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Looking Back: The Multi-Ship Refit Program for Steam Destroyers

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Maintaining an aging surface fleet is hardly a new experience for a cost-conscious RCN. From the mid-1970s until the mid-80s, the Navy embarked on an innovative multi-ship refit program aimed at reducing costs, and improving refit management for Canada's East Coast destroyer escorts to see them through to the 1990s.

Was it successful? In 1980, after 11 refits under the new scheme, naval engineers from No. 2 Canadian Forces Technical Services Agency in Montréal conducted a comprehensive review of the program, documented in an 8,000-word report co-authored by **Capt(N) D.H. Benn, LCdr R.J. Houle**, and myself. Looking back, the report offers unique insight into what became a key stepping stone in the development of today's in-service support contracts for refitting naval vessels.

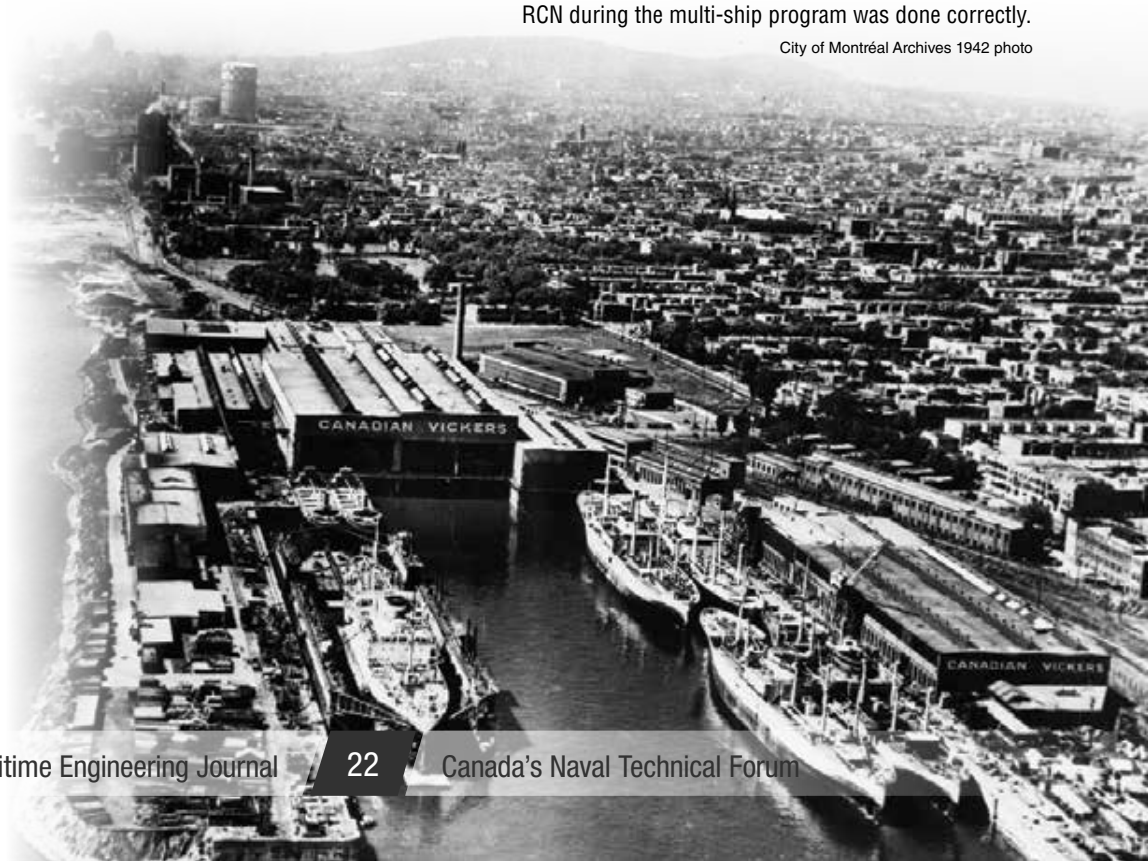
The Multi-ship Approach

For some years, it had been government policy to conduct individual refits at commercial shipyards for the Navy's fleet of steam-driven destroyers commissioned in the 1950s and '60s. By adopting a radically new multi-ship approach, whereby ships of the Atlantic fleet would be refitted sequentially by a single yard (Canadian Vickers Ltd., Montréal), it was envisaged that economies of scale would result in greater efficiencies and cost savings by allowing the contractor to assemble, develop and maintain a well-trained work force current in naval technology, supported by a network of subcontractors with recent experience in naval repairs. With the assurances offered by a long-term contract, Vickers would have the stability to develop improvements in planning and standardization of procedures for overhauling complex naval systems, which should in turn improve performance with respect to delivery.

Along with this, the Navy introduced its so-called 'zero-manned' refit concept, which no longer required ships' crews to separate from their families to support a refit by providing onboard security, carrying out a

Capitalizing on the lessons learned by each successive refit, and supported by a skilled work force that could look forward to steady work, the Vickers shipyard in Montréal made considerable progress in ensuring that all refit work done for the RCN during the multi-ship program was done correctly.

City of Montréal Archives 1942 photo



Royal Canadian Navy photo

HMC ships *Ottawa* (DDH-229) and *Fraser* (DDH-233) in the Halifax Naval Dockyard, circa 1967. The RCN would soon adopt a radically innovative multi-ship refit program, whereby ships of the Atlantic fleet would be refitted sequentially by a single yard, i.e. Canadian Vickers Ltd., Montréal.

portion of the technical repair work, and conducting set-to-work. Under the new system, ship's staff would turn their ship over to the contractor, who was now responsible for safety and security, and then return home to Halifax until the trials phase was set to begin at the end of the refit. Overseeing the refit work and quality assurance (QA) would be the responsibility of the Canadian Forces Technical Services Detachment (TSD).

To help ensure that no work was overlooked due to the absence of ship's staff, special attention was directed at improving pre-refit surveys to identify and incorporate known defects and deficiencies into a Particularized Specification List (PSL) for each individual destroyer. The PSL would augment the items already listed in the Standard Ship Repair Work Catalogue (SSRWC) that was normally published six to seven months ahead of a refit as part of the Request for Proposals package. Generally, the PSL/SSRWC system was a great improvement over the previous single-ship Maintenance and Repair Specification List (MRSL), although the lag between the pre-refit survey and the actual commencement of the refit could be substantial. This meant that the ship's condition on arrival in the contractor's yard was usually considerably worse than what was depicted in the PSL, necessitating additional surveys by the TSD, and negotiation of costly arisings of unforeseen work.

By their very nature, arisings that revealed themselves once equipment had been opened and examined could not be negotiated from a position of strength. DND was often faced with a "take it at this price or leave it" option, which caused numerous technical, scheduling, logistics, and financial problems. While arisings were less common than with typical single-ship refits, some hurdles still existed, particularly when equipment needed repair that was not identified in the MRSL. The solution was vested in the TSD, which often referred the issue to the DND life-cycle material manager (LCMM), or the Naval Engineering Unit in Halifax.

Finally, to ensure quality control over the significant amount of repair and overhaul (R&O) work, the Naval Engineering Test Establishment (NETE) in Montréal supported the Vickers refits by conducting comprehensive vibration analysis and pre-installation testing of all overhauled machinery and electronics.

Supply Support

Responsibility for the logistics support of multi-ship refits rested, ultimately, with NDHQ's Directorate of Procurement and Supply Maritime. Generally, supply support was well administered. Government Supplied Material stores for individual ships were marshalled at the Canadian Forces Supply Depot (25 CFSD) in Montréal 90 days prior to the commencement of a refit, and transferred to the Vickers yard, and to their charge, 30 days prior to the start date. These processes ran smoothly, but we did identify several weaknesses in overall logistics support on the part of both DND and the contractor:

- DND deficiencies related to improper identification and poor packaging of materials; issuing shelf-expired stores; abusing the demand system by using a higher priority than was required; and classifying demands on the Supply System for completion of work arisings as "one offs," when data indicated that many requirements were repetitious, and should have been classified as "recurring."

- Contractor deficiencies included lack of sufficient staff and commitment to assume the initiative in procuring the materials needed to meet work arisings—Vickers had a tendency to shift this task to the Crown on the premise that materials were not available commercially, thus placing the onus for expediting, and the consequences of late delivery, on the Crown; and placed heavy reliance on our TSD supply technicians to ensure compliance with the material handling aspects of the contract.

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Royal Canadian Navy photo

HMCS *Fraser* (DDH-233) with *Margaree* (DDH-230) in the background. Both ships were part of the destroyer multi-ship refit program at Canadian Vickers Ltd.

Quality Control/Assurance

The multi-ship contracts included a Contractor's Quality System Requirement, which in essence spelled out the contractor's inspection procedures for ensuring that the quality aspects of the refit were being maintained. This requirement was not as all-pervasive as the DND standards, but nevertheless demanded a commitment to a quality control program, and assurances that the work was being performed under controlled conditions, and being inspected for compliance by an internal organ of the company that was not subservient to production.

While Vickers never quite fully achieved this as we had envisioned, considerable progress was made over the course of the contracts to ensure that all the work was done, and done correctly. This was due in no small measure to the competence of the contractor in capitalizing on the lessons learned by each successive refit, and supported by a skilled work force that could look forward to steady work.

Despite various shortcomings and frustrations, few if any delays in deliveries were ever attributable to contractor performance, and, if warranty claims served as any measure of success, the paucity of post-refit claims spoke well of the program. The contractor's reliance on TSD personnel for technical and QA knowledge, and to close the gaps in supervisory staff was problematic, but there was an underlying spirit of respect and mutual co-operation between the TSD and Vickers to get the job done.

Observations

Midway through the 10-year program, we were pleased to report that many aspects of the multi-ship refit program were running relatively trouble-free. We were fortunate that despite some early schedule slippages the multi-ship refits were completed essentially on time, but we questioned why bonuses for timely completion were never considered feasible, especially considering the contractor really didn't have much to lose by late completion.

It was in the area of traditional refit work where we determined improvements had to be made if we were to progress to the next degree of efficiency in ship refits. In the opinion of the overseers, some means still had to be found to reduce the volume of arisings, which were costly, disruptive, and inspection-intensive. Furthermore, we found that a disproportionate effort was required to process routine production-line repairs due to inadequate contractual arrangements that placed the onus on the Crown rather than the contractor.

We also noted that some aspects of the refits could have been better automated. Considering the commitment at the time to extend the lives of the steam destroyers to the 1990s, there was a strong argument for getting in step with the Forces-wide repair & overhaul philosophy. Doing so would have introduced greater repair-by-replacement (RxR) into ship refits, thereby reducing the volume of non-competitive arisings. The repair of valves was a classic example of how this could have saved us time and money. Whereas the contractor was told to "remove, open, examine, close, test, and reinstall" valves, could they not have been told to overhaul them as well? Our experience was that it would have been more efficient to specify full overhaul in the contract, rather than have to deal with costly arisings.

Image courtesy Coll. AHMHM, Fonds M. Boswell, AHMHM_F0017_MBOSWELL_D0001_PHOTOS_0001

An undated aerial view of the Canadian Vickers Ltd. Shipyard, Montréal.

Conclusion

The multi-ship program for the RCN's East Coast fleet of steam destroyers achieved the majority of its aims. Relinquishing entire responsibility for safety and security to the contractor, and handing off responsibility for oversight and quality assurance to the TSD proved successful. But even though it appeared to be the right solution at the right time for the kinds of problems we were experiencing with a fleet of aging ships, we could already see where the needle was pointing in terms of increasing the cost-effectiveness and general efficiency of the refit process.

In our closing remarks, which now seem both prescient and amusing in hindsight, my co-authors and I noted that "The day must certainly be approaching when we as the customers will be able to adopt a completely hands-off approach to ship refits...To those who look upon such a suggestion with incredulity, let us remind ourselves of our reaction, not so many years ago, to the proposition that ships' staffs leave their ship in someone else's custody, and pick it up when it's ready. Such a routine is now second nature. What will we be taking for granted in 1990?"

What indeed?

Capt(N) (Ret'd) Roger Chiasson served 38 years as a marine systems engineer in the Canadian Armed Forces until his retirement in 1998. During a career heavily slanted toward ship repair and construction, he was overseer for the DDH-280 construction project, and Commanding Officer of Ship Repair Unit Atlantic during the two weeks in August 1990 when three Canadian warships were readied in record time for deployment to the Persian Gulf under Operation Friction.