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Maritime Engineering Journal

Canada's Naval Technical Forum



Since 1982

Summer 2019



Special Feature

A Canadian Naval Technical Exchange Experience
in the American Deep South



Canada

RAdm Simon Page Promotion



Congratulations to former RCN Senior Naval Engineering Advisor Simon Page on his promotion to rear-admiral in May. Pictured here receiving his new epaulettes from his wife Sherrielynn Mullins and Chief of the Defence Staff Gen. Jonathan Vance, RAdm Page will take up a new appointment as Deputy Chief of Staff for the Materiel Group in Ottawa. News of his promotion made quite the splash during the Naval Technical mess dinner in Halifax in May.



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The launch of USS Ralph Johnson (DDG-114) at the Huntington Ingalls
Industries Shipyard in Pascagoula, Mississippi.

(Photo courtesy LCdr Brennan Blanchfield)

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COMMODORE'S CORNER

The Importance of Mentorship and Knowledge Transfer

By Commodore Christopher Earl, CD

I had an eye-opening opportunity in early May to travel to Calgary to represent the Royal Canadian Navy (RCN) at Battle of the Atlantic ceremonies there. Hosted by the reservists, who represent the entire complement of HMCS *Tecumseh*, the remembrance weekend was filled with activities that included a mess dinner, a visit to a Royal Canadian Legion branch south of the city, and numerous engagements with media, reservists, and several young cadet groups – followed by the Battle of the Atlantic remembrance ceremony itself.

Several thousand Calgarians braved the snow and cold to show their support for the handful of Second World War veterans attending the ceremony and to honour those no longer with us. Although I come from the Calgary area, I was absolutely astonished and delighted by the level of support that our Navy has in that land-locked region of our country. Throughout the weekend, I was constantly asked by people in and out of uniform what it was like to be in the Navy, to be an engineer, and to spend time at sea in a submarine. These young reservists and cadets, some as young as eight or nine, were incredibly enthusiastic about the Navy, but, not being near the ocean, they needed someone with first-hand experience to answer their questions. They yearned for this information, prompting many of the discussions and interactions, and this led me to think about the topic of mentorship and knowledge transfer.

Depending on when you look at the statistics, the RCN is somewhere between 10 and 15 percent under strength. Within the technical occupations, shortages are approaching 25 percent at some rank levels and, with the imminent arrival of HMCS *Harry DeWolf*, it should be no surprise that returning to authorized strength is a priority for the RCN. While this means opportunities for many of the reservists and cadets I had the privilege to meet in Calgary, and advancement for young sailors already in uniform, it also means a huge demand for rapid skills development in all of our technical trades. One of our biggest challenges will be to transfer the expertise we have amassed during our time in uniform. We must start downloading our



Photo by Kevin Moffat

knowledge now if we are to meet the demands that many among us believe are already here. My challenge to you is to make mentoring a priority.

Mentorship has long been recognized as an effective means of knowledge transfer. It's a way to pass on skills to the next generation, and to produce productive, highly competent, and safety-minded individuals who can work in a complex and dynamic environment. Regardless of your background, or where you are in your career, many of the skills that you currently possess are the result of the interactions, or mentorship, that you have received along the way. Mentors provide knowledge, experience, advice, and different viewpoints – often using examples from their own careers. They can help you evaluate where you are now, where you want to go, and how to get there. They can give you a broader insight and help you learn things that would probably take you longer to figure out on your own. Thus, they ultimately can help you achieve your goals more quickly and effectively than working alone – an important cog in the operation of any successful organization.

Everyone reading these words has expertise that can be passed along. A good mentor is interested in helping others achieve their goals, is someone who takes the time to explain why, and is entirely honest and reliable when providing advice. With good mentorship comes trust and with trust comes knowledge transfer. The opportunities are endless and the concept can be applied anywhere. Whether at sea in a ship or submarine, within the Fleet Maintenance Facility, or in a technical support role in Ottawa, opportunities are endless. So, reach out to someone, attend a seminar or conference, or simply just decide to learn something new by asking for some advice or help. Develop yourselves so you can develop others. We will be a stronger organization because of it.

In closing, I would like to acknowledge that the naval technical community has recently lost two great mentors. I met VAdm Stephens when I was stationed in the United Kingdom and regularly chatted with RAdm Christie at the naval technical mess dinner held annually in Ottawa. Their stories will be told separately in this issue but I wanted to mention that my interactions with them inspired me and gave me some insight into Cold War shipbuilding/repair that otherwise I might never have understood. Let's all commit to being the type of people they were and ensure that the knowledge we have garnered over our careers gets passed on to those that follow.



"Mentorship has long been recognized as an effective means of knowledge transfer...a way to pass on skills to the next generation"



FORUM

Farewell to Two of the RCN's Finest

The RCN's naval technical community bid farewell to two long-retired engineering flag officers when **VAdm Robert Stephens** and **RAdm William Christie** died one day apart on April 9 and 10, 2019. Both officers had fulfilled distinguished naval service and follow-on civilian careers, and were active mentors in their respective naval engineering communities throughout retirement. As saddened as we are to have lost them, we are fortunate in that both officers had previously given detailed interviews to the Oral History Project of the Canadian Naval Technical History Association (CNTHA). A synopsis of these interviews can be found in the CNTHA newsletter on page 27. — **Editor**

Obituary

Vice-Admiral Robert St. George Stephens carried on a distinguished family tradition

By Capt(N) (Ret'd) Rolfe Monteith (A friend and colleague)

Bob Stephens was born into a naval family in Esquimalt, British Columbia on January 17, 1924. His father George, a native of Plymouth, England, had joined the Royal Canadian Navy as an apprentice engineer during the First World War, and retired in 1946 as the RCN's Chief Naval Engineer with the rank of rear-admiral.

Bob himself joined the RCN in 1941 as a naval cadet, and served with the Royal Navy throughout the Second World War, qualifying for a degree in marine engineering, and operationally participating in Arctic convoys to Russia. After the war, because of his high academic standing, Bob was selected for and obtained a post-graduate degree in engineering. He would later do an operational tour in Korea aboard HMCS *Huron*, and following promotion to captain was selected to attend the one-year course at the Imperial Defence College in London. A series of demanding

naval appointments followed, concluding with his final appointment as a vice-admiral as Canada's Military Representative to NATO HQ in Brussels.

Following his retirement from the services in the late 1970s, Bob enjoyed a period of work in the commercial world in Canada before he and his wife Clotilde emigrated to England. Bob played a significant role in the creation of the "Admirals' Medal," established in 1985 in conjunction with the RCN's 75th anniversary. Named in honour of RAdm George Stephens, RAdm Victor Brodeur and VAdm Rollo Mainguy, the medal is awarded annually to those who make outstanding achievements in the advancement of maritime affairs in Canada.

On a personal level, Bob was a devoted husband and father to a daughter and three sons during his naval career. Yet in retirement, he and his wife Clo experienced the ultimate sadness of losing children — their daughter in Mozambique, and a son in the United Kingdom. Bob and Clo were faithful attendees at St. Mary Magdalene Church in Madingley.

While committed to the Navy and his family, Bob found time to publish in 2011 a most remarkable book on the history of his family. His personal collection of poems was documented in 2002 under the title, "Leaves in the Wind."

Robert St. George Stephens was a fascinating mixture of warrior, historian, raconteur and poet. He died on April 9, 2019, closely following Clotilde's funeral on March 29.



Photo by Brian McCullough



**The following is an abridged and edited version of the tribute delivered by
Cmdre Marcel Hallé, DCOS Plans – Allied Maritime Command, Northwood (NATO),
to those attending the funeral service for VAdm Stephens in Cambridge, UK on May 29, 2019.**

On behalf of the Commander of the RCN, VAdm Ron Lloyd, the Assistant Deputy Minister (Materiel), RAdm (Ret'd) Patrick Finn, and in my capacity as a former Chief Engineer of the Navy — it is an absolute honour and privilege to be giving the Navy's address to such a fine naval officer, a brilliant engineer, and a true Canadian.

It is wonderful to see Captain (Navy) (Ret'd) Rolfe Monteith with us here today. He is a 1941 Royal Naval College Dartmouth contemporary and dear friend of VAdm Stephens, and another great Canadian naval engineer in his own right.

To many, VAdm Stephens will be remembered as a mentor, profoundly shaping and influencing the careers of many, and through that, shaping and influencing the course of the Navy, in particular the post-war transition to the fleets that would follow, right up to and including our current *Halifax*-class frigates. Of interest is the early work he did as the Director of Marine and Electrical Engineering in Ottawa when he combed European industry to research the feasibility of powering ships with gas-turbine technology.

Following in the footsteps of his father, who gallantly served as Chief Engineer of the Royal Canadian Navy throughout the Second World War, the Admiral leaves behind a prestigious legacy of his own as a veteran of both the Second World War and the Korean War. Throughout his career, as a naval engineer in Canada, he was a man of many firsts: He was the first to undertake nuclear engineering as a lead-up to Canada potentially acquiring nuclear submarines, and was the force behind creating the Naval Engineering Test Establishment in Montréal, which in its 66th year continues to be a jewel in the Canadian naval engineering crown. He was the first, and to this day the only, Canadian naval engineer to have been promoted vice-admiral, and was the first and only naval engineer to serve as Canada's Military Representative to NATO in Brussel's, the appointment he would retire from.

To appreciate the Admiral's achievements over his lengthy career requires an understanding of the historical

context in which he served. He was instrumental in building Canada's post-war fleet, bringing innovative pragmatism into the building of the destroyer escort ships and the steam technology they relied on. He was not one to compromise on standards, and his demand for quality to ensure the best for our ships and sailors would be a trademark throughout his career.

I did not know Admiral Stephens well, but he had a profound impact on me and many other naval engineering officers because the course that he set, in many ways, has endured. In reading his 2008 CNTHA interview, I was able to connect and identify with much of what he did, having had similar experiences myself. What struck me most was the faith he placed in people, be they his superiors, peers or subordinates. When he was appointed as Commodore of the Dockyard in Halifax, he was responsible for a large and heavily unionized civilian workforce. What captivated me was what he had to say about them, stating, "I had been led to believe that the workmen were rather lazy and not very good. I didn't find that at all. I found that if you treated them well, they responded well." More than thirty years later I would work in that very dockyard with that civilian workforce, and I can say that truer words were never spoken.

Admiral, you have left a tremendous legacy from the time you served and for what you continued to do in retirement. Your passion, compassion and love for the Navy were clearly evident and recognized by all. We gather here today and "pipe the side" for the last time as you depart us for brighter and calmer seas. As you are now reunited with your bride, may your voyage together be everlasting.

Mon Amiral, your family, this country, all Canadians, currently serving and former military members and your friends owe you a debt of gratitude for all you've done, and on behalf of them all I extend a heartfelt thanks and bid you safe journey.



FORUM

Obituary

Rear-Admiral William Borden Christie
(1919-2019)

The Royal Canadian Navy, and the naval technical community in particular, lost a great leader, colleague, mentor and friend with the passing of Rear-Admiral William Borden Christie in Ottawa on April 10 at the age of 99. His gentlemanly presence at local naval events was always something to be appreciated.

RAdm Christie's entire life and career reflected his love of the sea and ships — sailing with the British and Canadian Merchant Marine in his youth, serving a long and distinguished career in the Royal Canadian Navy, sailing small boats on the Ottawa River, and enjoying the company of other mariners and engineers.

Born in Calais, Maine on September 20, 1919 and raised in Digby, N.S., the young Mr. Christie indulged his love of the sea by joining the Merchant Marine in 1936 as a radio officer in British and Canadian vessels. He enlisted in the RCN in 1941, and when the Second World War ended, continued his naval career in peacetime. He saw service as Electrical Officer aboard HMCS *Nootka* during the Korean War, and was later involved with ship system design and construction, particularly with the aircraft carrier HMCS *Bonaventure* and the build of the *Oberon*-class submarines in the United Kingdom.

In the late 1960s, RAdm Christie commanded HMC Dockyard Halifax and CFB Halifax. He went on to become Chief of Engineering for the Canadian Armed Forces at National Defence Headquarters in Ottawa, and then served as Associate Assistant Deputy Minister (Materiel). He retired from the Canadian Armed Forces in 1974, at which time he took on a five-year assignment as Director General of the Shipbuilding Branch of the former Department of Supply and Services (DSS).

Following his military and public service careers, RAdm Christie took on the role of Director of Business Development with Canadian Vickers Limited, then served as president of three Ottawa-based companies successively: Versatile Systems Engineering Inc., YARD Inc., and VSEL



Photo by Brian McCullough

Defence Systems Canada. He was a graduate of Dalhousie University and the Nova Scotia Technical College in Halifax, as well as the Imperial Defence College in London, England.

As an avid sailor for most of his life, Bill was a past Commodore of Ottawa's Britannia Yacht Club. He also chaired area chapters of the Society of Naval Architects and Marine Engineers, the Engineering Institute of Canada, and the Naval Officers Association of Canada.

RAdm Christie was predeceased by his wife Maxine, and is survived by two sons and a daughter, as well as many grandchildren and great-grandchildren. His family requested a private interment at Ottawa's Beechwood Cemetery.



FORUM

Royal College of Defence Studies, London — An experience not to be missed

By Capt(N) David Benoit
Photos courtesy the author



In the Naval Technical Officer occupation today, we are fortunate to have many diverse opportunities for serving our country and the Royal Canadian Navy through out-of-Canada “OUTCAN” postings. No matter what the destination, or whether the excursion to a foreign land is to fill an exchange billet or to pursue postgraduate education, returning officers invariably report that their experience has been both professionally rewarding and full of adventure.

In my case, I had the pleasure of attending the Royal College of Defence Studies (RCDS) in London, England from September 2017 to July 2018. The course is the National Security Program as delivered by the UK Ministry of Defence, and what made it all the more enjoyable was that I had my wife and daughters along with me in London while I was on course. As a family, we were able to experience the richness of the college environment, the enjoyment of the location, and the growth that comes with international travel and exploration.

The RCDS is located in a grand, former manor house built in the 1800s by a merchant in central London’s Westminster area. The course itself was created following several years of advocacy by Sir Winston Churchill, based

on requirements he discerned during his First World War experiences. The first course was delivered in 1927, and since then Canada has sent at least one representative each year. While initially conceived as a military course, from the outset, it has included public servants and diplomats. Seventy-odd years later, except for a brief hiatus during the Second World War, the course now attracts some 100 candidates annually — about 70 percent of whom come from outside the UK. Course participants have included military personnel, public servants, politicians, a member of the House of Lords, diplomats, business executives and law enforcement officers.

The course turned out to be less about military affairs and more about international issues relating to global relationship building and the development of grand strategy across/between governments, and how to engage the political, diplomatic, economic, and technological aspects of a nation’s power in a coherent and comprehensive way. The program’s description of big ideas initially both intrigued me and gave me pause, but the reality of being among a dynamic and culturally diverse group of people thrown together in such an amazing setting turned out to be an unexpectedly engaging journey into areas that



The author with his wife Jacqueline at Buckingham Palace. Spouses were welcomed at a number of official course events.

were entirely new to me. Over the 10 months of the course I would have opportunity to visit the northeast region of the UK — an area that reminded me of the east coast of Canada in terms of its topography, as well as its economic, social, and environmental challenges — and travel to the Middle East.

The first term was interesting in that, if you arrived at the course as a card-carrying pessimist, full of worry for the future, nothing we learned during those first weeks would make you change your mind. If you arrived an optimist, by the time the first term was over, you were undeniably aware of the global pitfalls the world is facing. We talked about artificial intelligence and its promises and dangers; global warming and its most likely effects; humanitarian crises; migrant challenges; the impact of our social media choices; real politik; gender politics; the role of the soul in today's environment; religion; international organizations (UN, NATO, World Bank) and the differences between customs, cultures, and political systems represented by our class. For each discussion, we had a world-renowned expert present for about 45 minutes, following which we went into an hour-long question period. Hearing the participants — each with their own cultural experience, bias and perspective — interpreting the discussion and seeking clarification and enlightenment was well worth the price of admission. These aspects were the most interesting, and kept the conversation lively among the participants and staff well after the lecture had ended.

The course also investigated how to develop grand strategy, and we experienced first-hand the difficulties of working outside our comfort zones. The class also had the fun of participating in a major exercise where we played the role of cabinet ministers under a head of government for a final two-week period as we focused on each other's countries as well as world events. Participants had to understand their assigned country's culture, economics, political values, and national interests and, while remaining true to these, take action while employing international diplomacy. Realism was injected into the scenario as we were confronted with seemingly real-world events, live news reports, and journalists unexpectedly asking you questions "on the record." These interviews were then played back to the horror and amusement of all of us. As would be expected in the real world, individual countries would react to these inputs from their own national perspective.

Prior to the final exercise, the course was divided into groups to engage around the world. I was selected to spend three weeks in the Middle East, visiting Lebanon, Jordan, and Israel, as well as staying briefly in Palestine. Happily, there was time to do "touristy" things such as floating in the Dead Sea, spending the night in the desert, touring the heart of Lebanon, and experiencing life in Tel Aviv. But the bulk of the assignment was spent meeting very senior government and opposition officials, professors, students, industry and religious leaders, and talking to think tank intellectuals. In Jordan, we were granted an hour-long audience with His Majesty, King Abdullah II, who traces his ancestry to Mohammed, and in Lebanon met with President Michel Aoun. Much to our delight, both of these sessions ran twice as long as what had been planned for us. We also paid a visit to the largest mosque in Jordan where we had an Arab Catholic priest and an Imam talking to us,



Visits like this one to the United Nations in New York allowed a few moments of fun, but were real eye-openers in understanding the complexities of international relations.

side by side, in a mutually friendly and familiar manner. It was truly astounding to hear their combined message of tolerance, peace, and reconciliation. When visiting Israel's Knesset, we were treated to a passionate presentation about minorities in the region by Aida Touma-Suleiman, one of the few female Arab-Israeli citizens elected to parliament, who was also chair of a senior committee.

The year on course focused on professional and personal growth in all forms. One of the most memorable experiences for me was the creation of an impromptu college band we called "Soft Power." While we performed mainly for our own enjoyment, our players from Australia, the UK, Ukraine, Hong Kong, Finland, France and Canada also enjoyed playing for our other course mates. While it may sound trivial, the effect it had on the course was discernible in bringing us all closer together as a group.

Our chosen career provides an opportunity to develop a broad professional network and to get to know many people in a short time. Even in the UK, my wife and I were already acquainted with the Naval Attaché, Capt(N) Moe Aucoin and his wife Chantal (a retired Nav Eng); the Deputy Naval Attaché, Cdr Corey Bursey and his wife; and Defence Attaché, BGen Denis Thompson. "Captain Moe" was instrumental in enabling my wife Jacqueline and me to host a reception on the rooftop of the High Commission for staff, course mates and their partners on a wonderfully sunny and warm early summer evening. Watching the sun set in the heart of London overlooking Trafalgar Square gave even the Brits an experience that was unique.

As course members we enjoyed a number of singular events, including a mess dinner aboard HMS *Victory* for Trafalgar Night, and were accompanied by spouses and partners at a formal dinner at the RAF Museum seated under the wings of a Lancaster bomber, a reception in the Tower of London and a formal dinner at Drapers' Hall.

As mentioned, along with the course and school demands there was time for family fun. Our adventure started with taking the Queen Mary 2 from New York to Southampton. This seven-day passage, after our whirlwind and hectic efforts to prepare for a year's absence, was exactly what the family needed to transit from our comfortable life in Canada to the unknown. Once settled into our house in the Mews – complete with a front garden – train rides to sites all over the UK, a visit to Paris and flights around Europe were the norm for every weekend and school break. In addition to frequenting the usual tourist areas, we also found quiet cafes, hidden alleys, surprising



The band "Soft Power" looking very cool.

sights, and fantastic getaways. While there were many memorable moments, walking through the streets of London from St. Paul's Cathedral to Westminster on Christmas Eve, standing and watching the New Year ring in on the Thames in front of The Eye (London's giant Ferris wheel), walking through the gates at Buckingham, running through Hyde Park, and attending a Rolling Stones concert stand out as highlights.

As with any year, there were the usual trials and tribulations adjusting to a new school, getting familiar with a different curriculum, getting used to different cuisine and learning different customs. Overall, however, we forged together as a family and persevered in making the most of our short time in an adopted country.

While out-of-country postings present a wonderful opportunity for growth and development, the key is to approach them with optimism, a sense of excitement and a dose of realism. While away from home, consider how each experience can shape your thoughts and actions for the betterment of your career, and to the benefit of the Royal Canadian Navy.



Capt(N) David Benoit is Commanding Officer of Fleet Maintenance Facility Cape Scott in Halifax.

FORUM

Uniforms of Many Colours — My World of Sports and Navy

By A/SLt Cassandra Labrie

For as long as I can remember, sports have been the main focus of my life. As a youngster whose parents got me started at a pretty young age with swimming, soccer, gymnastics, and skating I had no idea that the discipline and teamwork I was learning would one day provide me with skills that would help train me for a career in the Royal Canadian Navy (RCN).

It wasn't until I was nine years old that I started playing hockey. I remember being jealous of my little brother and how much fun he was having. When my family and I moved to Gatineau following my father's posting — we were a navy family — I really started taking my sports seriously. I realized that they are a great opportunity to get an education and if I worked hard enough, I could maybe even participate in the Olympics!

I spent my high school years playing competitive hockey in the winter and competitive soccer in the summer. During those summers, I would also attend many hockey camps to keep up with my training. I think sacrifice would be the theme of my high school years. It is very time-consuming to be involved in competitive sports while in school. You must be able to find a balance between your school work and your training. After graduating from high school, I played three years of varsity hockey at a CEGEP (a Québec General and Vocational College) while obtaining a science diploma. It was then that I was signed by the Université de Moncton Aigles Bleues at the institution where I had started my Mechanical Engineering degree.

Completing my degree and playing varsity sports is a major challenge. It requires good time management, a stick-to-it attitude and focus. In my second season, I was Assistant Captain of my team and in my fourth year I was named Captain. It was a real honour to be recognized for my leadership abilities and my dedication to my team. This was a wonderful vote of confidence from my coaches and team mates.

In March of this year, I got a call from the coach of the Canadian National Women's University Hockey Team saying she was interested in having me play for the squad that would compete in the Krasnoyarsk 2019 Winter Universiade in Russia. The Universiade is a biennial international

competition for university students and the coach told me she had been following my past two seasons and believed that I would be a good fit. During that call, the only thought going through my mind was that all these years of hard work had been worth it. A week later, I was on a plane for Russia with a team that had just met for the first time at the airport.

When we landed in Krasnoyarsk, there was a crowd of media people and volunteers to welcome us at the airport. We headed straight for the athlete's village, a University campus, and at that point it hit me that this event really was like a mini- Olympics. It was as though my childhood dreams had finally come true! Everywhere we went, people asked to have their pictures taken with us and wanted to chat with us. I was quite impressed at how much people loved the Canadian athletes. If Russia was not competing in an event, everyone was cheering for Canada.

It was an emotional day when we received our Team Canada jerseys before the first game. The atmosphere in the arena during games really was surreal. The stands were always full. Our first game was against China. We won 10-0 and outshot them 93-3. We then were victorious in our next three games against Japan (4-1), Switzerland (8-3) and USA (1-0).

The team to beat was the Russians. All but four of their squad were players on their Olympic team, unlike our





roster that had no one who was on the Canadian Olympic Women's Hockey team. We lost our first game against the Russians 4-2, then in the semi-finals, we played against Japan and won 4-1 to move on to the gold medal game against the home-town favourites.

The highlight of the tournament for me, other than playing in the gold medal game of course, was scoring the first goal in the semi-final against Japan. It was my third goal of the tournament, and it was gratifying to know that I was contributing in such an important way.

For the gold medal game, there were about 2,500 fans in the stands and only about 20 of them were Canadian. The adrenaline of getting ready for a gold medal final contest and trying not to think about the fact that it was my last ever university game filled me with emotions I had never experienced before. We had altered our game plan after having played the Russian team in the round robin and had watched a lot of videos to prepare for the final showdown. The game was very fast-paced and stayed scoreless until about halfway into the third period. It was the first game where Russia didn't score in the first period.

The biggest challenge was to forget about the noise in the building and the pressure of the game. Every time the Russian team got possession of the puck, the whole arena would cheer them on. It was hard to stay focused and not get stressed out about the stakes of the game. I don't know if it was the adrenaline, but a lot of us thrived under that pressure and had the game of our lives. We did end up losing in the finals 2-0 with an empty net goal, but we were extremely proud of our performance.

When I was in my second year at the University of Moncton, I heard about the Canadian Armed Forces Regular Officer Train Program (ROTP). With both of my parents having served in the RCN, and being familiar with the military, I knew it was the career path for me. Much like putting on that hockey jersey, putting on the uniform to go to work is very fulfilling. Knowing that I represented Canada at an international hockey tournament and that I am now at the outset of serving my country in my chosen career is something I am extremely proud of.

I do believe that this experience will help me in my career as a future Marine Systems Engineering Officer. Being able to overcome stress and remaining focused is a big part of the job. We had a Skype call with a sports psychologist during the Universiades and one word that she used repeatedly was chaos. She stressed the importance of being able to perform well and remain positive no matter how chaotic things become. Participating in an international sporting event helps teach a person how to embrace the chaos that we all have to deal with in our day-to-day lives while working through it efficiently and successfully.

When I was younger, I had set many goals for myself: to play for a university hockey team, to wear a Team Canada jersey, and to find a career that I would be proud of and thoroughly enjoy. I am pleased at having achieved those first two goals by becoming captain of my university hockey team and representing my country in women's hockey.

I am now looking forward to starting my career serving my country as a naval technical officer and, by doing so, reaching that third pinnacle of objectives I had set out for myself.



FORUM

A Veterans Services Announcement

The Royal Canadian Legion Veterans Services Network

Did you know that Service Officers care, and can help you, and it will cost you nothing?

Yes, that is true, **free of charge**; the Royal Canadian Legion's Veterans Services Network Service Officers can assist and represent still-serving Canadian Armed Forces (CAF) members, Veterans, RCMP members and their families regarding disability claims or related issues with Veterans Affairs Canada (VAC) and the Veterans Review and Appeal Board (VRAB). We provide free professional counselling and representation services at all levels of the disability claim process under the *Pension Act* or the *Veterans Well-being Act*.

Free Representation Services

Our Professional Command Legion Service Officers provide these services; **free of charge, whether or not you are a member of the Legion**. Our representation role is mandated through legislation. If you would like assistance in preparing your first application to VAC or representation with an appeal to the VRAB, The Royal Canadian Legion Command Service Officer can assist you. We support all who have worn the uniform and those who are wearing the uniform.



Benevolent Assistance

As well, financial assistance is available for all serving and former Canadian Armed Forces and RCMP members and their families who are in distress or have a clear financial need. Grants are available for food, heating costs, clothing, prescription medication, medical appliances or equipment, essential home repairs and emergency shelter or assistance.

If you would like Legion assistance in obtaining VAC disability benefits and services **free of charge** or Legion benevolent assistance, or if you have a friend or family member who needs help, please call 613-591-3335 or toll-free at 1-877-534-4666 to speak with a Service Officer. You can email us at: veteransservices@legion.ca or you can contact a Command Service Officer in your province at <http://www.legion.ca/we-can-help/contact-a-service-officer/>.

The Legion is pleased to offer currently serving and retired Canadian Armed Forces and RCMP members with a free one-year Legion membership, including a subscription to Legion Magazine and access to the Member Benefit programs. Our Veteran Welcome Program, available to all Veterans who have not yet joined the Legion, is a great way to get to know the organization. To apply, please complete the Veteran Welcome Program Registration Form <http://www.legion.ca/welcome>

*"We Care for Veterans of All Ages
and Their Families for Free"*



FEATURE ARTICLE

Pascagoula Shipbuilding Exchange Experience

By LCdr Brennan Blanchfield
Photos courtesy the author



The Huntington Ingalls Industries Shipyard in Pascagoula, Mississippi.

Arriving as an RCN exchange officer (ExO) at the United States Navy's (USN) Supervisor of Shipbuilding (Gulf Coast Command) based inside the Huntington Ingalls Industries (HII) Shipyard in Pascagoula, Mississippi, it was hard not to feel like a young ball player being called up to the Majors. With more than 800 acres of shipyard and almost 11,000 employees, the scope of shipbuilding activities underway is rivaled by only a handful of comparable operations worldwide. At the peak of production during my tour, there were 12 major warships in construction: Six DDG-51 *Arleigh Burke*-class guided-missile destroyers, two *San Antonio*-class LPD amphibious landing platform dock ships, one *America*-class LHA amphibious assault ship, and three *Legend*-class national security cutters for the US Coast Guard.

In 1996, the first RCN ExO to head to Pascagoula was Capt(N) Paul Catsburg (Ret'd). Following his return to

Canada in 2001, he crafted an article for the *Journal* to capture his experience, and it is a must-read (See: <http://www.cntha.ca/static/documents/mej/mej-53.pdf>). Despite the passing of almost 20 years — and six Canadian exchange officers later — Paul's article remains a highly accurate account of the "Goula" experience. To avoid repetition of the salient points in that piece, here is a summary of what the position entails, augmented by some personal observations and a few thoughts on how the experience was a worthwhile lead-up to my current position as production officer for the RCN's Joint Support Ship (JSS) Project in Vancouver.

DDG-51 Aegis Production Officer (APO) – Position Overview

The USN DDG-51 program manager and program management office (PMO) staff are based in Washington, D.C. There are two yards that build DDG-51s: General

Dynamics – Bath Iron Works in Bath, Maine, and HII in Pascagoula. Each yard has a USN on-site detachment commander referred to as the Program Manager Representative (PMR), who oversees the local administration and execution of the build contract. As the Aegis Production Officer, the RCN ExO reports directly to the DDG-51 PMR, a Commander (USN). The APO is responsible for:

- Supervising day-to-day production activities;
- Coordinating technical inspections;
- Reporting on construction progress for each vessel;
- Liaising directly with the shipyard's construction management team to resolve problems;
- Acting as the primary point of contact for the initial ship's crew;
- Assisting with the planning and execution of sea trials;
- Resolving defects discovered during trials; and
- Coordinating defect repairs as part of the warranty guarantee program.

Consequently, the APO manages a team of approximately 20 USN sailors, public servants and contracted personnel. To state that this is a challenging position with a steep learning curve is an understatement. The RCN ExO must rapidly learn to operate within the USN environment, the local Supervisor of Shipbuilding Command, and the HII shipyard. However, a post-Head-of-Department Marine Systems Engineering (MS Eng) lieutenant-commander with experience working for a Fleet Maintenance Facility, N37, Directorate of Quality Assurance, or a major capital project is sufficiently trained and ready for such a challenge. The RCN ExOs are held in high regard by the USN and shipyard personnel due to the strong leadership, marine engineering knowledge, and general naval officer competencies that we bring to the job.

Unique Observations

Shipbuilding is hard work, complex, and extraordinarily expensive, but it is without a doubt the most significant take-away of my tour. When I arrived in Pascagoula, it was during the early stages of the DDG-51 build program restart following five years of inactivity. Seeing the first post-restart hull delivered to the USN provided me with a rare perspective on what greatly resembled a new-build program.

Before I discuss a few supporting examples, let me first provide some context. Displacing roughly 9,000 tonnes and costing approximately \$1.8 billion per hull, the



Launch of USS Ralph Johnson (DDG-114)

DDG-51 *Arleigh Burke* class is a versatile multi-mission destroyer, designed and outfitted to enable the fulfillment of AAW, ASW and ASuW roles. The first DDG-51 keel laid at HII was in 1990, and for the next 20 years the USN embarked on the longest production run for any USN surface combatant since the end of the Second World War. Throughout the late 1990s and early years of this century, HII was delivering hulls to the USN *every six months*. By 2012, Huntington Ingalls Industries and Bath Iron Works had collectively delivered 62 DDG-51 hulls.

The delivery of the USS *Michael Murphy* (DDG-112) in 2012 was thought to be the final installment, as the class was to be replaced by the futuristic DDG-1000 *Zumwalt* class. However, due to extensive cost and schedule overruns, production of the *Zumwalt*-class was halted and limited to just three hulls. By the time of my posting in the summer of 2014, the DDG-51 production line had been reactivated, with lead ship USS *John Finn* (DDG-113) already 30-percent complete. Despite having built 62 previous ships, the restart encountered several challenges associated with a first-of-class build.

One similarity to a new-build program was that a sizeable contingent of the workforce was new to the DDG-51 program. Although there had been just a five-year cessation of construction activities, it had been long enough that many of the shipyard personnel with DDG experience had retired, moved on to other build programs, or been laid off. This loss of experience was particularly evident in the skilled trade workforce and trade supervisors. While the shipyard itself remained very active by building LPDs, LHAs, and Coast Guard cutters, recovering from the loss of the DDG-51 class-specific build expertise was exceptionally difficult, and introduced delays in the schedule.



DDG-114 keel-laying ceremony

In addition, the pause in construction was long enough that large sectors of the supply chain specific to the DDG-51 had simply dissolved. Reactivating the supply chain proved to be a complicated task, littered with risk, that impacted the timely delivery of critical contractor-furnished equipment (CFE) and government-supplied material (GSM). The cascading effect of late deliveries compounded the schedule delays.

There were also issues with the attainment of “stationization,” a shipbuilding assembly line process where groups of production workers are “on station” to perform the same sequence of work repeatedly. It is what a shipyard must do to build ships cost-efficiently. Without stationization, it is nearly impossible to effectively incorporate lessons learned, improve processes, and achieve repeatable quality. Since shipyards require sufficient work scope in all phases of construction to hire, develop, and employ their workforce in each phase, stationization cannot be achieved without multiple hulls in concurrent construction. From what I observed, the effective implementation of lessons learned resulting from stationization did not gain significant traction until the fourth or fifth hull.

To further illustrate just how complex shipbuilding is, consider this: After building 26 consecutive DDG-51s, the first two hulls after the five-year hiatus took 30-percent longer to build than the average build time during the

previous steady-state production years. The third hull was projected to take even longer as it was routinely robbed of parts and personnel to ensure the first two hulls were delivered to the USN as expediently as possible. Due to the complex nature of shipbuilding, shipyards need build programs with multiple hulls to have a chance at optimizing processes, developing their workforce, growing their supply chain, and driving toward cost-effective ships.

Preparation for Employment with Canadian Major Capital Projects (MCPs)

Within the context of the National Shipbuilding Strategy and employment with a Canadian shipbuilding MCP, this ExO billet provides an unparalleled opportunity to develop a skill set of experiential shipbuilding knowledge for use back in Canada. Working with a mature shipbuilder and the USN provided exposure to numerous aspects of shipbuilding that could be applied to my current role as the JSS Production Officer. For example:

- **Exposure to Shipbuilding Processes** – This experience included developing an appreciation for the contractual technical requirements, relevant standards and specifications, the proper sequencing of construction activities, and the management of government-supplied material and contractor-furnished equipment.

- **Trial Programs** – This aspect of the operation included assisting the shipbuilder and government trial officials in the development of a trials program that aligned with the construction schedule of the ship. It also included considerable exposure to the integration of the pre-commissioning crew training required to support sea trials, custody transfer at delivery, and post-delivery activities.
- **Contracting Principles** – Although I was less directly involved, there was sufficient opportunity to develop an understanding of project costs, scheduling, earned value metrics, risk management, change management, and the contracting frameworks that govern the relationship between the USN and the shipbuilding contractor.
- **On-Site Detachment Level Oversight, Coordination, and PMO Reporting** – As the Aegis Production Officer, one gains unique insight into how shipyards work, what motivates such an organization, and how to interact with shipyard management to cultivate a productive working relationship. Additionally, the APO learns to utilize limited resources to perform roving technical surveillance inspections based on assessed risks, and establish reporting mechanisms between the On-Site Detachment and the PMO.

Having overseen the construction of six DDG-51s in various stages of build — from start fabrication ceremonies through to post-delivery activities — I was able to participate in many of the core phases of naval shipbuilding. Back home in Canada, with three Arctic and Offshore Patrol Vessels in construction, steel being cut under the Joint Support Ship early block build contract to advance delivery of the first JSS, and the Canadian Surface Combatant build program in the project definition phase, the relevance and benefit of this exchange opportunity are clear, especially as a precursor to employment with one of these Canadian shipbuilding major capital projects.



Conclusion

The experience and work ethic of the shipbuilders in Pascagoula made it enlightening to share in their struggles and successes, and see first-hand just how demanding shipbuilding really is, even for a mature shipyard with 80 years in the business. Developing a shipbuilding industry in Canada is a very noble endeavour; the trickle-down economics have the potential to be immensely beneficial to the Canadian economy, and will ultimately generate a strategic asset for the nation. It can only be hoped that we collectively maintain the political and institutional patience, steadfastness, and vision to stay the course.

As the Aegis Production Officer, I was challenged daily, but nothing felt more like success than getting underway for builder's sea trials on the USS *John Finn* (DDG-113). Witnessing the ship successfully execute a main machinery full-power trial after having overseen its construction for two years was truly an emotional and unforgettable experience — one that continues to motivate me today. In addition to the unique professional development aspects of this exchange position, life on the Mississippi Gulf Coast was a superb family experience as we enjoyed the food, music, culture and opportunities of the American South.

There is no time like the present to start planning a career path that aligns with this unique and rewarding “OUTCAN” opportunity. MS Eng naval technical officers who are interested in investigating this further would definitely benefit from reading Capt(N) Catsburg's article. His description of the daily shipyard activity surrounding the Aegis production work at Pascagoula is both informative and compelling.



LCdr Blanchfield is Production Officer for the Joint Support Ship Project at the PMO JSS Detachment in Vancouver. Prior to his ExO posting to Pascagoula, he worked as Quality Assurance Manager for the QA Workcentre in Victoria, BC. While in that position, he was On-Site Manager for HMCS Protecteur's last refit, and led several ISO 9001 quality management system audits of suppliers in support of the Victoria-class In-Service Support Contract (VISSC) and Frigate Life-Extension (FELEX) program.

FEATURE ARTICLE

Approach for a Combined Visual and Passive Acoustic Detection and Classification of Marine Mammals Capability in the Strait of Georgia at Nanoose Bay at CFMETR

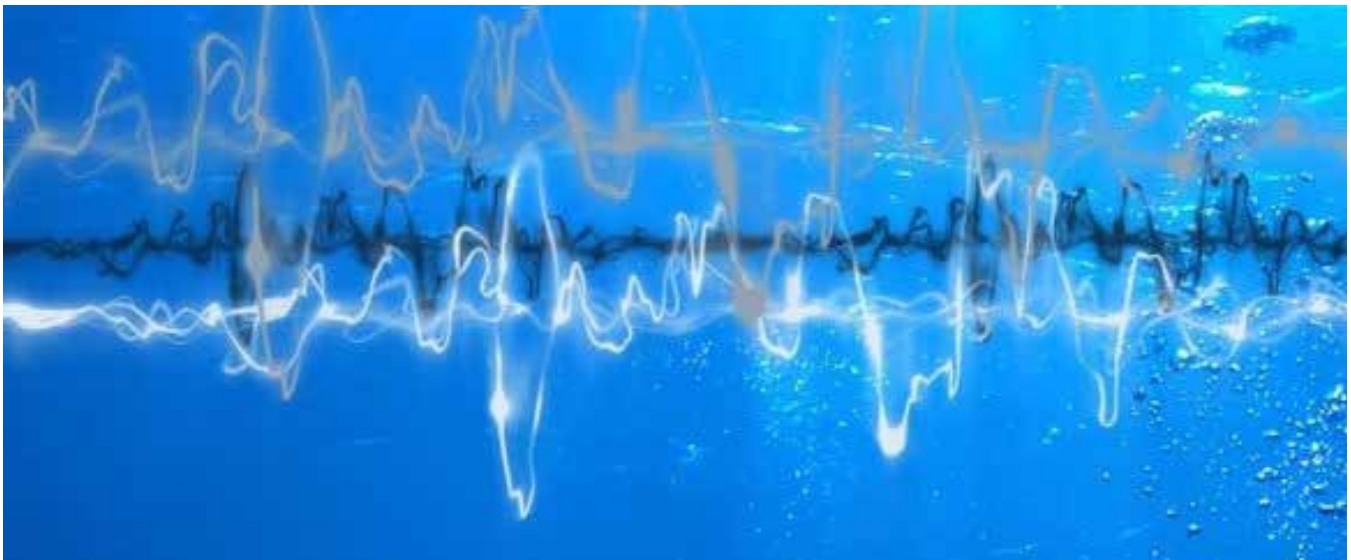
By

Stephen McCormick, Canadian Forces Maritime Experimental and Test Ranges (CFMETR), Nanoose Bay, BC;

David J. Moretti, Naval Undersea Warfare Center (NUWC) Division, Newport, RI;

Dawn Grebner, Naval Undersea Warfare Center (NUWC) Division, Keyport, WA;

Dugald Thompson, Defence Research and Development Canada (Pacific), Victoria, BC.



Federal environmental laws and regulations, as well as Department of National Defence (DND) policy put RCN/RCAF commanders at risk of interrupting or aborting routine anti-submarine warfare (ASW) operations and training opportunities due to a lack of capability in detecting marine mammals. In order to exercise due diligence with respect to our environmental responsibilities, this proposal is aimed toward acquiring such capability on the test ranges at CFMETR. Enhancing our limited detection techniques, and improving species identification will effectively develop a greater ASW capability, and responsibly reduce harm to marine mammals.

Harm to marine mammals, especially at-risk species, is prohibited by Canadian Acts and Regulations and those of our allies. To comply with these directives, CFMETR range staff require the ability to detect, classify and localize mammals so that test directors and range safety officers can make critical decisions. Passive acoustic monitoring (PAM) is a proven method of detecting and classifying

vocally active marine mammals, and when combined with visual monitoring will help ensure DND compliance with harm reduction strategies.

The Need

Current mitigation strategy depends solely upon visual data collection. However, when the sea state rises, especially above Beaufort 3, visual detection becomes nearly impossible. It is widely known that the combined use of visual and acoustic data collection techniques presents the best chance for success in determining the presence of marine mammals (Burham et al, 2016). DND is responsible for compliance with the environmental laws noted above, including the Species at Risk Act (SARA). One example of the need for better monitoring is the current plight of the killer whale populations in BC coastal waters (Ford, 2006). The recovery strategy for the transient killer whale (*Orcinus orca*) in Canada is a commitment of three

federal agencies — Environment Canada, Parks Canada Agency, and Fisheries and Oceans Canada — under the Accord for the Protection of Species at Risk. (Sections 37–46 of SARA). In general, 35 percent or 13/37 of marine mammal species (Gaydos & Pearson, 2011) are at risk in the Salish Sea, which underscores the need for DND to deploy all available means for detection, classification and localization (DCL) of marine mammals.

Long-term Goals

For effective long-term passive acoustic monitoring of the Strait of Georgia region of the Salish Sea in the vicinity of the test range, automated algorithms must provide the ability to detect and classify marine mammal vocalizations and ultimately, in some cases, provide data for estimating the population density of the species present. In recent years, NUWC researchers led by Dave Moretti and colleagues have developed a number of algorithms for detecting calls and classifying them to species or species group, such as beaked whales (Jarvis, et al. 2012). In this project, we are implementing improved methods for detection, classification, and localization of the types of marine mammal sounds we expect to find in the Salish Sea. A follow-on project will require an underwater gateway array capable of detecting the 7-Hz to 180-kHz frequency range of marine mammal vocalizations (Barker & Lepper 2012) to make full use of the PAM system. This system could also collect fast Fourier transform (FFT) based detection archives, and wideband recordings in parallel with visual observations, to document the species present along with their vocalizations. Understanding vocal behaviour is key to monitoring and developing long-term abundance estimates, and provides a means for conducting



Photo courtesy Terry Berkeley

effective monitoring. As outlined by the National Academies report (Tyacke et al, 2017), passive acoustic monitoring of marine mammals may provide the necessary data to inform regulators about changes in population health in a timely manner.

Objective

CFMETR will be deploying advanced real-time passive acoustic marine mammal detection, classification, and localization methods using proven DCL algorithms, and refining standardized interfaces and software. While a number of algorithms and acoustic methods exist, this project will focus on the Marine Mammal Monitoring and Recognition (M3R) on Navy Ranges solution developed at NUWC, and which has been successfully demonstrated to be effective on other ranges. The M3R system would be used concurrently with current visual observation protocols.

Approach

The M3R on Navy Ranges program has developed a system to allow real-time, continuous and automated detection, classification, localization and monitoring of marine mammals in-situ on the U.S. Navy's undersea test and training ranges. The detection, classification and localization (DCL) algorithms fall into echolocation click classification, tonal signal detection, and multi-sensor localization. The M3R program on USN underwater ranges also carries out research on marine mammal distribution and habitat use, density estimation, vocal behaviour, and the effect of sound on marine mammals.

To date, the M3R system has been installed on three U.S. Navy undersea ranges: the Atlantic Undersea Test and Evaluation Center (AUTEC) located off Andros Island in the Bahamas; the Southern California Offshore Range complex (SCORE) off San Clemente Island in Southern California; and the Pacific Missile Range Facility (PMRF)

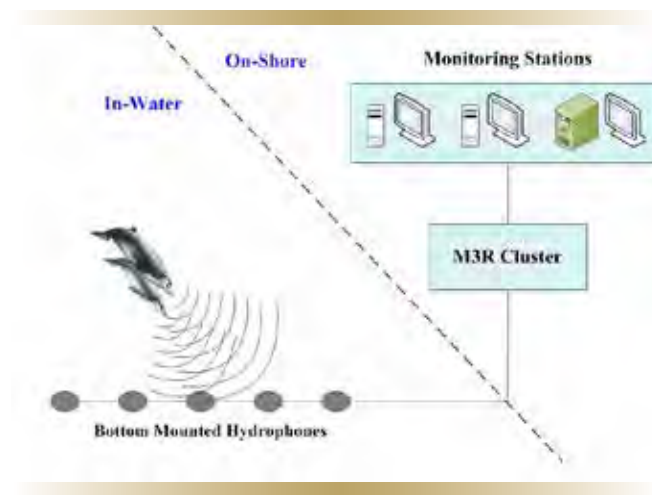


Figure 1: M3R Basic System

Photo courtesy Terry Berkeley



located off Kauai, Hawaii. Marine mammal vocalizations of sufficient strength that fall within the bandwidth of the hydrophones are detected, processed with localization and classification algorithms, and sent to real-time monitoring displays. The intent is to replicate this capability at CFMETR in Nanoose.

Assessing the size of marine mammal populations has traditionally relied on visual surveys alone, but the addition of passive acoustic monitoring can complement these surveys if reliable algorithms can be implemented and calibrated against visual techniques. Several fundamental issues must be resolved before acoustic monitoring can be reliably applied to marine mammal assessment. In the case of CFMETR, we are limited to aging hydrophone arrays that happen to be clipped below 10 KHz. CFMETR is exploring options to enhance our detection capability until NUWC makes necessary upgrades to the range arrays. Additional detection capability will likely add some additional costs above the initial \$75K investment. The other issue is modifying the algorithms to correlate to the species of marine mammals that inhabit the Strait of Georgia. It is intended to conduct acoustic and visual surveys of marine mammals in test range area “WG” to address the following questions:

1. What acoustic signals are produced seasonally by marine mammals in this region?
2. Can these signals be reliably and accurately associated with particular marine mammal species?
3. Can these signals be detected and classified well enough to allow tracking? Or, conversely, what density of acoustic sensors is required to effectively monitor these animals?

4. How often do individual marine mammals vocalize, and how variable is their vocalization behaviour?
5. Can the number of animals in a given region be estimated from acoustic data? Can acoustic estimates improve the density estimates derived strictly from visual surveys?
6. What behavioural information might be obtained from acoustic and visual monitoring?
7. Is it possible to relate animal activity to an event, such as a range test event? The long-term goal is the analysis of what happens to animals following range activity.
8. Can acoustic monitoring be used to mitigate a potentially harmful event?
9. How can this information be used to help shape DND policy on marine mammal mitigation?
10. How can this information be used to structure CFMETR range events/scheduling to minimize impact on marine mammals?

Work Completed

Meetings, project, and funding:

(1) David Moretti demonstrated the SCORE M3R system to the CFMETR Range Engineer and Dr. Dawn Grebner, NUWC Keyport Bioacoustician in San Diego 29-31 May 2018.

(2) Dawn Grebner and Steve McCormick have begun working on a framework for the implementation of the M3R system at Nanoose. Dawn has collaborated with other biologists and researchers in NUWC.

(3) A minor capital expenditure project has been sponsored and funded by the Director General Maritime Equipment Program Management (DGMEPM) for the initial acquisition of the M3R hardware.

(4) Kim Houston, Institute of Ocean Sciences (IOS), Major Dugald Thompson, DRDC and Steve McCormick, CFMETR met (22 June 2018) at IOS to discuss the potential of the follow-on Range Gateway array project.

(5) Maj. Dugald Thompson (DRDC) and Steve McCormick (CFMETR) have met and collaborated on options for overcoming the frequency range gap and overall lack of hydrophones that make localization efforts challenging.

(Cont'd next page)

Expected Results

Once M3R is installed at the CFMETR Range Operations Centre, it is expected that acoustic detections can be gathered, and that post-processing of signals can start to reveal the presence of marine mammals. The program will also require modifications to the existing algorithms to classify the species we expect to see in the WG operating area.

Impact/Applications

For the Royal Canadian Navy, PAM will provide a means of long-term monitoring of many marine populations, especially over areas of high interest. Currently, required environmental monitoring is dependent primarily on visual surveys that are costly and, in the case of aerial surveys, significantly dangerous. It is not unreasonable to expect that DND should use all means necessary to conduct marine mammal mitigation detection, including passive acoustic methods. The advanced DCL algorithms being deployed here in the M3R system will make marine mammal mitigation more effective and efficient. The implementation of algorithms across the standardized interfaces that handle both real-time and pre-recorded data streams from diverse platforms will make these data available to the range operators, as well as the wider marine mammal research community.



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Submissions to the *Journal*

The *Journal* welcomes **unclassified submissions** in English or French. To avoid duplication of effort and ensure suitability of subject matter, contributors are asked to first contact the production editor. Contact information may be found on page 1. Letters are always welcome, but only signed correspondence will be considered for publication.

BOOK REVIEW

Allied Coastal Forces of World War II: Vol. 1 — Fairmile Designs and US Submarine Chasers

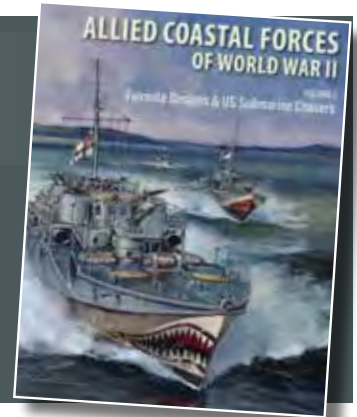
Reviewed by Tom Douglas — Associate Editor *Maritime Engineering Journal*

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ISBN 978-1-5267-4451-7 (Kindle)

264 pages: 150 black & white photos; bibliography; index.



Seaforth Publishing continues to provide a treasure chest of information for the serious student of naval history. Just as they produced a detailed anthology of the builders' plans for Battleship WARSPITE (see review in MEJ 87, Summer 2018), the English-based military book producer now offers this coffee-table publication with schematic drawings of some of the lesser-known craft of the 1939-1945 world conflict.

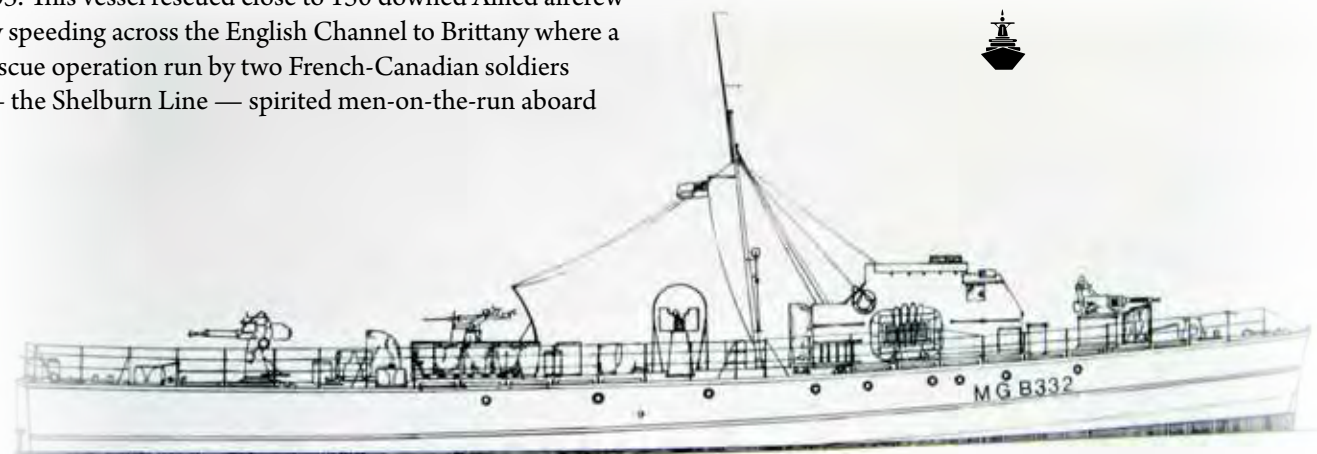
As Seaforth points out, the major contribution made by Coastal Forces to the Allied effort has had little coverage in the literature of the Second World War. Motor torpedo boats, PT boats, motor gunboats, launches and submarine chasers served with distinction in every theatre throughout the war as patrol boats, convoy escorts, minelayers and minesweepers, harbour defence vessels, light landing craft, RAF rescue boats, and transports for agents and clandestine missions.

As the author of half a dozen books on Canada's military heritage, I wrote extensively in a book called *Canadian Spies* about the heroic exploits of the Royal Navy's MGB-503. This vessel rescued close to 150 downed Allied aircrew by speeding across the English Channel to Brittany where a rescue operation run by two French-Canadian soldiers — the Shelburn Line — spirited men-on-the-run aboard

the 32-knot motor gunboat for a quick and safe return to England. Tragically, MGB-503 survived all the derring-do only to hit a floating mine in the English Channel in May 1945 with the loss of all 36 crew members.

This second edition of *Allied Coastal Forces* — the first was published in 1990 — is recognized as a classic work, and the only publication to deal comprehensively with the technical detail of these boats in words, photographs and drawings. Design, construction, and subsequent development are all covered, and the builders, construction lists, fates, and technical data are given for each type. Separate sections cover armament and equipment, seagoing qualities and habitability.

Authors John Lambert and Al Ross II have done exhaustive research on the various craft outlined in this book. The details and intriguing illustrations might well whet the reader's appetite for a second, recently-published volume covering British Vosper motor torpedo boats and the American Elco MTBs, including PT-109 that was skippered by LTJG (USN) John F. Kennedy.



NEWS BRIEFS

Testing of the 100th MWM Engine in the NETE Diesel Test Cell

By Augusto Resera, Eng., PMP

Technical Director, Marine Systems (Montréal)

Naval Engineering Test Establishment (NETE)

The Naval Engineering Test Establishment in Montréal, Québec celebrated an important milestone for its diesel test cell in November 2018 with the successful testing of its 100th overhauled MWM diesel engine for the Royal Canadian Navy's *Halifax*-class frigates.

The NETE diesel test cell was first commissioned in June 1998, and tested its first overhauled MWM engine the following September. Testing includes a run-in program, a performance test at various loads and up to 10 percent overload, followed by a preservation run for the engine's primary cooling water and fuel systems.

Testing overhauled engines in a diesel test cell prior to installing them on board ship provides several benefits, including identifying and repairing defects or leaks, and fine-tuning engine components and operational settings before the engine leaves the test facility. Establishing an engine operating performance baseline in the controlled environment of a diesel test cell is extremely useful for later comparison with shipboard operating performance data.

The NETE diesel test cell also functions as a land-based facility for testing and trialing various engine modifications to ensure their suitability for shipboard implementation. For example, the third-generation low-load injector nozzles, the one-circuit cooling-water system electronic thermostat, the cylinder liner anti-polishing rings, and the single-helix fuel injection pumps were tested on MWM engines at NETE prior to their shipboard trial.

In 2015, the NETE diesel test cell's capability was successfully extended to include testing of the Wartsila UD-23 diesel engine currently fitted on the *Kingston*-class maritime coastal defence vessels. Six UD-23 engines have been tested at NETE to date.

At present, NETE has initiated test cell configuration work to also accommodate testing of the PAXMAN Valenta diesel engine installed in the *Victoria*-class submarines. Set-to-work of the test cell is planned for late 2019.



Completion of the 100th overhauled MWM engine testing in NETE's diesel test cell.

(Left to Right): Carl Chamberland (Task Leader, NETE Marine Systems), Nabil Shehata (Task Leader, NETE Marine Systems – retired), Rick Corbett (Field Service Representative, Wartsila Canada), Pascale Ouimette (Test Engineer, NETE Marine Systems), Bruce Blodgett (DNPS 3-4-3), Cdr Erik Tremblay (NETE Commanding Officer), and Augusto Resera (Technical Director, NETE Marine Systems).



NETE Task Leader Carl Chamberland prepares to verify the installation of a PAXMAN engine on an engine cradle in the test cell.

NEWS BRIEFS

Mari-Tech 2019: Canada's Marine Technical Conference

By Jeffrey J. Smith

The 2019 edition of Mari-Tech, Canada's conference and exhibition on marine technology and shipbuilding, was held in Ottawa April 23-25. The event was a sold-out success, with more than 600 people attending, 71 exhibition booths and 35 technical paper presentations, speakers and panel discussions.

This year's theme — *Firing on all Cylinders* — reflected an increasingly sophisticated and commercial maturity of our country's industry. A large Royal Canadian Navy (RCN) presence, ably led by LCdr Ben Thomson, Acting Submarine Platform Systems Manager in MEPM SM 4, made a substantial contribution to the event.

As in previous years, Mari-Tech hosted the federal government's marine industry consultative sessions, the PSPC procurement "Outlook". This is an opportunity for marine industry suppliers to meet with responsible program managers in ship and vessel operating departments: The Canadian Coast Guard (CCG), RCMP, RCN and others.

Naval engineers now serving in government and industry were featured in several Mari-Tech sessions, including DGMEPM's Dave Monahan; Heather McDonald and Andy Smith from the CCG; Rob Gair of MAN Energy Canada; Mark Soper of Fleetway; Dan Riis of BC Ferries; and McGill University's JJ Smith.

Mari-Tech also saw the award of the Canadian Institute of Marine Engineering's Medal of Excellence. The medal honours exceptional contributions to marine engineering in Canada, including technical innovation, sea-going service, leadership in the industry and the teaching of marine engineering. This year's recipient is Cdr (Ret'd) Darryl J. Hansen, a former RCN engineer who has had an impressive career that includes overseeing construction of the *Halifax*-class frigates, and becoming the first chief executive officer of Deas Pacific Marine Inc., the subsidiary company for maintenance of the BC Ferries fleet.

The Canadian Naval Technical History Association (CNTHA) rounded out the RCN's presence at Mari-Tech 2019 with an information table and knowledgeable volunteers offering the story of what's made our navy a leader in innovation.



Lead sponsor Babcock Canada's Martin MacCordquodale with RCN coordinator LCdr Ben Thomson.

Mari-Tech 2019 was co-hosted by the Ottawa Branch of the Canadian Institute of Marine Engineering and the Eastern Canadian Section of the Society of Naval Architects and Marine Engineers. Mari-Tech 2020 will be held in Halifax next April 28-30.



Jeffrey J. Smith is Chair of the Ottawa branch of the Canadian Institute of Marine Engineering, Canada's professional organization for marine science and technology, and marine engineers. He served as a marine systems engineering officer in the RCN from 1983 to 1993.

A promotional banner for the Mari-Tech 2020 conference. The top section has a dark blue background with the text "MARI-TECH CONFERENCE & EXHIBITION" and "VISION, INNOVATION AND TRENDING IN THE MARINE SECTOR". Below this is a large orange box with the text "SAVE THE DATE! HALIFAX | APRIL 28-30, 2020". The bottom section features the CIMarE logo and a list of activities: "Technical Sessions", "400+ participants", "Exhibitors", and "Networking events". The website "mari-techconference.ca" is listed in the bottom right corner.

NEWS BRIEFS

Naval Architecture Conference a Success!



Photos by Brian McCullough

DGMEPM's James Huang presenting on rubber hub cast manufacturing.

The RCN holds a three-day internal Naval Architecture Conference/Technical Meeting each year to discuss fleet challenges, lessons learned, and ongoing research in the field. The 2019 conference held at the end of February in Gatineau, Québec was broken into three sessions: Material Assurance for an Aging Fleet; Learning from Common Challenges in the Federal Fleets; and Research and Development in Naval Architecture.



RCN naval architect LCdr Brandi Blum, with naval architecture professor Catriona Savage from University College London. LCdr Blum is currently on exchange with the Submarine Naval Authority Group in the UK Ministry of Defence.

We opened our forum up this year to include a number of partners who work closely with us in maintaining our current fleet and in conducting research to improve future capability. The conference attracted more than 50 participants from Maritime Equipment Program Management, Major Project Delivery (Sea), Fleet Maintenance Facilities, Fleet Technical Authorities, Classification Societies, Naval Engineering Test Establishment, Quality Engineering Test Establishment, National Research Council, and the Canadian Coast Guard, along with members of academia. — Lt(N) Shane Kavanagh, Stability and Hydrodynamics (DNPS 2-3-6).



NEWS BRIEFS

Thank you to Canada's D-Day and Battle of Normandy Veterans!

Royal Canadian Navy veterans Fred Turnbull (94) and Charlie Starks (97), and Winnipeg Rifles veteran George Couture (95), were accompanied by family as they participated in 75th anniversary of D-Day and Battle of Normandy commemorations in Halifax in June. Behind them is HMCS *Sackville*, the only one of 269 Allied corvettes from the Second World War that remains, and which continues to serve as Canada's Naval Memorial and a National Historic Site.



Photo by William Gard



Naval Large Tug Procurement

On April 29, the Government of Canada announced the award of a \$102 million (including taxes) contract to Ocean Industries Inc. of Isle-aux-Coudres, Quebec for the delivery of four naval large tugs to replace the Royal Canadian Navy's five civilian-crewed Glen-class large tugs and two Fire-class rescue boats. The first two tugs are scheduled to be delivered to the East and West Coast naval dockyards in 2021, with the last two following in 2023.



Photo by Brian McCullough



HMCS Windsor Transitional Docking Work Period

The *Victoria*-class submarine HMCS *Windsor* (SSK-877) is undergoing a transitional docking work period in Halifax for maintenance and capability upgrades following a successful deployment to the Mediterranean last year, and is expected to return to service later this year.

Pictured here are Lt(N) Kevin Hunt (CSEO), LCdr William Matheson (CO), Capt(N) J.S. (Steph) Ouellet (Commander Canadian Submarine Force), Cmdre Christopher Earl (DGMEPM) and CPO1 Gerald Dautre (DGMEPM Unit Chief) inside the submarine shed in Halifax Dockyard. Inset: Cmdre Earl with *Windsor*'s Marine Systems Engineering Officer Lt(N) Andrew Cho.



Photos courtesy CPO1 Gerald Dautre



The Maritime Engineering Journal is always pleased to share your good news stories. Send us your short write-ups and high-resolution photos as separate email file attachments addressed to: MEJ.Submissions@gmail.com

AWARDS

L-3 MAPPS – Saunders Memorial Award

NTO Award photos by Lt(N) Bertrand Lambert



SLt Thomas Song

Top student, Marine Systems Engineering
Applications Course
(With Ranges Kasturi)

Weir Canada Award



Lt(N) James Melville

Top Marine Systems Engineering Phase VI candidate
(With Joel Parent)

HMCS Sackville Award

Photo by Brian McCullough



PO2 Craig Smith was presented the 2019 HMCS Sackville Award by sponsor Capt(N) David Benoit at the annual MARLANT Naval Technical Seminar at CFB Halifax in May. The award is presented annually to one of the top four Weapons Engineering Technician (W Eng) Maintenance Manager Course graduates after competing in a mini-board for the honours. PO2 Smith is currently attach-posted to Naval Fleet School (Atlantic) as manager of the Personnel Awaiting Training cell. Bravo Zulu Craig!

— **PO1 Charles Bressette, Weapons Engineering Manager, Naval Fleet School Atlantic.**

Royal Military College of Canada Carruthers NT Sword



Photo by Jennifer Jordan

NCdt Hyun-Jae Choi

For academic achievement and exemplary performance
(With Capt(N) Jim Carruthers, RCN (Ret'd))





NEWS

Canadian Naval Technical History Association

CNTHA News
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Views expressed are those of the writers and do not necessarily reflect official DND opinion or policy. The editor reserves the right to edit or reject any editorial material.

www.cntha.ca

The records we keep

By Pat Barnhouse

When Vice-Admiral Bob Stephens and Rear-Admiral Bill Christie died one day apart in April, they each left behind personalized accounts of their interesting and impressive careers. The CNTHA was fortunate in being able to interview both gentlemen, and to also receive a written submission from Bob. The resulting documents can be found on the CNTHA website.

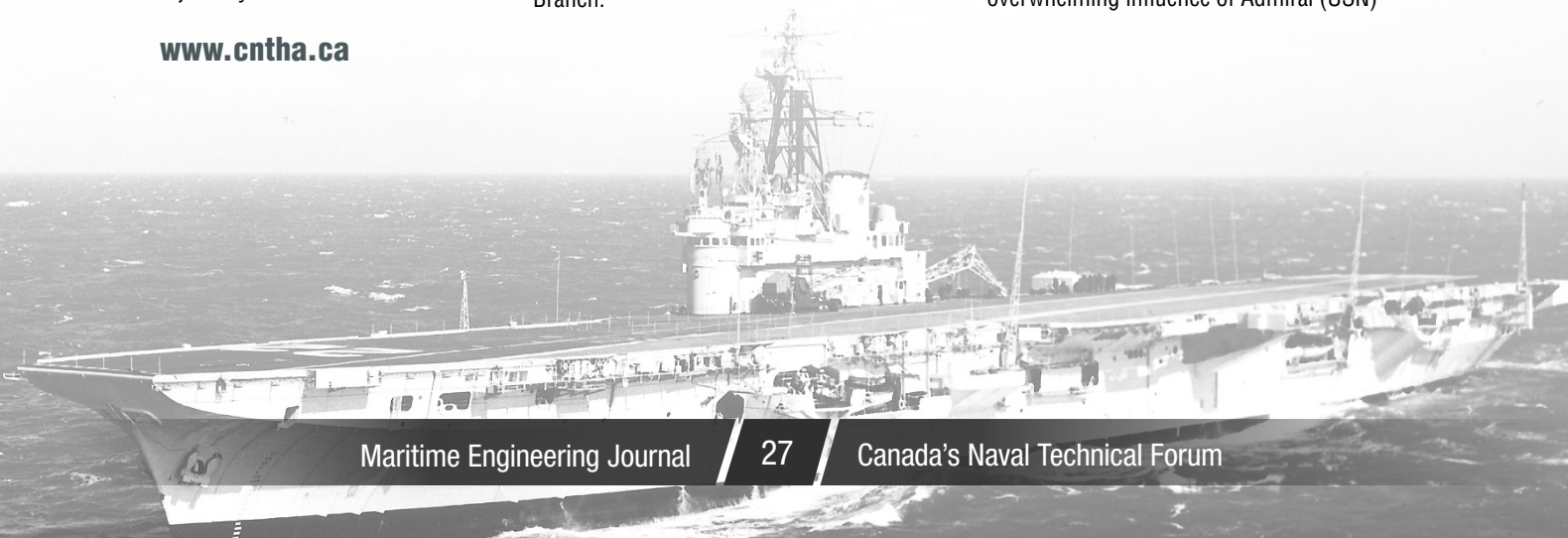
When RAdm Christie was interviewed in October 2006, the discussion covered a wide range of major naval projects over a considerable period of time, and mainly from a senior officer's perspective. Bill spoke about his experiences during the early days of Naval Headquarters' concept development work on the DDH-280 destroyers, overseeing the *Oberon*-class submarine build and outfit at Chatham Dockyard, and fitting-out the aircraft carrier HMCS *Bonaventure* in Belfast.

Bill Christie also discussed a specific aspect of the armed forces unification of the mid-1960s — that being the Pennyfather Committee that studied the reorganization of National Defence Headquarters in Ottawa. The committee also delved into the manner in which the Navy managed major procurement projects, resulting in a complete change in the way of doing business. A final aspect of the interview covered Bill's secondment to the Department of Supply and Services as head of the Shipbuilding Branch.



RAdm Christie (right) being interviewed by Gord Smith in 2006.

VAdm Stephens' written submission from January 2006 was in response to questions submitted to him by the CNTHA. It covers, first, his views on the success/failure of various Canadian shipbuilding programs, in which he observes that in general while they were "fraught with difficulties," they were successful in the end. In addition, he commented at length about the relationships between DND and the Department of Defence Production, and on the relations between industry and DND. He also offered considerable insight into Canada's first attempt to initiate a nuclear submarine program, including his take on the overwhelming influence of Admiral (USN)





VAdm Bob Stephens (centre) shared aspects of his career with members of the CNTHA in 2008.

Hyman G. Rickover. He closed by discussing the role of his father, Engineer Rear Admiral George Leslie Stephens, as head of the Special Advisory Committee to the Minister of National Defence on the role of naval dockyards, a task that involved both high-level government and industry personages.

Bob Stephens' interview in April 2008 covered some of the same ground as his written note, but generally from a different perspective. He touched on his experiences as a junior officer, about bringing industry up to speed on the boiler requirements for the *St. Laurent*-class destroyer escorts, and

on the important roles of the Naval Engineering Design Investigation Team (NEDIT), the Naval Engineering Test Establishment (NETE), and the Naval Central Drawing Office (NCDO), and the pivotal role of Constructor-in-Chief Cmdre Rowland Baker, the naval architect on loan from the RN. Bob also spoke about his involvement with nuclear engineering at the British nuclear research establishment, Harwell, and with the Nuclear Submarine Survey Team. Of interest is his time as Manager Ship Repair in the Halifax Dockyard, and the initiation of a much-needed update and modernization. The interview closed with some observations on the introduction of gas-turbine propulsion.



Canada