



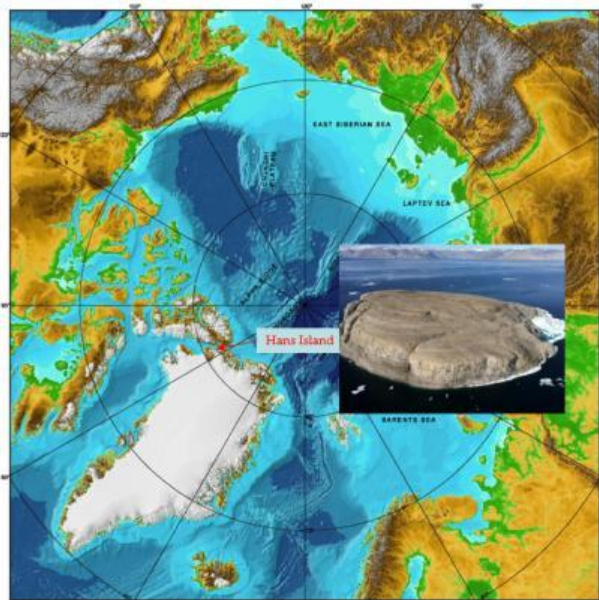
The Arctic/Offshore Patrol Ships

by Pat Devenish

(This is an edited version of a public presentation given by the author at the Maritime Museum of the Atlantic, 10 March 2015.)

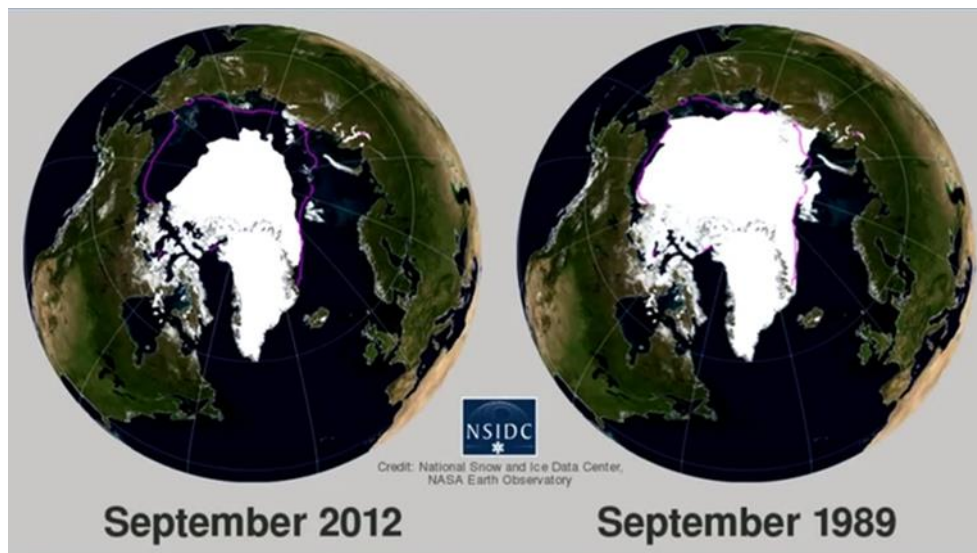
The aim of this paper is to provide some information about the Arctic/Offshore Patrol Ships (AOPS). The author does not purport to be an expert of all things AOPS nor will this paper answer questions on government procurement processes. The author's knowledge lies in recent experience of spending a year with the Canadian Surface Combatant (CSC) Project. Staff of the CSC Project worked together and shared a lot of information with those of the AOPS and Joint Support Ship projects. As well, there is a real and natural interest in this new capability that the Royal Canadian Navy is about to bring into its fold.

Canada's founding was based on European explorers searching for an easier way to the riches and markets of the Far East. Once they realized there was a huge land mass in their way, they were determined to find a way around it, a Northwest Passage. It took over 400 years before the Northwest Passage was fully navigated by Norwegian explorer Roald Amundson from 1903 to 1906. The main reason was that it was iced in for the better part of the year and so traffic was limited to relatively smaller vessels.



In recent decades however, the reduction of the Arctic ice pack, meaning that area where the ice never melts regardless of the season, has made the route a viable option for transoceanic trade. With this comes a requirement to 'police' through regulation and presence as are all sea lanes to ensure compliance with legal, safety and environmental regulations from both a local and an international perspective. The recent discovery of one of Franklin's ships, the EREBUS, as well as awareness of the Arctic in general, has raised indications that there may be a viable northern tourism trade as well.

Though Canada has never been considered by most of her residents to be an Arctic nation, she is indeed a northern nation and is one of only a handful of nations with legitimate claims to Arctic sovereignty. All Arctic land and therefore territorial waters belongs to one of five countries: Canada, the United States, Russia, Denmark and Norway. An island between Greenland and Ellsemere Island actually falls right on the international border between Denmark and Canada and is currently in dispute. Both Canadian and Danish teams have raised their respective national flags on Hans Island.



Depictions of the Arctic ice cap give an idea of the amount of reduction of ice in a little over 30 years (the pale purple lines in the pictures above is the extent of ice in 1979). Areas of Hudson Bay, as an example, for longer periods of the year are now open water whereas that was not the case even 15 years ago. How do we know this first hand? The local fauna is having to wait longer to trek out onto the ice in the fall for food in communities like Churchill and is therefore causing anxiety among residents.

This is far from the first time the Canadian Navy has looked north as a mandate. The development of Canada's first post-Second World War ships, the St Laurent class and follow on Restigouche, Mackenzie and Annapolis classes, was geared specifically for northern climates with systems like upper deck de-icing and steam intake injection. This was partly driven by the conditions of the expected operating areas of these vessels during the Cold War in the Greenland-Iceland-UK Gap but was also driven in part by the potential for them to patrol northern territorial waters when seasonal conditions permitted.

HMCS LABRADOR was purpose built based on the then-recent successful Wind class ice breaker of the United States Coast Guard. LABRADOR was conceived as Canada's first modern powerful ice breaking vessel and was intended to not only meet national defence needs but to also act as a platform to explore the Arctic. She was a self-sufficient exploration vessel equipped with state of the art laboratories, hospital, transport and rescue capabilities and a floating classroom as well. At the time of her commissioning, she was the world's most advanced ice breaker.



LABRADOR was built by Marine Industries in Sorel, Québec, laid down on 18 November 1949 and commissioned into the RCN 8 July 1954. Her maiden voyage in the summer of 1954 saw her sail from Halifax, NS, to the Labrador Sea, across the Arctic Archipelago to the Beaufort Sea and down to Esquimalt, BC, being the first large vessel and first warship to transit the Northwest Passage. After returning to Halifax by way of the Panama Canal, she also became the first vessel to circumnavigate the North American continent, arriving back in Halifax in November 1954.

Subsequent Arctic deployments included escorting other vessels carrying tonnes of materials for the construction of the Distant Early Warning line series of radar stations, as well as hydrographical studies. It was also during this time that she was involved in installing navigational markers.

In 1957, LABRADOR was transferred to the Department of Transport until the Canadian Coast Guard was formally established a few years later when she changed hands again to that new government department. LABRADOR continued to serve the Canadian Coast Guard in her main role as an exploration ship and floating laboratory for another 29 years finally being broken up in 1987.



In the late 1980s and early 1990s, a Defence White Paper indicating that nuclear submarines were a must for continued surveillance of Arctic waters triggered a cautious frenzy in the ranks of then Maritime Command. Would Canada enter that ‘unique club?’ With costs being a major factor, the public outcry of anything nuclear in the pristine Arctic, and the Royal Navy essentially willing to give away their four Upholder class conventionally powered submarines, the idea of nuclear submarines was shelved.

That said, in an off the cuff remark on Parliament Hill while Defence Minister, the Honourable Peter Mackay indicated that this may still be the future if Canada intends to exercise control of Arctic waterways.

The Scope

- Six to eight ships
- Infrastructure component includes upgrading jetty facilities at Halifax and Esquimalt, as well as the establishment of a berthing and fuelling facility in Nanisivik, Nunavut.
- New capability
 - Armed seaborne surveillance of Canada's waters including the Arctic
 - Provide situational awareness to the Government of Canada
 - Interoperability with other elements of the Canadian Armed Forces (CAF) and Other Government Departments (OGD) to assert and enforce Canadian sovereignty when and where necessary

The initial desire and that laid down in the Statement of Operational Requirement for the AOPS was always six to eight platforms. How they will be distributed coastally has yet to be determined. There will be one ship's company assigned to each ship.

This is a brand new capability to this generation of the Navy and therefore it promises to be a steep learning curve. That said, the past several years, each summer the Navy has sent ships north for regular exercises, and Canadian naval personnel have also ventured north in other vessels including those of the Canadian Coast Guard to learn valuable lessons and to gather corporate knowledge on Arctic operations.

In recent decades, Canada has had a limited military presence in the Arctic, and this has been at Alert at the top of Ellesmere Island. Ice bound and completely inhospitable, it is too far north to serve any type of support role to Canadian naval and Coast Guard vessels in the north. Included as part of the AOPS Project is the establishment of a support facility at Nanisivik, Nunavut, on the northern end of Baffin Island. The plan right now is for it not to be manned year around though support will be from the nearby community of Arctic Bay which has an airfield capable of landing an airlifter. The contractor is the Nunavut-based company Almiq, and planning and construction is on time to support the first Arctic deployment of HMCS HARRY DEWOLF in 2019.

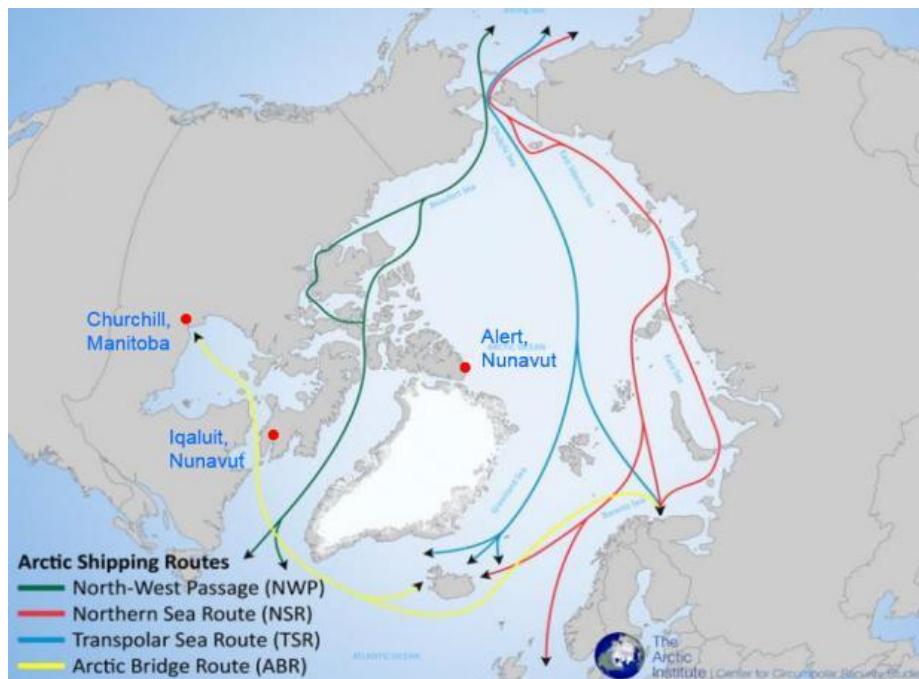


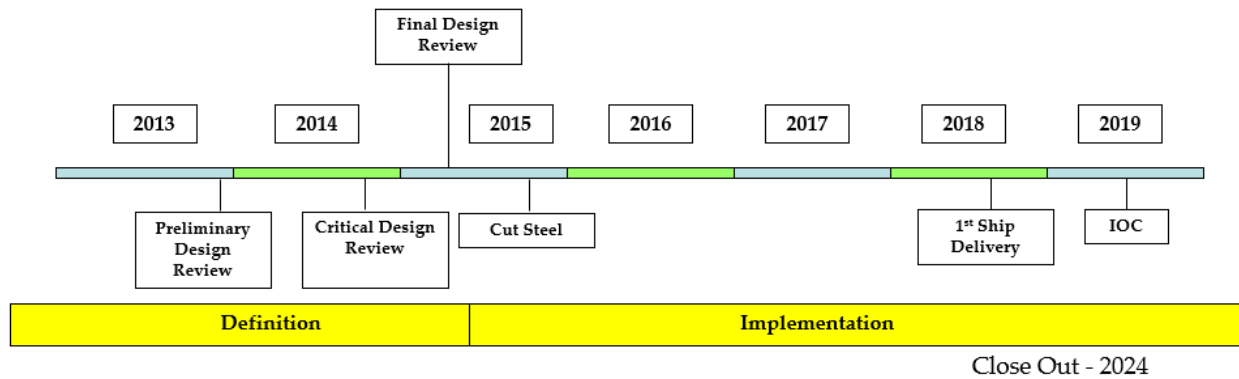


The ‘Missions’ depiction above looks a little confusing initially but if one looks at each mission mandate, it becomes clear. Does this mean that the AOPS will be an exclusive Arctic vessel? Not necessarily as it will be well suited for missions such as humanitarian assistance and disaster relief (HA/DR), and these can occur anywhere.

HMCS HARRY DEWOLF will be capable of providing limited command and control in support of a major HA/DR situation similar to Haiti or Hurricane Katrina.

The impetus for the ship’s design is for Arctic patrol. Shown below are routes currently utilized on a seasonal basis. The requirement for policing this sensitive area will only increase as the ice recedes, and the potential for resources will likely create disputes pertaining to ownership which will lead to a further requirement for patrolling the area.





AOPS has been on the minds of many since the mid-2000s, and a Project Management Office has been crewed since the first inception of the idea of an Arctic patrol vessel in 2007. With the formation of the National Shipbuilding and Procurement Strategy in June 2010, all three Navy projects gained momentum as well did plans for the Coast Guard. The design of the ship is fundamentally complete, and the vast majority of the marine and combat systems have been chosen. The next few months will see finalizing of critical details in preparation for commencement of construction. Treasury Board has authorized funding and the Navy and Irving Shipyard are on track to cut steel on the first module this fall with first ship delivery to the RCN scheduled for mid-2018.

Though they will be armed and carrying weapons for conducting boardings, the ships will be considered more as constabulary vessels vice warfighters.

The Design

- Constabulary role versus non-combatants
- Speed 17 knots
- Endurance 6800 nautical miles at 14 knots transit speed
- Ice classification Polar Class 5+ (1st year ice ~ 1 metre)
- Helicopter/aviation light helo for northern deployment
 - CH148 Cyclone on mission basis
- Operate effectively in open ocean and in ice
- Commercial vice military specifications
- Support to and interoperability with other government departments, Canadian Army

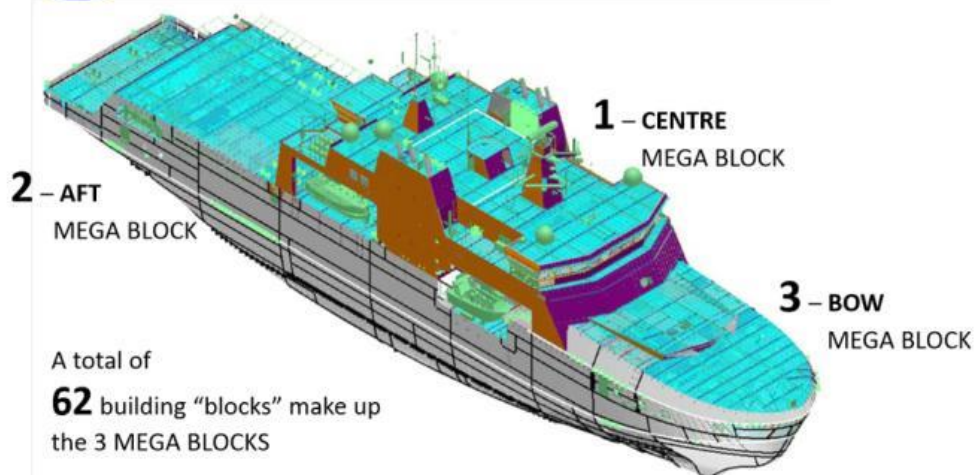
The ships will have:

- integrated propulsion management system, the same look and feel as the Halifax class frigates
- four 3600 kilowatts diesel generators
- two 4.5 megawatts propulsion motors
- one 1360 kilowatts diesel generator for harbour and emergency use
- two fixed pitch propellers
- two rudders
- a bow thruster
- fin stabilizers

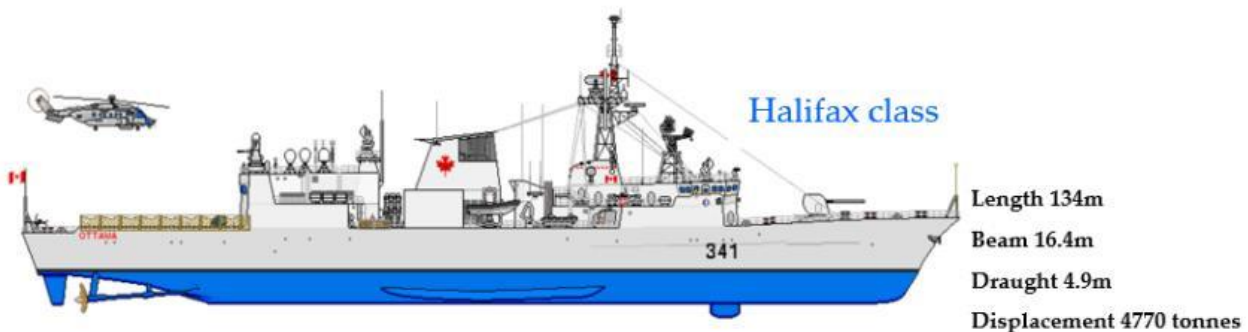
Each ship will be built in three sections totalling 62 blocks. No longer is the conventional keel laying process utilized in ship construction - even the huge Queen Elizabeth class aircraft carriers being built for the Royal Navy are built by this method. Blocks are joined together, and then the three mega block sections are joined together.



AOPS – Constructed in 3 Mega Blocks



Below are rough scale diagrams of the Harry DeWolf class in comparison to the Halifax and Kingston class vessels.



The following images outline important capabilities of the ship. It should be noted that these renderings were produced in 2009, and though they still represent the basic hull form and general arrangement of the vessel, the ship design has evolved and there are some notable differences in the current version. For example, the arrangement of antennas and fittings on the bridge top has changed considerably, and the extended bridge wings have been eliminated to better facilitate transit of the St Lawrence Seaway.



While it is possible that crewing may evolve over time, as delivered HDW is expected to be manned in accordance with this table. The RCN, as does any business, is constantly looking at ways to ensure optimal manning. Even now, over 20 years after their introduction, crewing reviews of the Halifax-class frigates are being studied.

AOPS POSITION	MOSID	RANK		OPERATIONS OFFICER (ORO)	MARS	LT(N)	
CO	MARS	CDR	Executive	NAVO/OOW	MARS	LT(N)	Operations
XO	MARS	LCDR		IMDO/OOW	MARS	LT(N)	
COXN	SEA GEN	CPO1		ZOOW 1	MARS	LT(N)	
PA	MED TECH-PA	PO1		ZOOW 2	MARS	LT(N)	
NTO	MS ENG	LT(N)	ZOOW 3	MARS	LT(N)		
NTO A/HOD	MS ENG	LT(N)	MET Forcaster/ICE Observer	MET TECH	SGT		
C ENG	MAR ENG	CPO2	SNR NCIOP (QL6B)	NCI OP	MS		
MCCO 1 (Cert 3)	MAR ENG	PO1	NCIOP 1/SAC	NCI OP	LS		
MCCO 2 (Cert 3)	MAR ENG	PO2	NCIOP 2	NCI OP	OS-LS		
MCCO 3 / FDER	MAR ENG	MS	NCIOP 3	NCI OP	OS-LS		
MCCO 4	MAR ENG	LS	SNR NAV COMM/CISN MANAGER	NAV COMM	PO1		
MCCO 5	MAR ENG	OS-LS	CISN ADMIN (QL6B)	NAV COMM	MS		
SNR ELECTRICIAN (QL6B)	E TECH	PO1	CISN OP 1	NAV COMM	LS		
SNR ET MAINTAINER	E TECH	PO2	CISN OP 2	NAV COMM	OS-LS		
ET 1 / IPMS TECH	E TECH	MS	CISN OP 3	NAV COMM	OS-LS		
ET 2/F DET	E TECH	LS	DECKO/OOW	MARS	LT(N)	Deck	
ET 3	E TECH	OS-LS	CBM (QL7)	BOSN	PO1		
ET 4	E TECH	OS-LS	POOW (QL6A)	BOSN	PO2		
SNR HT (QL6B)	HULL TECH	PO1	BOSN 1	BOSN	MS		
HT 2/IC	HULL TECH	PO2	BOSN 2	BOSN	MS		
HT1	HULL TECH	MS	BOSN 3	BOSN	LS		
HT2	HULL TECH	LS	BOSN 4	BOSN	LS		
HT3	HULL TECH	OS-LS	BOSN 5	BOSN	LS		
HT4	HULL TECH	OS-LS	BOSN 6	BOSN	OS-LS		
SNR W ENG TECH (QL6B)	W ENG TECH (COMM)	PO2	BOSN 7	BOSN	OS-LS		
WENG 1	W ENG TECH (ARM)	MS	BOSN 8	BOSN	OS-LS		
WENG 2	W ENG TECH (RAD)	LS	BOSN 9	BOSN	OS-LS	Logistics	
WENG 3	W ENG TECH (SON)	LS	LOGO	LOG	LT(N)		
WENG 4	W ENG TECH	OS-LS	SUPPLY TECH (QL6)	SUP TECH	PO1		
			WHAREHOUSE/VICUALLER	SUP TECH	OS-LS		
			CHIEF CLERK (QL5)	RMS	MS		
			NPP EXCG MGR (QL6A)	STWD	PO2		
			SENIOR COOK	COOK	PO2		
			GALLEY BUFFER	COOK	MS		
			COOK	COOK	OS-LS		

The AOPS will have a company of 65 with provisions for 22 more whether in the form of military, civilian or law enforcement teams or a combination thereof. Extra accommodations could also be provided in the form of pods carried on the quarterdeck in lieu of cargo.

What is left to be done? This year, finalisation of production drawings and the 3D model will give way to actual steel cutting. The final design review will take place mid-2015, with production to start in September 2015, likely involving a formal ceremony.

The Arctic/Offshore Patrol Ships will be a brand new capability for our Navy. In the role of Arctic patrol they may act as the catalyst to open the north up even more. Might Churchill or Iqaluit or even Resolute one day be Canada's northern capital, a thriving northern metropolis in a similar way that St John's is now?

Pat Devenish is a member of the Canadian Armed Forces with extensive experience in engineering and leadership positions afloat and ashore. This work is the sole opinion of the author and does not necessarily represent the views of the Canadian Department of National Defence and the Canadian Armed Forces. The author may be contacted by email at: RUSINovaScotia@gmail.com.