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INTRODUCTION

Canadian Navy personnel, both active and retired, formed a group to collect various historical details of the technical content of the Canadian Navy under the banner of Canadian Naval Technical History Association (CNTHA). During its initial deliberations it was defined that Canadian Industry had a major role in the areas of design, build, outfit, equipment, etc, and a sub-committee was organized in 2002 named Canadian Navy Defence Industrial Base (CANDIB) to research these aspects of purely indigenous Industry contribution. The Navy had previously bought and operated warships of foreign design and, in most cases, then modifying those warships to better withstand the Canadian operating environment.

This publication is the basis of the resulting Section of the CANDIB Report dealing with the indigenous Warship Design capability. **Many people contributed data to this publication, and my thanks are extended gratefully herewith for that cooperation – they are listed in the appropriate sections herein. Whereever possible, I scanned the original documents into my computer and reproduced them *in toto* to eliminate any prospect of incorrectly stating their facts. Any additional interpretation of these data that may be in error are solely the responsibility of the author. Similarly, references to published documents (numbered in parentheses) used in this publication are listed and included in a Chapter at the end of this publication.**

The latest new large warship design in Canada – the Halifax FFH 330 Class Frigate (1983)

SUMMARY

The CANDIB study of the ***Defence Industrial Base,*** which served the Canadian Navy from the beginning of World War II to the present time (2002), has been primarily in the ***Design, Build, Outfitting and Maintenance of its warships.*** During that 57 years period the progressive reduction of the need for such a large Navy resulted in a concomitant reduction of warships and resulting Navy manpower. In parallel, the ever smaller defence budgeting by the Federal Government over time required the Navy to reassess both its warship and its manpower requirements to the point where its uniformed manpower needed to be directed more and more towards its ship-borne operational requirements and away from its on-shore support activities. This allowed Industry the opportunity to do some of the Navy's on-shore logistics management functions. In the years closing out the 20th century the ***on-shore Logistics and Operational Support*** activity was consequently also part of Industry's ***Defence Industrial Base***.

Historically, prior to 1945 the Navy had bought its larger ships offshore and in some instances built its smaller vessels in Canada but to foreign designs. It also bought existing commercial vessels and converted them to the Navy's required use. At that time Canadian Industry did not have the capability to design and build the larger, more complex warships. However, ***World War II*** saw both Canada's Navy ***operating*** larger warships provided primarily by the UK Royal Navy, and Canadian Shipyards being required to ***build*** large quantities of smaller ships, thus driving Canadian Industry to expand its ***shipbuilding*** capability. ***Immediately post war,*** the Navy decided to also build up its own ***design*** capability. An expanded infrastructure was therefore required. Canada had a well-defined commitment in its post World War II membership in NATO, viz. an anti-submarine responsibility in the North Atlantic. The shipyards were available - the design element of this infrastructure was missing.

The Navy chose to encourage the setting up of a design capability by Canadian Industry, and in such a manner as to allow the Navy to oversee the work and consequently to grow its own expertise in parallel with the Industry capability. This led to a specific form of **Directed Contract,** euphemistically named NCDO (Naval Central Drawing Office).

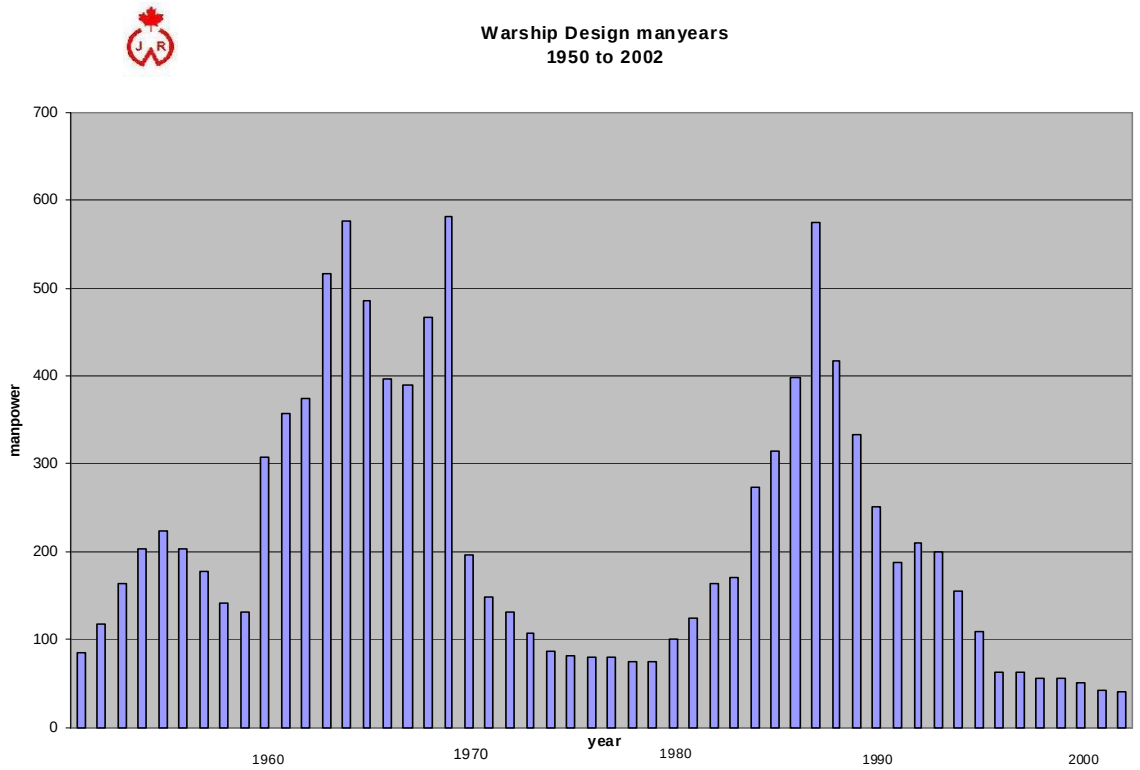
This publication deals first with the history of that Design capability in a narrow focussed manner, from which later emerged a broader Industry design capability, and the progression of the Government's contracting practise for ship design and maintenance from **Directed Contract** to a broader base **Competitive Contract**.

This publication shows that in 1949 the Navy encouraged Industry to build that major warship design capability, only to see it dispersed in 2002 through (a) lack of sustainable business from the Navy, and (b) in the Navy not continuing its in-service ship support with that original NCDO company that had accumulated that experience of the previous 52 years.

The Navy developed its own Dockyards located at Esquimalt, BC and at Halifax, Nova Scotia for its day-to-day requirements for physically maintaining the ships in up-to-date fighting configuration. The Navy also developed and retained its own on-shore Research & Development capability manifested in the Department of National Defence (DND) Defence Research Establishments that were primarily staffed by civilian employees of DND. The Navy also developed and retained its own Engineering cadres within DND, also staffed by civilian as well as uniformed personnel.

A realistic summary of this warship design capability is offered as the accompanying graph, completed with the appropriate man-year content of all warship design activity made by Canadian Industry on behalf of the Canadian Navy in this time period. This includes new ship designs and existing ships' conversion designs. It does not include the Production Engineering work, which is a function of the Engineering Department of the individual shipyard to convert the Design Drawing package that was normally produced in accordance with the prevailing Canadian Forces Technical Order (CFTO) specification of the Navy, to conform to the individual shipyards' own unique tooling and construction methods. Neither does it contain any design work by Canadian equipment Suppliers to the indigenous ship build and outfit programs, this subject being covered elsewhere in the CANDIB Study activities..

The following chart contains all known warship design work during the period 1950 to 2002.



The foregoing chart covers the initial design and modification of all the warships listed below.

WARSHIP CLASS LISTING

COMPANY	DESIGN ACTIVITY	WARSHIP CLASS
Canadian Vickers	***NCDO/NSDA (1949-1974)***	
	St. Laurent class et al	**DE's thru DDH 280's**
	DE's to DDH's conversions	
	AOR's	**AOR 508's**
	Bonaventure refit	**22**
Vickers Stanwyck	***MDDO (1974-1976)***	
Versatile Vickers	***MDDO (1976-1987)***	
	DELEX refit (start)	
	"O" boats refit (SOUP)	**SSK 72's**
	Halifax Class (start)	**FFH 330's**
MIL Systems Engineering	***MDDO (1987-2002)***	
	DELEX refit (finish)	
	Halifax Class (finish)	**FFH 330's**
	TRUMP refit	**DDH 280's**
	MSA & GPAV conversions	
	"O" boats refit (SONAR)	**SSK 72's**
de Havilland	Bras d'Or	**FHE 400**
Saint John Shipbuilding Ltd	Halifax Class *	**FFH 330's**
Fenco MacLaren	Kingston Class	**MCDV 700's**

* SJSL is understood to have contracted *off-shore* the majority of their part of the basic ship design