned members who are retired and residing within our community. To date we have not yet cracked this nut. Your Board has some ideas but we certainly do not have a patent on the solution. Again, we would welcome suggestions from across our membership and I would encourage any useful ideas to be brought forward to my attention. We are willing to try anything that is reasonable and appropriate.

Looking ahead to the calendar I would ask you to note our Super Wednesday Event on 20 April at noon at HMCS BYTOWN. This event provides a great opportunity to renew acquaintances and check in with colleagues and friends. Please plan to attend with your spouse, partner or friend for an opportunity for an enjoyable social event. Additionally, the Battle of the Atlantic Gala is approaching on Thursday 28 April 2016, and will be followed by the Battle of the Atlantic parade and national ceremony on Sunday the 1st of May. This year The Battle of the Atlantic parade will take place on Parliament Hill, as the National War Memorial is under repair. Finally please take note that the Ottawa Branch is hosting the NAC Annual General Meeting (AGM) and Conference in Ottawa on Thursday 20 October 2016 (Conference), and on Friday 21 and Saturday 22 October 2016 (AGM).

I would also wish to preview that our Branch AGM will take place on the evening of Monday 6 June 2016 at HMCS BYTOWN. The AGM is an important event as it permits the membership to receive reports from the Board on the overall health of the Branch, the progress on specific issues, and facilitates discussion and approvals to advance the Branch’s mandate. This year the membership will be receiving several new and unique reports that fulfill the Board’s obligation under the Not-for-Profit Corporations Act. The AGM also permits an opportunity for those who want to serve on the Board to bring forward their application and be considered for approval by the membership. Please look forward to receiving reports and supporting documentation in the weeks ahead to permit your attendance and participation in the AGM.

Remember Branch members can also propose nominees for the Board, or introduce a resolution to be voted on, using the procedures in our by-laws. The Bylaws may be located on the
web page (see link). If you cannot attend in person our bylaws allow for proxy voting. I will forward information on the proxy process closer to the AGM.
http://navalassoc.ca/branches/ottawa/governance/

I wanted to highlight the efforts of our Salty Dips Committee under the leadership of Richard Guitar. Plans are underway for Salty Dips – Volume 11, which will establish a theme of ‘How Life in the Navy Has Changed Since the 1950s’ and is targeting a publication date in late 2017. The campaign for potential stories for this edition is underway and if you are interested in contributing or think you may have a ditty (or two), please contact Richard at: rrjguitar@rogers.com.

Let me conclude by wishing you the very best this Spring and Summer.
Yours Aye, Howie Smith

Branch Membership
By Steve King

The membership of the Ottawa Branch is estimated at 464. Membership renewals are still underway, so the total overall trend over the past and steady. Sixteen new ranks since the start of this interest amongst the Naval significant increase. We have 12) from the rolls due to health, moving, or just plain of our members crossed the already lost three more this commemorated at:
http://navalassoc.ca/branches/ottawa/crossed-the-bar/.

At the time of this writing, there remain about 60 who have yet to pay their dues for 2016. Those individuals are urged to signal their intentions to me at their earliest convenience. Meanwhile you continue to receive benefits, such as Soundings and Starshell, at a cost to the NAC. Information on and ways of membership application can be found on the web site at navalassoc.ca/branches/ottawa/joining & membership renewal.

If your address or email has changed, please let me know at naco.membership@gmail.com. Contact information is used for postal mailings and emailing, both by the Branch and NAC National. Whenever we distribute Soundings or Starshell, or when a “Branch GEN” is sent by email to advise you of news and upcoming events, we invariably discover that some of the addresses are incorrect.), or if you don’t have a computer, kindly call me or advise me by mail whenever any of your contact information changes. It will ensure that you are kept informed, and can stay in touch with other members.

<table>
<thead>
<tr>
<th>Membership</th>
<th>For those interested in numbers:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2013</td>
</tr>
<tr>
<td>Honourary/Life Paid Members</td>
<td>80</td>
</tr>
<tr>
<td>Civilian/Retired Members</td>
<td>224</td>
</tr>
<tr>
<td>Serving Members</td>
<td>22</td>
</tr>
<tr>
<td>Spouses</td>
<td>7</td>
</tr>
<tr>
<td>Introductory Members</td>
<td>22</td>
</tr>
<tr>
<td>Naval Cadets (at RMC)</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>355</td>
</tr>
</tbody>
</table>

S

Soundings May 2016
DEFENCE REVIEW OR DEFENCE REDUX?

By Howie Smith

On 6 April the Minister of National Defence announced that the Government of Canada will undertake a Defence Policy Review (DPR) that is notionally to be completed by the end of 2016. With this announcement came the release of some detailed background information to guide the review along with an explanation of the process to allow all Canadians to participate. Further in a recent feature interview with the Canadian Defence Review, Minister Sajjan noted this review would culminate in a Defence White Paper. He also observed in several other recent interviews that the DPR must not be a compilation of ideas on paper alone but actually needs to take cognisance of the current situation facing Canada, meets Canada’s current and future needs, and perhaps most critically, explains how it is to be funded. All sound goals and certainly an ambitious exercise for the new Government and the Minister.

Given that a full DPR has not been completed in over twenty years, Canadians of all views have been presented with a glorious opportunity to contribute to and influence an important national policy. The Minister himself noted that the DPR must serve Canada for the next 20 plus years and that it needs to be grounded and in line with Canada’s foreign policy objectives. As we advance on this voyage of consultative policy development, separate from the broad policy statements defining the anticipated mission and roles of the Canadian Armed Forces, there are some important features that I will be looking at closely. These features will help me determine if indeed Canada’s needs are being met and, as importantly, how this will be accomplished. I share these features with you and welcome any comments or feedback.

Feature - Consultation

The Government has committed to conduct consultations with Canadians in line with their general aspirations for a more open, transparent and consultative approach to governing. This is refreshing and the DPR is scheduled to include visits to the regions, commencing with Vancouver in April. Also, the DPR is encouraging representation by associations, organised groups, experts, and individual citizens. The Government has also committed to consulting with Canada’s Allies and drawing lessons from comparable recent reviews in the United Kingdom and Australia. An important aspect to ensure this consultation is productive and well-focused is to assess the quality of the information that has been distributed in advance to frame submissions and presentations. The information released by the Government is certainly extensive and should be quite beneficial. It includes a section entitled The Security Environment – this is encouraging. However, what is lacking in setting the Security Environment is any apparent attempt to quantify the threats or place them in priority. This may lead to unfocused responses on critical Question #1 - Are there any threats to Canada’s security that are not being addressed adequately? This is a tough question for several reasons, as it assumes a common understanding of threat probabilities and priorities, which will be difficult to achieve. From my perspective what is also missing is real insight into Canada’s future foreign policy objectives given that there is no corresponding foreign policy review underway. To date Canadians are left to decipher Canada’s foreign policy priorities from speeches and interviews with Minister Dion and this makes it difficult to comprehend overall Government intent and aspirations.

Feature – Canada’s North and Arctic Defence

The Government’s platform examined Canada’s North from the perspectives of economic development and plans to address the region’s high cost of living. These are sound objectives and deserving of higher priority. However, at the time little was provided in terms of what priority Canadian sovereignty in the North will enjoy, or what is planned for Arctic defence and security. The DPR consultation paper mentions the heightened international interest in the Arctic and recent Russian activity. Nevertheless, beyond a broad commitment to increase Arctic surveillance and control (with no indication of how or with what capabilities) and to expand the size of the
Canadian Rangers, little has yet been presented. Budget 2016 did not address this area as a priority. Something articulating the importance to be placed by the Government on Arctic defence and security would have been most instructive for the DPR. It needs to be fleshed out in the DPR to ensure a credible and realistic policy is articulated.

**Feature - Asia-Pacific**

In the Government’s platform there was no specific mention of any concerns respecting the changing security landscape in East Asia or with the recent military developments in China that impact her immediate neighbours. Beyond tepid overall support for the Trans-Pacific Partnership and ambiguous statements by International Trade Minister Freeland indicating that Canada will sign the agreement but not necessarily ratify, it is hard to understand what priority the Asia-Pacific region enjoys. The DPR consultation paper notes that there are geopolitical rivalries and disputes in the Asia-Pacific region but offers nothing on what importance these disputes are to Canada. What are Canada's national interests here? Whether Canada accepts that there are security and defence issues brewing in this region that affect us directly and indirectly will be a fundamental outcome in my view. This feature of the DPR is particularly important as navies have and are playing a vital role in the changing security landscape in this region.

**Feature - United Nations Engagement**

The new Government has established re-engagement with the United Nations and increased support to peace support operations as priorities. The feature I will be looking at closely is what is expected of Canada's Armed Forces and how will this re-engagement take place. In this context, it will be most relevant to learn if the past prominent role played by Canada's Navy in support of United Nations Security Council Resolutions and operations under Chapter 6 or 7 of the Charter is recognised and acknowledged as important. Should the DPR focus exclusively on preparing for operational missions that require boots on the ground from blue helmeted land forces, this will be a both a shortcoming and a lost opportunity that could leave Canada constrained in responding to future operational circumstances.

**Feature - Surveillance and Capability Assets**

Unquestionably one would expect that the Defence of Canada and maintenance of sovereignty to emerge as critical elements of the DPR. Within this element, I will be looking closely at what capabilities are to be maintained or enhanced to fulfill this role. Will Canadian sovereignty protection provide appropriate recognition of the maritime security threats or be more limited to aerospace threats to North America and internal threats posed by terrorist groups? Will the proliferation of new submarines in many of the world’s trouble spots be recognised by the review as important and having an impact on Canada? In view of the investments being made by Canada’s closest allies to address these threats, what does it mean to future manned and unmanned air and naval (surface and subsurface) platforms that defend Canada and maintain our sovereignty? More specifically, will the review articulate a future for submarines in Canada with specifics as to how this capability will be maintained? Additionally, when examining the reordered priorities from 2015 Strategic Defence and Security Review in the United Kingdom, will this invite a re-examination of the emphasis being placed on Canadian maritime patrol assets? I hope that this receives critical analysis and study. A roadmap that is clear and unambiguous is highly desired. If it is not, we could be embarked on a path that leads to losing our submarine and maritime patrol capabilities.

**Feature - Affordability**

While it is naïve to hope that the DPR will follow the Australian example of seeking considerable outside and independent analysis of the overall affordability of their new policy (2016), it is very important that Minister Sajjan has established that a necessary outcome is how Defence is be funded. While the 18 months or so devoted by Australia to completing a cost-assured and externally-validated Defence Plan is noteworthy, it is likely of more value politically as opposed to practically. No such activity can be completed in Canada in the timeframe
established. Some have written recently, including a former Chief of the Defence Staff, that the only way to ensure the Canadian Armed Forces can maintain basic capabilities and invest properly in necessary capital equipment is to look closely at reducing personnel levels and infrastructure in Canada. I will be looking for some telltale signs in the DPR that this is recognised and that the current allocation in the Defence Estimates (2016-17) of only 18% to Capital is insufficient. Equally, I will observe with interest whether the Government demonstrates the courage to look at the large and unnecessary number of headquarters, bases, stations and wings we have in Canada for such a modest force, and re-visits the current target personnel levels. Without this critical examination the percentage of the overall Defence investment devoted to capital equipment and force development priorities can only continue to diminish. We know well where this will lead.

Summary
The Government is to be congratulated for initiating an ambitious DPR early in its mandate. Canadians have been invited to participate, and let us hope they do. When we see the product of the review and study Canada’s new Defence White Paper we can look forward to the above features receiving prominence. Personally these features will help serve as my scorecard on how Canada’s Defence and Security needs are to be met, as we face the future in a world that is both dangerous and unpredictable. As we enter this ambitious task we should ask the question: Will the DPR truly examine the situation facing Canada today and bring about a renewal, or instead be a Defence Redux with recycled priorities employing just an updated version of previous policy statements? S

Salty Dips Progress
By Rick Guitar

We have received interesting material for Salty Dips Volume 11, and the promise of some more, but we still need contributions of stories, especially in later years. Our theme is how life in the Navy has changed from the 1950s until now. We would like to get all contributions in by the fall, and hope you can recall happenings from your past to entertain and enlighten the rest of us.

Volume 11 is tentatively planned for release in 2017, so as to be ready for the 150th Anniversary of Confederation. Any and all contributions are welcome, and if you feel that you can’t personally write your Dip, let me know at rrjguitar@gmail.com or 613-371-2171, and we will arrange an interview so that we can sit down with you and record your memories.

We plan to send copies of Salty Dips to all Commanding Officers and Coxswains in order to promote it, and hope they will take an interest and circulate it amongst their crews. We intend to include the CD for volumes 1 to 9 and a hard copy of Volume 10. It is hoped the CD will be very popular because e-books are apparently the fastest moving items in ships’ libraries.

As always, Salty Dips is a collection of stories, not an official history but the recollections of current and retired members of the RCN about their adventures and experiences at sea and ashore. The Dips cover almost all the history of the RCN from the Great War to the present. To move forward, we wish to expand the breadth of the tales collected and bring in more content from non-commissioned members, spouses and married service couples coping with the vagaries of deployments, home life, the good and the bad of the RCN’s impact on them.

Salty Dips is a record of RCN experience and we all have things that have happened to us, or were witness to events that are worth recording for posterity. Some are short and funny, some are long and less so. We look forward to your contributions and to be the first ones to enjoy reading them. S

Soundings May 2016
Guest Speakers

▲ Tim Page, Seaspan Marine, thanked by Branch President Howie Smith, 2 Nov 15

The presentation delivered by Tim Page of Seaspan updated the membership on developments at each of the shipyards within the Seaspan family and spoke to the successes and challenges to date. Tim provided an excellent overview of the Shipyard Modernization Project in North Vancouver and spoke to each of the projects within Non-Combat Package of the National Shipbuilding and Procurement Strategy. Tim also provided some detailed information on what Seaspan is doing to build the Canadian Industrial Base to support NSPS – some of the information is particularly germane to our Outreach messaging.

▲ CRCN, VAdm Mark Norman, thanked by Howie Smith, 30 Nov 15

▲ Mr Ric Elkington, BAE Systems, thanked by Branch Vice-President Tim Addison, 1 Feb 16

▲ VAdm Norman gave a State-of-the-Navy presentation that outlined the many facets of naval activities and the planning for the way ahead. He also mentioned the importance of NAC engagement in the education of the Canadian populace as to what the RCN can accomplish in support of Canada’s future.

▲ NAC-Ottawa Vice-President Tim Addison presents a copy of Salty Dips to Ric Elkington, the guest speaker on Monday February 1st. Ric is responsible for Business Development Naval Ships at BAE Systems, Ottawa, and he provided a very interesting description of BAE Systems achievements and of the Royal Navy’s Type 26 Global Combat Ship.
A Response to Gordon Smith’s Article on the DDH 280s

By Ed Healey

The article by Gordon Smith in the November 2015 Soundings brought to mind an episode in the gestation of the 280 Program that is probably not well known and at the time had the potential to seriously damage the program if not terminate it. The contract to supply the unique all-gas-turbine propulsion plant was awarded to United Aircraft of Canada (UACL) a subsidiary of United Technologies of Hartford Connecticut, which also had Pratt and Whitney as a division. P & W supplied the gas turbines, suitably marinized, to the 280 program.

The Navy arranged for UACL to take a shaft line of the power plant to be set up and tested at a USN facility in the Philadelphia Navy Yard. This facility, called at that time NAVSEC, was used primarily to test the non-nuclear portions of USN submarine propulsion plants and could absorb the fifty thousand horsepower of the DDH 280 plant. In late 1968 I was sent to Philadelphia as the customer and trials officer to oversee the setup, the set to work, trials, the tear down and return of the plant to Canada. The process took almost two and a half years.

Although we identified over 225 defects, deficiencies and snags, most were minor in nature and were rectified in the delivered power plants. Much progress was made in integrating the first generation analogue control system with the hardware. A lot of it was of the “suck-and-see” variety of engineering, as computer modelling was still in the future. Proof of concept was accomplished.

Back in NDHQ I became DMEE 3, section head for propulsion design, and as such responsible for the set to work, trials and acceptance of the power plants in the DDH 280 ships as they completed. After successful set to work and alongside trials we headed down river from the MIL yard in Sorel to complete sea trials in the first of class Iroquois. Shortly we lost one of the cruise engines (FT 12). We went alongside and had a spare FT 12 trucked in and
changed out the offending engine (another first). When we opened it up it was discovered
that the combustion canisters were filled with rock-hard carbon. No combustion was possible.
The consensus from P & W and UACL people on board was we had a unique "bad engine" So in a
couple of days we were buttoned up and heading down the river continuing the trials. Just below
Quebec City the other FT 12 quit. So much for the "one bad apple" theory.

We stopped in Rimouski to do a lot of head scratching. Our contractor UACL and P & W
came up with the theory that the anti-corrosion coating we the Navy had specified for the inside
of the hull including the fuel tanks contained vanadium. This vanadium leached into the marine
diesel fuel and which altered the fuel’s combustion characteristics. If this were correct then all 9
gas turbines on board were vulnerable. The potential solutions were horrible to contemplate and
all to our account. We took the ship back to MIL Sorel on the main engines with our fingers
crossed.

Back in Ottawa I was more or less frog-marched into DGMEM’s office. I remember Cmdre
Graham Bridgman as being very calm and composed for someone who probably saw his career as
shortly being over. If he was to walk the plank he may have taken solace from the fact that I
would be ahead of him. He reviewed what he thought would be on the front page of the Globe &
Mail in the not-too-distant future; to wit,

"Brave little Canadian Navy builds world’s first all-gas-turbine powered warships. Takes
power plant to US Navy in Philadelphia to test proof of concept. Can’t get first ship to tidewater
from Quebec shipyard before engines break down. Solution and costs not known."

I realized the truth of the old adage that the threat of being hung in the morning tends to
concentrate the mind. I discovered that the Department of Energy, Mines & Resources had a
combustion lab in a facility at Bells Corners and they agreed to assist in an expedited fashion. I
delivered an FT 12 combustion canister and fuel nozzle and pending the delivery of a couple of
barrels of “contaminated fuel” they would run a combustion test using stock marine diesel fuel.
Very shortly we had an answer. The fuel nozzles fitted in our FT 12’s were aircraft nozzles
designed to burn AVGAS and not capable of burning diesel fuel.

Program saved.
Careers saved.
A few days later Graham Bridgman allowed as how he always had faith.

In my "I love me room" at home I have a chrome-plated FT 12 combustion canister with a
plaque mounted on the base that reads, "Things Go Better With Coke." S

NAC Endowment Fund Grant

Recently and on behalf of the NAC Endowment Fund, Howie Smith,
President of the Naval Association of
Canada–Ottawa Branch (centre) had
the pleasure of presenting a cheque
in the amount of $5,000 for the
Royal Canadian Sea Cadet
Education Foundation to Harry T.
Harsch, Chairman, (left) and John
Bell, Vice-Chairman (right). S
Propulsion System Enablers for Advanced Mission Systems in Future Naval Combatants

Modified, with permission, by Edward Francis Wright MSc. C.Eng. MIMarEST, Senior Engineer with Rolls-Royce Marine (UK), from the paper of the same name originally authored by Richard Partridge C.Eng. FIMarEST, Chief of Naval Systems, Rolls-Royce (UK). Mr. Wright would welcome queries concerning this article at edward.wright@rolls-royce.com.

[By the Editor: In order to follow on from the article in the Autumn 2015 Soundings on the All-Electric Ship, I asked Rolls-Royce Canada for an article on the future technologies coming for marine gas turbines. Thanks to Bruce Lennie of Rolls-Royce Canada for his assistance. This article has been slightly modified to fit the space available.]

Introduction – Legacy Mechanical Arrangements

Over several decades, the propulsion system of choice has been the mechanical arrangement, which is completely independent from the ship’s electrical power generation and distribution system. The electrical power generation system usually consists of four low voltage generator sets, each driven by diesel engines (European navies) or gas turbines (US Navy and some NE Asian navies). Mechanical propulsion systems were generally configured in one of the following arrangements:

- **COGAG (Quad-GT)** – originally specified in the 1970’s for USN guided missile destroyers and cruisers [Figure 1]:
  - Four 18MW GTs necessary to provide top ship speed at 30+ knots, but no real ‘cruise’ plant.
  - Larger ship design permitted staggered propulsion trains via longitudinal separation, for survivability.
  - Again the ship operating profile was dominated by low- to moderate-speed, supported operationally by a single 18MW GT, with opposite shaft trailing.

- **CODOG (Twin-GT)** – specified in the 1980’s and 1990’s in many European and Asian navies [Figure 2]:
• Cruise & boost configuration, with cruise diesel engines rated for 18-20 knots, and boost GTs for 30 knots.
• Propulsion diesels providing good fuel economy across most of the operating profile, but needing more on-board maintenance and less suitability for anti-submarine warfare due to vibration from reciprocating engines at low ship speeds.
• Ship design and layout of relatively small platforms forced collocation of cruise engines in an aft engine room, and boost GTs co-located in a forward engine room.

These arrangements were all constrained by the availability of aero-derivative marine GTs at the time of selection, essentially up to ~18MW per unit, mandating boost GT capability via twin-GT (frigate and small destroyer) or quad-GT (large destroyer) arrangements to reach the necessary top ship speed of ~30 knots.

Hybrid – Low Underwater Signature for ASW Operations

CODLAG was specified in the mid-1980’s for the UK Type 23 Frigate, leveraging technology from submarines; i.e., dc motors, fixed pitch propellers and rafted diesel generators, and applying lessons learned across the platform from operational experience of legacy ships during the Cold War and the Falklands conflict. The CODLAG arrangement [Figure 3] had the following characteristics:

• Shaft-mounted electric motors for ASW operations and cruise speed up to 15 knots powered by Diesel generators, twin-boost GT for top ship speed of 28 knots.
• Operational benefits of (i) low under-water and signature, (ii) low operating costs in the context of the operating profile dominated by low and moderate ship speed, widely reported by others.
• Redundancy, flexibility and good (but not perfect) match to ship operating profile, since achievable economical cruise speed was/is too low at 15 knots, against an ideal 18 knots.

However, significantly better fuel economy was realised compared to all-GT propulsion in legacy (mechanical) RN warships. This was due to the diesel-electric plant’s ability to cover much of the sea-going operating profile – with military benefits including extended range and less reliance on replenishment ships.

The CODLAG system has been shown to be sufficiently future-proof to support progressive upgrades to the Type 23 frigate to facilitate a change of role (weapons/sensors for more general purpose capability) and a change of operational area (temperate environment to unrestricted global operations, changes to heating, ventilation, air conditioning, etc.) The Type 23 frigate is currently entering a ship life extension program to extend the life of the class to 2035, possibly beyond.
21st Century Constraints

Legacy warships were often single-role and were configured around defensive duties including escort or task force protection. Nevertheless, naval markets are evolving in response to new threats, and with emerging constraints are posing new challenges to program managers. These days smaller defence budgets in many regions are necessitating multi-role warships – resulting in the need to ‘cram-in’ as much military capability per platform as possible – within heavily-constrained ship parameters; i.e., overall length, beam and displacement.

To support a higher variety of military missions, more operational flexibility is needed from the propulsion and power (P&P) system than ever before. Other factors that will often influence P&P selection may include:

- New and emergent Environmental regulations (Ballast Water Treatment Systems, waste disposal systems, double-bottomed hulls, Diesel engine NOx emissions and after-treatment systems).
- Prolonged deployments – envisaged for up to 2 years – putting more emphasis on availability & reliability of mission-critical systems, and human factors.
- Larger helicopter (with hangar) and often separate ‘mission hangar’ for unmanned surface/sub-surface capability.
- Steadily rising ship electrical service loads.

It is not hard to see that these factors are putting more emphasis on power-dense yet reliable P&P systems and equipment than in legacy warship designs/programs, and the steady rise in ship service load means that mechanical is becoming progressively less attractive for many types of surface warships.

This steady rise in service load is attributable to the changing mix and type of weapons/sensor technology and associated auxiliary/cooling loads. Looking to the future, and given the rate of development of technology including direct energy weapons for large DDGs which have an operational need to one day accommodate electromagnetic rail gun technology in addition to lasers, the projected change in ratio is envisaged to be quite dramatic with the impact on new programs being that mechanical propulsion can no longer be the default choice. Furthermore, due to the high electrical load demand, an integrated power system (IPS) will be necessary to enable the future retro-fit of main armament rail guns, which will provide a level of assurance to the navy that the platform is able to retain its military relevance for longer. Although large IPS-powered DDGs require a relatively high capital expenditure, the degree of future-proofing offered by IPS can be viewed as an enabler for overall value for money insofar as facilitating a substantially longer in-service life than that offered by conventionally propelled ships. The USN believes that electrical power margin delivers future military capability4, and in that sense it can be considered as a strategic resource; i.e., giving (future) military advantage and value. They have adopted IPS in certain recent combatant programs, as has the Royal Navy.

Given program requirements and budgetary constraints, operational/life cycle costs are also of critical importance, and these days great emphasis is placed on low platform energy (fuel) consumption – fuel can also be considered as a strategic resource – and low maintenance supporting (for many navies) lean manning levels. Naturally for any warship program, adequate redundancy and survivability is still completely necessary, as is personnel safety and equipment reliability/resilience. Many navies also have a strong preference for low risk; i.e., proven equipment and technology.

For modern combatants, two discrete scenarios are emerging, each of which demands further consideration:
1. Large capital warships, e.g., DDGs such as the RN Type 45 and USN DDG1000, where IPS has been implemented to maximize operational flexibility and future capability.

2. Smaller, more affordable and general purpose warships like destroyers and frigates (such as the RN Type 23 and 26 frigates) where hybrid P&P systems have been implemented to improve ASW and general purpose capabilities as well as increase affordability.

Each of these scenarios should be considered separately but the underlying premise of each option is that the capability owner requires platforms with sufficient inherent design and operational flexibility to facilitate incremental additions to mission systems to maximise platform life.

For the Canadian Surface Combatant (CSC) program, the platforms currently under consideration for this program mostly feature hybrid P&P systems so these will be discussed in more detail here.

New Choices: Hybrid for Smaller More Affordable and General Purpose Warships, Such as the Canadian Surface Combatant

Single-GT Hybrid arrangements consisting of electric drives for ASW operations, low and medium transit speeds, and a highly-rated GT for boost (high ship speed) operation in either a CODLOG or CODLAG arrangement is increasingly becoming the system of choice. Examples of programs which have selected this arrangement include the Franco-Italian FREMM program, German F125 frigate, Republic of Korea Navy FFX-II frigate and the RN Type 26 global combat ship. Other European naval programs have also selected this arrangement but are currently in the basic ship design phase.

New modern aero-GT technology offers ultra-high reliability and low life cycle costs, with up to 40MW of unitary power now available even at elevated ambient air temperatures. So what does/should this mean for 21st century warship propulsion? Certainly new choices and opportunities for warships over 3000 tonnes displacement, offering fewer ‘boost’ engines than in legacy ships.

Careful specification of the mechanical/boost plant (e.g., main reduction gearbox, GT, aux systems) is necessary, with due focus on operational aspects, performance and reliability. Acceptable survivability and vulnerability from modern P&P systems with fewer engines can be maintained when viewed from a system perspective and with careful layout, avoiding dependencies/common-mode failures, as discussed in previous technical papers.

Case Study - The UK Type 26 Global Combat Ship

The UK Type 26 Global Combat Ship will eventually replace the Type 23 frigate and will include ASW and General Purpose variants, each at approximately 6,700 tonnes displacement, and using a common hull and ship systems. The Type 26 program evaluated mechanical, all-electric and hybrid P&P options in detail during the assessment phase of the program.

Artist’s impression of the Type 26 Global Combat Ship
A single-GT CODLOG hybrid arrangement [Figure 4] was ultimately selected, consisting of propulsion motors and diesel-electric system for cruising speed, covering approximately 95% of sea-going operation, and a single boost-GT providing 26+ knots. Having been selected to supply the MT30 GT, Rolls-Royce Naval has been associated with the program for some time, and based on this experience, plus that in other similar programs (e.g., the RoKN FFX-II frigate), the following observations are made on modern warship programs:

1. Detailed and iterative analysis is necessary, using various electric motor ratings and technologies (and including the associated power generation and distribution system components), with consideration of physical attributes (mass, volume, physical integration) to systematically converge on the 'sweet spot' for the electrical plant in the context of program and ship design constraints.
2. CODLOG arrangements enable the designer to optimize the cruise/low-speed capability gaining maximum operational and life-cycle cost benefit.
3. ‘Or’ arrangements (CODLOG) are relatively simple and cost-effective when compared to a CODLAG system. However, where additional power is required over that which is provided by the single boost GT for top ship speed, CODLAG systems can be successfully implemented. This is demonstrated by the successes of the Franco-Italian FREMM platforms.
4. Care is needed to specify a truly resilient power generation and distribution system with built-in redundancy, flexibility, survivable via careful layout, has low vulnerability and via carefully configured electrical system design plus growth margins, is future-proof in terms of reasonably-foreseen upgrades to shipboard mission systems.
5. Directed energy weapons currently in development, such as lasers for close-in protection, will one day be available for retrofit to warships having up to 10MW of available electrical capacity. It is likely that when a warship needs to operate its close-in weapons systems it will also need to be highly-maneuverable at top speed. A carefully configured CODLOG arrangement has sufficient mechanical power from the GT to achieve top vessel speed whilst at the same time releasing the ship’s electrical capacity (diesel generators) to support future close-in weapon systems.
6. The need for a cost-effective (yet highly power-dense and reliable) ‘boost’ gas turbine and gearbox capability, including initial acquisition and life cycle costs.
7. High power output boost GTs can be viewed as the enabler for Hybrid arrangements in smaller platforms insofar as they permit the co-location of the gas turbine and two

Figure 4. Single-MT30 CODLOG propulsion arrangement.
of the diesel generators sets in the forward engine room, avoiding the need for a separate forward auxiliary machinery room and thus allowing the overall length of the ship to remain within program-specific limits.

8. Other enabling technologies include power-dense generator sets, for example the Series 4000 military variant diesel generator set from Rolls-Royce Power Systems (RRPS) MTU, rated at up to 3015kWe, or the new AG9160 gas turbine generator set, rated at 4000kWe.

9. Equipment health management (EHM) systems should also be specified to proactively maximize operational availability of engines based on condition.

10. Other important elements include torque-dense propulsion motors, intelligent specification/design of the electro-mechanical and automation systems – and identifying and investing in design/operational flexibility where needed; i.e., specifying margins in electrical power generation and distribution, chilled water, space and stability, to ensure the right balance of initial acquisition cost and future-proofing is achieved for each new program.

**Design Criteria for Main Gas Turbines in the 21st Century**

![Figure 5. Twin-GT Hybrid CODLOG for a large DDG](image)

Modern naval programs require the following design characteristics for boost gas turbines, enabling the installation of fewer gas turbines including a single-GT in new generation frigates (3000-7000 tonnes displacement) as previously shown in Figure 4. Modern large DDG programs (7000-10000 tonnes displacement) can leverage many of the platform design and operational/life cycle cost benefits by adopting an arrangement illustrated in Figure 5, rather than the conventional four-GT Mechanical/COGAG.

**Performance** - High unitary power output even at elevated ambient air temperature is required from the GT, with graceful degradation in power output at extreme environmental conditions. High levels of power density are required from the package/acoustic enclosure, with minimal off-engine components for ease of installation. Equally important is a robust engine in terms of thermal capacity, allowing power output to be retained between overhauls, and generous turbine entry temperature margins giving very long time between overhaul. This is crucial since a boost engine will experience a majority of running at high-power conditions.

**Operability** - A wide engine performance envelop is essential to support good transient ship performance (acceleration, turning at high-speed, towing). Also, excellent dynamic/load-following performance, essential in generators in IPS configurations for supporting stringent naval electrical quality of power supply requirements. Rapid start-up times from cold engine condition, and high ramp-rates from idle to full power are crucial, and there should also be no limitations on the engine re-starts after a sudden shutdown at high power. This is especially critical for single-GT based propulsion systems.
Maintenance/Life Cycle Cost - Naval boost capability also necessitates a low on-board maintenance burden, and a long time between hot-section replacement and main overhaul. This is the case with the MT30 GT, the on-board maintenance and overhaul events having been evaluated against typical naval usage patterns, which indicate that the engine is unlikely to ever require an overhaul in many warships where it is configured as a boost engine.

Design requirements should include ease of engine removal, including a number of options in terms of removal methodology.

Maximum commonality with aero GT parentage is necessary to use common manufacturing lines and supply chain. The MT30 GT achieves approximately 80% commonality with the aero- and industrial-Trent engine family, ensuring good supportability and low cost of ownership.

High thermal efficiency is of course the prerequisite for good fuel economy, with around 40% now achievable at design point from modern aero-derivative GTs. Relatively good levels of efficiency should also be maintained at moderate loads, to allow the GT to support operation across the entire ship speed range without prohibitively poor fuel economy.

The Rolls-Royce MT30 gas turbine (see cover photo) embodies all of the above design criteria and is now on six naval programs, including USN Littoral Combat Ship (monohull) which has been at sea since 2008, USN DDG-1000 (Zumwalt Class) which is now undergoing sea trials, UK Queen Elizabeth Class carrier which is in the water undergoing final outfitting, and the Republic of Korea Navy FFX-II frigate which is in build. The MT30 has also been recently been selected by BAE Systems for the UK Type 26 Global Combat Ship and by Fincantieri for the Italian LHD program. With up to 40MW of power output (at 100 degrees Fahrenheit ambient air temperature) from a very compact package, the MT30 provides unprecedented levels of power density and has become the GT of choice for modern naval programs as it is the world’s most powerful marine gas turbine in service today offering powers, even at high ambient temperatures.

Conclusions Relevant to the Canadian Surface Combatant Program

1. CSC will face conflicting requirements; to successfully deliver multi-role capability and a certain degree of future-proofing to enable incremental addition of mission-systems. This demands a fresh approach to propulsion system design and selection.

2. Hybrid arrangements are intuitively more future-proof than mechanical, as demonstrated by the UK Type 23 frigate over the last 24 years in-service, by virtue of the inherently larger installed power generation and distribution system.

3. Carefully thought out and applied margins can significantly extend the life of the platform – a major affordability consideration given the prohibitively large cost of
major upgrades, and the need to retain the military relevance of the platform for longer. Selecting a CODLOG arrangement and investing in intelligently configured margins in the power generation and distribution system are recommended.

4. In the 21st century, fuel – and increasingly, electrical power generating capacity – are strategic resources, with advanced navies recognizing that electrical power margin delivers future military capability. The selection of a hybrid platform for CSC will automatically include increased power generating capacity and will represent a step change over its mechanical predecessor the *Halifax* class.

5. Naval programs are increasingly seeking more power from fewer prime movers whether in hybrid or IPS arrangements. Modern aero-derived gas turbines that give substantially higher unitary power and therefore power density have - and are - challenging propulsion convention – enabling fewer installed engines, in an arrangement that needs to be carefully matched to the operating profile(s) so as to provide the required reduction in life cycle costs compared to legacy platforms.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

**Ottawa Branch Outreach**

By Wendell Sanford

The change of government in mid-October led the NAC Ottawa Outreach Committee to review the content of the presentation. A few adjustments were made; e.g., removing former Prime Minister Harper’s comments. However, the sections on policy were left intact with the understanding that the presenter is to qualify the current strategic emphasis as subject to review in light of this month’s announcement of a Defence Policy Review. Slides have been adjusted accordingly and the updated presentation is on the NAC website.

Outreach events were held at Rotary Club of Ottawa (24 November) and Ottawa South (30 November). With 30 - 40 attendees at each event and they were well-received. In the New Year a new approach was undertaken. As Wendell Sanford was speaking to a class on United Nations practice at Saint Mary’s University in Halifax he, with the encouragement of the Political Science faculty, made an Outreach presentation on campus (25 January). Thirty students and several faculty members were in attendance. The discussion was lively and positive. Three additional presentations were made in the Ottawa area in the January - March timeframe. In order to ensure that the Canadian Society of Senior Engineers had a speaker who understood their language, Gordon Forbes spoke to this group 16 February. Unfortunately it was the day of the "big snow" in Ottawa which limited attendance. The Ottawa West Rotary had 50 in attendance 8 March with an enthusiastic group which kept the questions going, all positive, for more than 30 minutes. A smaller group of 10 attended the Kanata Rotary presentation March 10th.

In Summary, six presentations were made (4 to Rotary clubs, one to professional engineers, and one to university students) with approximately 175 taxpayers in attendance.

As we are entering the spring season when service clubs begin to wind down, we do not plan to shop for further opportunities until September, at which time more information should be available with respect to the Defence Review.
The Bear Went Swimming
By George Kolisnek

There was actually a significant surge in the Soviet Navy's size and activity during the early 1980's just as the USSR was actually heading towards an eventual breakup.

From 1982 to 1987 I was appointed to the staff of NATO's Commander-in-Chief Channel (CinCCChan) and Commander in Chief Eastern Atlantic (CinCEastLant) headquarters in Northwood, England. Those five years proved to be a pivotal era in the Cold War. President Reagan could not accept the previous policy of assured mutual destruction and so began evolving the USA's nuclear strategy into space-based defensive sensors and weapons. During those same five years the USSR went through a series of rapid leadership changes that did not always provide clear signals to NATO in which direction the country was heading; that is, towards or away from either a more-or-less confrontational military stance. Both of the above developments created an unstable international situation at geostrategic levels, but we also saw developments that contributed a source of insecurity at the day to day operational level. NATO began deploying Ground-Launched Cruise Missiles (GLCMs) and short range ballistic missiles in to Europe, a threat for which the Warsaw Pact had no defence.

One of the primary missions assigned to CinCEastLant was coordination between NATO members of reporting on and surveillance of Soviet activities in the Eastern North Atlantic area, which stretched from Norway to Greenland and south to the Canary Islands. Given that the Soviet Northern and Baltic Fleets were very large, very active, and the most modern of Soviet fleets, the tracking and surveillance of their activities in the Eastern North Atlantic region was always very challenging, but especially so in the early 1980’s as the previous decade of designing and building of new Soviet ships and submarines came to fruition. The introduction of two new classes of SSBNs, namely the Typhoon and Delta IV, into the Northern Fleet enabled the Soviet Navy to operate closer to home while at the same time to significantly increase its nuclear capability. These two new classes of submarine carried missiles capable of reaching North America with more warheads and greater accuracy. Both Typhoons and Delta IVs were now also able to operate under and through the Arctic ice, which greatly increased their survivability by all but eliminating NATO's ability to track their activities and deployments.

NATO was also significantly changing its own nuclear capability and both its maritime and military strategy in the first of the 1980’s decade. Beginning in 1983 the US began deploying GLCMs into the United Kingdom and NATO nations in Western Europe. These missiles were highly accurate and nuclear-tipped. They were capable of flying at low levels and could be launched at very short notice against targets in Eastern Europe and the USSR. Needless to say, the USSR and its fellow members of what was then the Warsaw Pact saw the deployment of GLCMs to be a very destabilizing and serious escalation of confrontation, especially as at that time they had no real counter for the weapon. NATO was also changing its military and maritime strategy, both of which were being influenced by NATO’s new cruise missile capability and the USSR's new nuclear capabilities. The military part of the planning was increased emphasis on developing what was called at the time a counter-C³ (Command, Control and Communications) strategy. This strategy called for attacks against Soviet command, control and communications such that their ability to
conduct and coordinate their forces would become dysfunctional from the start of any open conflict. The maritime planning was for what was at the time called the Forward Maritime Strategy, that is the deployment of NATO maritime forces to forward areas around the shores of Europe, for example the North Norwegian and North Sea areas, both of which were within the CinCEastLant area of responsibility.

The Soviet Navy had not only produced two new classes of SSBNs capable of attacking any NATO targets from home waters. The Soviets had also begun building and producing the ships and attack submarines that were capable of operating with those SSBNs as well as deploying further from adjacent USSR waters to areas of interest around the world. The Soviet Navy began deploying three new and significant classes of submarines beginning in 1980. The Victor Class I and II attack submarines had been deploying throughout the 1970s, but the newly built Victor III Class with improved sensors such as a towed array acoustic sensor and some type of new non-acoustic sensors began operating in the early 1980’s both close to home waters and further abroad. Another attack submarine class, the Akula, also with new types of sensors and weapons, including torpedo tube launched cruise missiles and faster and longer range torpedoes began operating in CinCEastLant areas. A new class of large missile attack submarines, which NATO designated as Oscar, capable of firing either conventional or nuclear warhead anti-ship missiles across long ranges began deploying in CinCEastLant waters. These submarines posed a considerable threat to NATO ships including aircraft carriers, as they also had significant protection from NATO weapons due to the large gap between their twin hulls in which their missiles were housed.

It was not only submarines that the Soviet Navy built and began deploying in the early years of the 80’s decade. Two new classes of destroyers were built in Baltic Sea shipyards and began deploying to fleet areas. Eight Sovremenny Class anti-surface warfare ships and four Udaloy Class anti-submarine warfare ships added a significant capability to Northern and Pacific

Sovremenny

Kirov/ Ushakov
Fleets. These ships were just as modern and capable as any ships in NATO. A new class of nuclear-powered vessel was also built and began sailing into EastLant waters at the same time. The nuclear-powered battle cruiser Kirov (now called Admiral Ushakov) became part of Northern Fleet after 1980. The Kirov and these new destroyers with their larger size and improved armament gave the Soviet Northern Fleet the ability to deploy integrated warfare task groups further away and for longer periods than they previously could. I will come back to this issue later when discussing Soviet Navy exercises in EastLant waters.

While all of these new additions to Northern Fleet were significant and required close attention as they transited from shipyards through EastLant waters, there were also numerous activities of a more routine nature taking place that were of interest to NATO countries. Through the first half of the 80s decade there was on a daily basis the presence of several Soviet submarines and ships in EastLant’s area of responsibility. Two to three Yankee class SSBN’s would be in transit to and from patrols off the North American East Coast due to the short range of their SS-N-6 Submarine Launched Ballistic Missiles. As more Delta Class SSBN’s with their longer range missiles joined Northern Fleet through the 1980s these patrols began Yankee Class SSBN on one such patrol caught fire and sank about 700 miles’ northeast of Bermuda.) SSGNs and SSNs were also present on a daily basis. Besides routine patrols in the Norwegian Sea and Greenland-Iceland-United Kingdom (GIUK) gap against possible NATO intruders, there were on average at least three submarines in transit to and from Northern Fleet to the Mediterranean Sea. Victor, Charlie, and Echo II Classes of SSGNs maintained a presence in the Mediterranean against NATO ships, submarines and carrier battle groups. Their time on patrol in the Mediterranean was not long given that these submarines made no port visits while there. They revealed their presence only when needed alongside pre-positioned supply and support ships due to problems with either supply or engineering or accidents of some kind. Given the long transit time to and from Northern Fleet to the Mediterranean and back and short patrols there was a constant stream of submarines going back and forth through EastLant that also included diesel submarines of the Foxtrot and Tango Classes.

Soviet Navy frigates, destroyers, cruisers and aircraft carriers had a presence in EastLant areas as well on a routine and exercise basis. Krivak and Kresta Class ships deployed from Northern Fleet to the Mediterranean on a rotational basis and stayed there longer than their submarine colleagues. During some winter months the Kiev aircraft carrier would deploy from Northern Fleet at the center of a task group into the Mediterranean where it could conduct daylight flying operations. All of these activities posed a challenge for EastLant in coordinating adequate responses by NATO resources. During the period 1982-1987 that I was at EastLant, the Northern Fleet routinely conducted over 200 submarine deployments a year.

As previously mentioned, NATO began positioning GLCMs in Europe in 1983. The Soviets reacted in a number of ways, but from a maritime perspective the most important was that the Northern and Baltic Fleets began a series of annual out-of-area exercises in the EastLant area. These exercises involved submarines and ships in task groups operating for up to a week in the Norwegian and North Seas, GIUK gap and areas West of the United Kingdom. They were unannounced and included long range air support by Bear and Badger aircraft. On each occasion EastLant had little notice and had to quickly organize a NATO response in the form of determining the intent of each exercise given the tense political relationship between NATO and the Warsaw Pact as well as the ongoing leadership turnover in the Soviet Union. Perhaps the biggest
challenge in this regard took place in the spring of 1984, when the Soviet Navy conducted its largest ever nuclear exercise.

Within twenty four hours Northern Fleet sent over 50 submarines to sea along with several surface action groups. The submarine portion of the exercise included more than twenty SSBNs. The remaining number of SSNs and SSGNs deployed into the Norwegian Sea, GIUK gap and west of the United Kingdom. The surface action groups also deployed into those same areas, and that probably required a very greatly worked out level of water space management and ongoing coordination. These surface groups consisted of a mix of cruisers, destroyers, frigates and supply ships. One group was centred around the Kiev aircraft carrier group operating in the central Norwegian Sea. Needless to say this rapid deployment of nuclear and conventional submarines and ships created a stir within NATO and national commands. It still is the largest navy exercise ever conducted by either the Soviet Union or Russia. Given the already mentioned tense international political situation this exercise only contributed to the lack of clear intent with respect to the direction of Soviet leadership at the time.

I have recently read that the current level of Russian naval activity in the GIUK Gap exceeds that of the Cold War. Given what I have discussed above I believe that statement shows a lack of knowledge of what went on before, possibly due to Cold War secrecy. While I was at EastLant, the Soviet Northern Fleet conducted on average over 200 submarine deployments a year, plus an annual out-of-area exercise and significant deployments to the Mediterranean on a routine basis. That is not to say that current Russian navy activities are not significant; however, the current order-of-battle of about 50 nuclear submarines in the Northern Fleet is a far cry from the Cold War days. In fact, Canada contributed to this lower order-of-battle by paying over 100 million US dollars to decommission three of the above mentioned Victor III Class submarines as part of an international effort to help Russia dispose of old nuclear submarines.

As we know in Canada, the long lead time required to design and construct an advanced and capable Navy contributed to the Soviet Navy having arrived at its peak in the early years of the 1980s just as its political support was beginning to unravel and fall apart. The submarines and ships in the Russian Navy today, some of which actually began construction in the 1980s, are more capable but will almost certainly be fewer in number than before and deployed closer to home.

The Bear still swims, but with shorter strokes. S

**Toward the Recognition of Ocean War Graves**
By Paul Bender

The Battle of the Atlantic during World War II has been variously described including that it was the longest battle of that war. It began on September 3, 1939 on the day that Britain and France declared war on Germany with the sinking of the passenger-liner “Athenia” off the coast of Ireland barely nine hours after the declaration of war with considerable loss of life. Most of those whose lives were lost were women and children who were being evacuated from Britain to Canada. The sinking of the “Athenia” resulted as well in the loss of the first Canadian of the war – Hannah Baird from Verdun, Quebec, a member of the ship’s crew. The Battle of the Atlantic ended on May 7, 1945. On that day, the Canadian merchant ship s.s. “Avondale Park” was torpedoed and sunk off the east coast of Scotland just one hour before Germany surrendered and V-E Day began. SS. “Avondale Park” was the last Canadian maritime casualty of the Battle of the Atlantic.
The Battle of the Atlantic left thousands of vessel sunk, with great loss of life, scattered between the Americas and Europe. Unlike the carnage of the many land battles that were fought, the last resting places of those lost at sea are not found in vast cemeteries or formal battle site memorials, but mainly on the sea-bed with the remains of the ships in which they served. In many cases, the ships sunk took many of their crew with them.

These wreck sites are threatened by both natural forces and human interference. It is the intentional interference with these wreck sites that is of the greatest concern. With great leaps in underwater diving technology, many of these wrecks are increasingly accessible to professional salvors. Except in rare cases, the owning country of these wrecks did not however appear to have objected to these activities and the fact that they contained the remains of those who perished appear to have been of no concern.

The combination of relatively inexpensive, sport diving technology and the growth in “battlefield tourism” has also exposed these wreck sites to a number of threats. The growth in the number of divers visiting these sites exposes them to increasing levels of accidental damage as well as disturbance that might accelerate natural degradation. While sport divers are becoming increasingly educated in relation to the significance of wreck sites, and the need to respect wrecks where lives were lost, the pillage of sites for souvenirs remains commonplace.

Burying our dead is so common a cultural trait that it is essentially an act that defines us as human. The burial of those who died in battle defending their families, their friends, their sovereign or their country has heightened ceremonial and emotive contexts. The sacrifice of so many in the battlefields of foreign lands required a dramatically new approach to burying the fallen. This was particularly so for those soldiers drawn from distant lands (Canada, for example) whose families were unlikely ever to be able to visit their graves or the battlefields on which they died. This gave birth in 1917 to the Imperial (now Commonwealth) War Graves Commission whose founding principle was that all soldiers who died in battle should be buried abroad in individual, but identical, graves. Its war cemeteries and monuments commemorate the dead and missing by naming them all, one by one. The scale of the destruction has been such that the remains of many soldiers could simply not be found and memorials have been erected to those who will be forever missing. Like those missing on the battlefield, the remains of sailors who went down with their ships would never have an individual grave. At the time of the establishment of the Commonwealth War Graves Commission, technology simply did not allow for the recovery of those lost at sea and they were treated as forever missing. Very little has changed notwithstanding a significant change in technology.

Missing sailors, however, are treated very differently to missing soldiers. Part of the rationale for burying the fallen on the battlefield was the difficulty of repatriating the fallen to their countries of origin, especially when many of them came from, for example, Canada. It was also thought that those who fell together in battle would want to remain together in death. As recovery and repatriation of the remains of soldiers was considered logistically difficult, so too, were those of sailors, especially in deep waters far from land. While technology does now allow access to many of these ships and the remains of their crew, recovery and repatriation is still difficult. As such, recognition of these sites as Ocean War Graves is appropriate. Such recognition is consistent with the principles underpinning the burial of fallen soldiers. While this principle may apply equally to fallen sailors, who went down with their ship, the Commonwealth War Graves Commission to whom Canadian taxpayers are contributing more than one million dollars each and every month, does not include these Ocean War Graves within its mandate, and indeed, recognizes no such concept as an Ocean War Grave.

Similarly, The UNESCO 2001 Convention on the Protection of the Underwater Cultural Heritage (to which Canada is not a signatory) also does not recognize the concept.
of an Ocean War Grave. Human remains are incidental to the archeological aims of the Convention, and essentially treated as archeological artifacts. The Convention does, however, provide that states party to the Convention shall ensure that proper respect is given to all human remains that are underwater cultural heritage located in maritime waters. An Annex to the Convention dictates, in part, that “activities directed at underwater cultural heritage shall avoid the unnecessary disturbance of human remains. . .”

It is essential to understand that an Ocean War Grave is not simply the maritime equivalent of the type of war cemetery administered by the Commonwealth War Graves Commission.

Whereas soldiers buried in those cemeteries are buried in individual graves separate from one another, each grave site marked with a headstone on which is engraved details of the deceased, an Ocean War Grave, on the other hand, is the consequence of a ship coming to rest on the bottom of the ocean, sometimes at incredible depths, consequent upon its destruction at enemy hands. Perhaps the ship was torpedoed, perhaps bombed, perhaps destroyed by shelling, perhaps by striking a mine – damage that was compounded by the explosion of the ship’s boilers or perhaps its ammunition. The human remains of the sailors who were not able to escape into lifeboats or onto life rafts or who were fortunate to be rescued by another friendly ship may be found, not in segregated grave sites but anywhere within the twisted wreckage of the ship in which they once served; perhaps scattered throughout the ship, perhaps huddled together in one or more compartments with no hope of escape because buckled bulkheads prevent the opening of watertight doors. There is no headstone among the flowers for those who perish at sea except, perhaps in one place – the war section of the Fossvogur cemetery in Iceland where 14 sailors from HMCS Skeena who drowned during rescue efforts when that ship ran ashore in October, 1944 are buried.

The concept of Ocean War Graves simply does not exist, neither in international law nor in Canadian law. A natural response to this omission is to advocate for a norm that does recognize such a concept which starts with a recognition of the sacrifice made, of the need to sanctify the last resting places of those lost and of the need to respect and protect these places from unjustified disturbance, embedded in a resolution to recognize conceptually the Ocean War Grave.

Absent enabling legislation in Canada consideration is being given to incorporating by reference into Canadian law the UK Protection of Military Remains Act, 1986. Although passed by Parliament in 1986 departmental policy on the application of the Act was not published until 2001. While the Act has merit it is not perfect in that, although it protects military wrecks from unauthorized interference and provides for other matters, it does not actually recognize the concept of an Ocean War Grave, the protective mechanism applying only to the wrecks themselves which could be applied even if there were no human remains. Nevertheless, the Act is an example of domestic legislation that is directed at protecting Ocean War Graves from unauthorized interference. But only military Ocean War Graves. In order to make a case for a merchant ship to fall under the Act it would be necessary to first establish that the merchant ship was “in military service” at the time of her loss. Once that was established, the merchant ship would be assessed against strict criteria including whether or not lives were lost – in other words, whether or not the merchant ship met the definition of Ocean War Grave. So far as is known there has been only one case in which the designation of a merchant ship under the Act has been achieved but that case could serve as precedent.

If it is not provided elsewhere, new legislation addressing Ocean War Graves should provide that, right, title and interest in any Canadian military vessel whether afloat or sunken is not extinguished except by expressed divestiture of title by Canada, and is not extinguished by the passage of time regardless of when the military vessel sank. Thus, the Republic of France, in its memorandum respecting the application of France’s Heritage
Code to the Ocean War Grave that is HMCS *Athabaskan* which has lain in French territorial waters since 1944, wrote “the Government of Canada, as the owning State, will be officially solicited by the relevant services of the French Republic before any authorization [to have access to the ship] is given.” (Translation). As well, such new legislation should provide that the law of salvage and the law of finds do not apply to Canadian military vessels.

The precise location of Ocean War Graves is unimportant unless they pose a danger to navigation, pose an immediate pollution threat or contain potential environmental impacts. If any of the foregoing should occur, their precise location will be determined soon enough. In the meantime, they should be left alone but not forgotten. Thus, the Ocean War Grave that is, for example, HMCS *Raccoon* (37 lives lost) is said to lie “off the Gaspé coast.”

Should it become necessary or desirable to recover anything from this Ocean War Grave permission will have to be sought from the appropriate Canadian authority just as philanthropist Paul G. Allen had to obtain permission from the U.K. Ministry of Defence before recovering the ship’s bell from HMS *Hood* in 2012. After discovering the wreck of the *Titanic* in 1985, Dr. Robert Ballard proceeded to film the wreck of the battleship *Bismarck* without first obtaining the permission of the Federal Republic of Germany and received the following reprimand for his trouble. (Translation):

*The Federal Republic of Germany considers itself the owner of the former sovereign Battleship Bismarck. Diving excursions to the interior of the wreck as well as recovery attempts require consent of the Federal Government. This has been categorically denied in other cases of sunken ships of the World Wars, because one must expect to find remains of the dead in the wreck. The Federal Republic feels it is its duty to protect the seamen who went to their death in the sinking of the ship. Following international customs, we view the wreck of the Bismarck as a seamen’s burial site that must be accorded proper respect.*

Lest we forget.

### Canadian Aviation Hall of Fame
**Belt of Orion Award**
**The Royal Canadian Naval Air Branch**

In the coming months, formal announcements of the award of the prestigious Canada Aviation Hall of Fame *Belt of Orion Award* will be released to aviation media across Canada. The recipient of this award will be “*The Royal Canadian Naval Air Branch*”. The genesis of this particular award is something that should be of interest to all past and present members of the naval air community but also to all of the current and past naval personnel who have worked so closely and so effectively with naval aviation of their day.

In the late spring of 2007, with the Canadian Naval Centennial looming, **Commander Owen K. (Bud) MacLean** flew one of his typical trial balloons at a gathering of fellow naval aviators over a beer and lunch at a local Orleans watering hole. His idea was to find a way to commemorate what he described as “the incredible accomplishments of the RCN Naval Air Branch” during the turbulent period from 1945 to 1970. Bud was concerned that Canada’s Naval History would not adequately recognize the role played by our Naval Air Branch and he concluded that an initiative on our part was not just warranted but necessary.

With his usual thoroughness and vision, Bud set his
sights on submitting the Royal Canadian Navy Air Branch to the Canadian Aviation Hall of Fame for their award of the prestigious Belt of Orion as one of the eleven Hampton Gray VC, CNAG Naval Centennial initiatives. This singular, national honour was awarded most years to recognize organizations, groups, societies or associations who had made outstanding contributions to the advancement of aviation in Canada. Previous recipients such as Trans-Canada Airlines (1974), Canadian Pacific Airlines (2013), the Snowbirds (1994), CF Search and Rescue (1998) and the Aerospace Engineering and Test Establishment (2005) were national icons and Bud felt it was precisely the award to preserve for posterity the unique and extraordinary accomplishments of the RCN Air Branch in the aviation annals of Canada.

How Bud MacLean came to care so deeply about this project is not surprising, certainly not to those of us who had the pleasure of knowing and serving with him in his 29 years of uniformed service and later in industry. Bud, as the driving force and principal architect of the submission, had been one of the first two naval aviators to be highly decorated under the new Canadian Honours and Awards System and he personally experienced much of what he wrote about in what was a monumental and purposeful sifting of historical material. He was intimately involved from early days in operational flight from aircraft carriers and destroyers, and mastered many of the aircraft types and all of the challenging operational conditions that earmark anti-submarine aviation at sea and are the subject of this submission.

In his long career, encompassing service as an enlisted aircrew specialist right up to Command of an operational squadron, he was personally involved in many of the important technical innovations that so distinguished the Royal Canadian Naval Air Branch from those of its allies. He spoke with the indisputable veracity of one who was there to witness, to participate, to be a part of - to live through, (including a ditching at sea) - many of the significant events and innovations that are so well described in the submission. He also worked with, and later served widely in Canada’s aviation industry so his understanding and appreciation of the critical interface between the two domains was well developed and soundly based on personal experience.

Over the course of the next few years, he approached many naval air colleagues and military historians and, encouraged by their support and enthusiasm, gathered together a team. Under his leadership, Stu Soward, Dave Tate, Gord Moyer, Ted Forman, Bob Falls, Paul Manson, Larry Ashley, Peter Milsom, Paul Baiden and Dudley Allan began the task of telling the Naval Air Branch story. Everyone realized that this might become a long term project but no one knew the extent of the challenge. The first submission to the CAHF targeted the Belt of Orion award for 2010. The protocol of the Hall of Fame was that a submission, if rejected, would remain on the books for 4 additional years and after that time the nomination would cease.

Bud was hugely disappointed when 2010 passed without success. And, the project seemed doomed with failure in the following 4 years. But in 2014, the Hall of Fame recommended that the RC Naval Air Branch submission be updated and re-submitted. By this time Stu Soward, Gordie Moyer, Ted Foreman and Bob Falls were in the Delta but with their inimitable spirit at hand, Bud and his team, augmented by Dr. Rich Gimblett, the RC Navy Command Historian, made their final submission. Sadly, Bud did not see the final success of his major undertaking as he entered the delta in June of this year, followed in October by Dave Tate. The announcement of the award of the Canadian Aviation Hall of Fame Belt of Orion for 2016 to the RCN Air Branch was made on 30 November, 2015.
The success and accomplishments of the RCN Air Branch through the years 1945 to 1970 was the product of operational savvy, technological vision, courage, risk taking, team work, high level sustained professionalism, dedication and individual and collective leadership. The contribution that the Air Branch made to the RCN in the accomplishment of its missions and to Canadian industry and to Canada and her Alliance partners during a challenging time in global history was extraordinary. The award of the Belt of Orion is testament to that achievement. This initiative was a CNAG Naval Centennial initiative, as was its Historic Sites and Monuments Board historical plaque initiative. Both were undertaken on the behalf of all Canadian naval aviation personnel past and present. To all members of the Royal Canadian Naval Air Branch, the prestigious Belt of Orion is your award!

A CAHF ceremony will take place on 9 June, 2016 in Ottawa at the Canadian Aviation and Space Museum. Details of the ceremony will be promulgated throughout the community once known. It is hoped that naval aviation will be strongly represented at the dinner and ceremonies.

Larry Ashley, Peter Milsom and Paul Baiden S

REMEMBER
By Pat Barnhouse

Active Members

Kenneth MacKay MEIKLE, Commander, CD*, RCN(Ret’d). In Ottawa 26/01/16 at 90.

James Sterling FERGUSON, Lieutenant Commander, CD, RCN(Ret’d). In Port Moody, BC 22/01/16 at 68.

Others Known to Members

David BEDFORD, Lieutenant Commander (Ret’d), CD*. In Ottawa 24/10/15 at 53.

James MacArthur BIRD, Lieutenant Commander(L), CD, RCN(Ret’d). In Ottawa 05/12/15 at 95.

Alistair Gordon CARR, Lieutenant Commander(L), CD, RCN(Ret’d). In Ottawa 13/09/15 at 92.

Douglas A. CAUDLE, Chief Petty Officer (EA), CD, RCN(Ret’d). In Ottawa 11/02/16 at 88.
Peter McCaul CORNELL, Commander, CD, RCN(R)(Ret’d). In Ottawa 25/01/16 at 89.

John COUGLAN, Chief Petty Officer 2nd class, CD*, RCN(Ret’d). In Ottawa 23/12/15 at 88.

Erwin Gerard DALY, Lieutenant, RCNVR(Ret’d). In Ottawa 23/01/16 at 95.

Jeffrey Amhurst HALE, Sub Lieutenant, RCNVR(Ret’d). In Ottawa 07/02/16 at 91.

David Smith LOCHEAD, Lieutenant Commander, CD*, RCN(Ret’d). In Winchester, ON 08/01/16 at 86.

Glen Patterson MacPHERSON, A/Lieutenant, RCN(R)(Ret’d). In Ottawa 30/01/16 at 79.

Herbert Charles MONTGOMERY, Lieutenant, RCNVR(Ret’d). In Ottawa 09/01/16 at 95.

Bryan ORMSBY, Chief Petty Officer 1st Class, MMM, CD**, RCN(Ret’d). In Ottawa 13/03/16 at 73.

Charles V. W. ROLFE, Chief Petty Officer 1st Class, CD**, RCN(Ret’d). In Ottawa 26/02/16 at 81.

Norman Leslie SMITH, Chief Petty Officer 1st class, CD, RCN(Ret’d). In Ottawa 28/01/16 at 75.

George Herbert SQUANCE, Chief Petty Officer 1st Class, CD, RCN(Ret’d). In Ottawa 08/10/15 at 95.

David John STATHAM, Commander, CD**, RCN(Ret’d). In Ottawa 27/02/16 at 74.

Laurent Joseph Theophile THIBAULT, Lieutenant Commander, CD, RCN(Ret’d). In Ottawa 10/03/16 at 89.

Roger James WILSON, Commander(NR)(Ret’d), CD. In Ottawa 21/11/15 at 82.
Drum
By Richard Archer

Did I ever tell you the story of the time I was interviewed on the CTV news program W5? It was 1976 and I was in command of HMCS Fundy, an ex-minesweeper based in Esquimalt and involved in junior officer training. The ship had the new designation of Patrol Frigate Light or PFL. Myself and the other commanding officers of the three other ex-minesweepers in our tightly-knit group thought of ourselves as “piffle-drivers”.

The Drum episode all started just after the four ships had moored in the port of Astoria, Oregon, at the mouth of the Columbia River. We were there at the invitation of the local organizing committee for the annual Astoria Regatta (I still have the commemorative silver tray.) We’d all been to Astoria before, but only as a stopover enroute to the Portland, Oregon, Rose Festival (that’s another story…) -- a day’s voyage up the river.

Our normal operating area was amongst the Canadian Gulf Islands, the US San Juan Islands and adjacent navigable waters protected by Vancouver Island. On occasion we did get as far south as Olympia, the capital of Washington in Puget Sound, and as far north as Ocean Falls on the BC coast. It was a great life and the training and exposure to the Navy we gave the students was invaluable and the results were highly rewarding. We were given carte blanche by CANCOMTRAINRON to go wherever we wished within limits, and within the time scales and objectives of the MARS III, MARS IV, DNO and other training programs. We did take advantage to visit our favourite port, Vancouver, whenever circumstances allowed.

It was all so ad hoc. Technically, the six ex-minesweepers from which four were in use at any one time (I personally had command of Chaleur, Miramichi and Fundy at different times) were in reserve and not commissioned. Given that the ships were unofficial, the crews from the captains on down were all borrowed from the books of the training squadron. A shortfall was that we only had two instead of the normal three watches of stokers. The head of the engineering department was a CPO2. The two watches meant that we normally berthed or anchored somewhere each night.

So the voyage out the Strait of Juan de Fuca and down the coast to Astoria and Portland was an adventure of a couple of days’ duration – we could only do it occasionally. Yes, the seas were also a bit rough, and the long Pacific rollers were generally on the beam. But the steepest seas I’ve ever seen were when we stopped to pick up the pilot at the entrance to the Columbia River, where we crossed a shallower bar and the Pacific rollers came up against the massive outflow of the river. My tossing ship felt very small.

But once safely alongside in Astoria, I had a chance to go over the day’s message traffic. One message caught my eye – an alert from the US Coast Guard to keep a lookout for the sailing vessel Drum, missing on a voyage from Hawaii to Puget Sound. Now, this actually rang a bell. I recalled noting the name Drum on a sailing vessel I had seen some weeks before in Haro Strait, between southern Vancouver Island and the San Juans. I duly sent a message to the naval HQ in Esquimalt reporting my recollection.

The next day I received a telephone call – the local US Coast Guard base was sending me a car because the USCG district admiral wanted to talk to me. In his
office all I could do, however, was to repeat my hazy memory of seeing a *Drum* in Haro Strait. That seemed to be the end of it.

A week or so later we were back in Esquimalt. Out of the blue I received a call from someone identifying himself as a producer for W5. The program was doing an article on the proposition that drug cartels were hijacking sailing vessels, tossing the sailors overboard, and then using the vessels to transport their drug shipments to North American markets. Apparently, the *Drum* was a candidate example. I did the right thing, and referred him to the public relations authorities in Pacific Command.

A few days later I got a call from those PR authorities. The story was that the Washington, DC-based parents of their son and his wife, who had been bringing *Drum* from Hawaii back to the continental US, had been actively campaigning for more action by the USCG to find out what had happened to the vessel -- hence my interview with the USCG admiral. They had also expanded their campaign to Canada, and had somehow engaged W5 in their efforts.

The upshot was that some days later I hosted the parents in *Fundy*'s wardroom. They were accompanied by a Navy PR representative and a woman who was the marine reporter for the Victoria *Colonist*. The W5 producer and his camera crew remained outside, because the parents had asked for a private interview with me away from the cameras. They showed me a picture of the *Drum*, and asked several questions about what I recalled. My heart went out to them, but regrettably I couldn't contribute much more than I had already reported.

Next we all went outside and on *Fundy*'s gun deck in front of the W5 cameras the parents asked me more or less the same questions and I had to give the same answers.

A couple of weeks later I watched the piece on W5 – I got about 30 seconds, and the narrator mentioned my contribution as a “possible sighting”. The overall report on the prospect of drug-related hijackings of sailing vessels was of course very inconclusive. From my point of view there could be several reasons for the disappearance of a small sailing vessel, not least, of course, is the possibility of being run down by a freighter during the night. And naturally a question crossed my mind – were there any other yachts named *Drum* among the tens of thousands in the Pacific Northwest? Was it one of these others that I had seen? As far as I know, this possibility wasn’t checked out.

So all in all, it was a very unsatisfactory ending to my involvement in this sad story, and I wanted to put it behind me. I even received a complaint from my Father that I hadn’t told him about the W5 interview and that he had missed it.
Officers, Directors and Appointments 2016-2017
Subject to confirmation at the 2016 AGM

PRESIDENT and CONFERENCES
Smith, H.R. (Howie) [H] 613 286-8555
803-131 Holland Avenue
Ottawa, ON, K1Y 3A2
Email: h.smith@lansdowne.com

VICE-PRESIDENT and PROGRAM, BOA GALA
Addison, T.H. (Tim) [H] 613 841-4180
1681 Des Perdrix Crescent
Orléans, ON K1C 5E2
Email: timaddison@yahoo.ca

VICE-PRESIDENT and RECRUITING
Garceau, A.L. (Alain) [H] 613 569-8716
PH1-260 Besserer Street
Ottawa, ON K1N 1J3
Email: al.garceau@bell.net

PAST-PRESIDENT, ENDOWMENT, AWARDS
Herrndorf, F.W.K. (Fred) [H] 613 226-2964
33 Mapleview Crescent
Ottawa, ON, K2G 5J7
Fax: 613 226-6850
Email: frederik.herrndorf@sympatico.ca

SECRETARY and PROGRAM
Soule, C.J.D. (David) [H] 613 728-4922
1138 Sauterne Park
Orleans, ON, K1C 2N8
Email: dsoulercn14@mail.com

TREASURER
Millar, J.S. (John) [H] 613 830-2829
621 Princess Louise Drive
Ottawa, ON, K4A 1Z3
Email: john.miller@rogers.com

DIRECTOR - MEMBER SERVICES
Baiden, P.A. (Paul) [H] 613 824-1561
702 Clearcres Street
Ottawa, ON K4A 3E6
Email: pbaiden@rogers.com

DIRECTOR – MEMBERSHIP
King, S.E. (Steve) [H] 613 680-4809
517 Fielding Court
Ottawa, ON K1V 7H2
Email: capt_seking@hotmail.com

DIRECTOR – COMMS, CEREMONIES
Leak, N. (Nick) [H] 613 823-1316
47 Stradwick Avenue
Ottawa, ON K2J 2Z9
Email: n.leak@rogers.com

DIRECTOR – OUTREACH
Sanford, W.J. (Wendell) [H] 613 744-4269
32-39 Putman Drive
Ottawa, ON K1M 1Z1
Email: wendell.sanford@yahoo.ca

DIRECTOR – SALTY DIPS
Guitar, R.J. (Rick) [H] 613 834-2171
6906 Edgar Brault Street
Ottawa, ON K1C 1L7
Email: rrjguitar@rogers.com

DIRECTOR - ENTERTAINMENT
Paterson I.A. (Ian) [H] 613 421-3938
415 Richardson Avenue
Ottawa, ON K2B 5G7
Email: ianpaterson54@hotmail.com

DIRECTOR - HISTORY
Gimblett R.H. (Rich) [H] 613 830-8633
49 Southpark Drive
Ottawa, ON K1B 3B8
Email: richard.gimblett@rogers.com

DIRECTOR - RCN LIAISON
Hudock D. [Dave] [H] 613-422-2489
572 Bathurst Avenue
Ottawa, ON K1G 0X8
Email: dhudock@pcl.com

DIRECTOR CONFERENCE SUPPORT and PROGRAM
Barber, MJM (Josh) [H] 613 823-1723
19 Kane Terrace
Nepean, ON K2J 2A3
Email: joshbarber39@gmail.com

DIRECTOR PROGRAM
Avis, P.C. (Peter) [H] ---
2C-210 Cumberland Street
Ottawa, ON K1N 9K8
Email: avispca@hotmail.com

DIRECTOR-AT-LARGE
Walker, R.B. (Barry) [H] 613 408-7071
6087 Marquette Avenue
Ottawa, ON K1L 8A7
Email: rbarrywalker@me.com

NON-VOTING APPOINTMENTS

EDITOR SOUNDINGS
Archer, R.F. (Richard) [H/Fax] 613 270-9597
12 Zokol Crescent
Kanata, ON K2K 2K5
Email: richmar.archer@rogers.com

WEBMASTER
Bush, R. (Bob) [H] 613 839-3861
108 Sierra Woods Drive
Carp, ON K0A 1L0
Mobile: 613 668-3672
Email: robertbusharl@aol.com

MACK LYNCH LIBRARY
McAte, P. (Peter) [H] 613 729-3766
#1 Summershade Private
Ottawa, ON K1Y 4R3
Email: petermace@sympatico.ca

Soundings May 2016
Naval Association of Canada - Ottawa

Membership Directory

A Directory is enclosed with each autumn issue as an aid to our membership. However, its accuracy depends on how we are advised about errors, changes and additions. We now have most members who are on the Internet and with whom the Branch can communicate with ease -- a magnificent medium for the rapid movement of information. Please advise your Membership Chair, Steve King, of changes to your email address. When email messages are bounced you are removed from the network.

Soundings

This newsletter was founded in 1982. It is published twice a year, normally in May and November, reporting on NAC - Ottawa programs and activities, trends and other matters of interest to its members. This and previous editions are posted on the branch web site:

http://navalassoc.ca/branches/ottawa/soundings

The Editor is solely responsible for the contents. Items from Soundings may be reproduced by other publications providing credit is given to Soundings, NAC-Ottawa, or any by-lined author.

Contributions, input, feedback, ideas, anecdotes, naval signals, trivia, reminiscences, humour, salty dips, good and bad news items, comments and letters to the Editor are welcome and invited.

Submissions by email (preferred), telephone, mail, fax, CD or memory stick are welcome. Electronic document files should be converted to WORD format before transmission to the Editor. Images should be in jpeg format. Please remove all automatic formatting!

Soundings returns in November 2016. Please send contributions to the Editor by September 30th, 2016.

Mailing Address: Richard Archer, Editor Soundings, 12 Zokol Crescent, Ottawa, Ontario, K2K 2K5. Phone/fax: (613) 270-9597, or preferably by email at: richmar.archer@rogers.com.

Production Notes: Soundings is produced by the Editor using his personal computer word processor. It is printed commercially by Postlink Corporation, 1475 Star Top Road, Ottawa, ON K1B 3W5. Phone 613 741-4538, or email to Leonard Mandel at postlinkcorp@gmail.com.