National Shipbuilding Procurement Strategy

SNAME Papers 2013-14

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Canadian Forces Naval Architect Exchange Officer
Army-Navy Country Club, Arlington, VA, 20 November 2013
Aim

• To give a Canadian perspective on its shipbuilding
  – National Shipbuilding Procurement Strategy (NSPS)
  – associated current acquisition projects
    • Royal Canadian Navy
    • Canadian Coast Guard
  – possible challenges and issues

• Bottom Line Up Front:
  – NSPS is a 30 year plan
  – recapitalizes several RCN & CCG classes
  – NSPS shipyards already ‘selected’
  – not ‘building’ ships yet
Outline

• Introduction / Historical Backdrop
• Challenge(s) / Direction / Organizations
• What is Canada’s NSPS?
  – “arrangements” vice contracts
  – both Navy (RCN) & Coast Guard (CCG) projects
• Shipyards “selected”…
• Project updates (AOPS, JSS, CSC, OFSV, OOSV, Polar Icebreaker, OPV, METMV)
• Discussion / Questions
Introduction / Historical Backdrop

**CANADA**
- Population ≈ 35 Million
- 2nd largest area (water+land)
- GDP ≈ $1.82 T
- Military ≈ $20.1 B (1.1%GDP)

**UNITED STATES**
- Population ≈ 317 Million
- Slightly smaller
- GDP ≈ $15.6 T
- Military ≈ $607 B (3.9%GDP)
Introduction / Historical Backdrop
Introduction / Historical Backdrop

• Naval Service Act of 4 May 1910
  – Bought 2 Cruisers from RN

• WW1
  – @ start = 330+ pers / 2 ships (+ 2 subs)
  – @ end = 8,826 pers / 7 ships, 4 subs, 100+ patrol boats

• WW2
  – @ start = 3,276 pers / 13 ships
  – @ VE Day = 95,000+ pers / 428 ships
  – @ VJ Day = <<<95,000 pers / 212 ships

• RCN had 4th largest navy (briefly) in 1945
Introduction / Historical Backdrop

• Post WW2 – Anti Submarine Role
• 1960’s – light aircraft carrier (decommissioned)
• 1970’s – *Iroquois* Class Destroyers
• 1980-1990’s – *Halifax* Class Frigates
  – St John Shipbuilding Ltd (boom)
  – unsuccessful at military sales (bust)
• 2000’s
  – RN *Upholder* Class (diesel-electric SSKs) submarines
  – VISSC ≈ up to $15B over 10 years
  – several strategy papers
  – Arctic
• 2010’s - NSPS
Introduction / RCN @ Present

DND (~43,365 military & ~32,035 reserves)
- RCN (~18,800 pers)
  - ~8400 Regular Force (Active Duty)
  - ~5100 Primary Reserve (Naval Reserve)
  - ~5300 civilians
- RCN Fleet ($\Delta \approx 95,000$ mt)
  - 15 Surface Combatants
  - 4 Submarines (diesel electric)
  - 2 Support Ships (tanker)
  - 12 Coastal Defence Vessels
  - 11 Patrol/Training Vessels + other Auxiliaries
Challenges Facing Canada

- Aging Fleets (RCN & CCG)
- Recapitalization efforts with fixed budgets
- Budget issues partly result of “Bust” & “Boom”
- Change is required -- affordability of new ships
- If NOT
  - Fleet renewal in jeopardy
  - Related marine sectors (direct and indirect) suffer

So … Canada is attempting a Procurement Strategy
National Shipbuilding Procurement Strategy

The Context:
- Canada needs to renew the Federal Fleets
- Shipbuilding Policy states that vessels will be procured, repaired and refitted in Canada
- Need for the elimination of project-by-project management resulting in inefficient “boom” and “bust” cycles

The Strategy:
- A strategic sourcing arrangement with two shipyards to build large vessels
- Small vessels will be competed to shipyards not affiliated with the yards selected to build large vessels
- Ship refit and repair work will be competed as per current procurement practices

The Benefits:
- Supports the industry’s sustainable development through a long-term approach to federal procurement
- Ensures that Canada’s needs for large vessels can be met
- Seeks long-term benefits over short-term fixes
The Strategy: Three Pillars of NSPS

• Large Vessel Pillar
  • 2 shipyards competitively selected
  • Irving Shipbuilding Inc. (Combatants: $29.3)
  • Vancouver Shipyards Ltd. (Non-Combatants: $7.3B)
  • Total ≈ up to 42 large vessels = $36.6B

• Small Vessel Pillar
  • Non-affiliated shipyards to competitively bid
  • ~116 smaller vessels worth $2B

• Ship Refit & Repair Pillar
  • Ship refit and repair work to be competed separately
  • $500 - $600M / year per current procurement practices
Umbrella Agreements (UA)

- UAs are *strategic sourcing arrangements* with the NSPS designated large vessel shipyards

- Provide a Framework (*business & relationship management*)
  - Establish conditions to support award of subsequent:
    - design contracts
    - build contracts
  - Support long-term planning
  - Support Shipyard Improvement (*at no cost to the Crown*)
  - Contain value proposition commitments
  - Support an expeditious issue resolution process

- UAs differ between shipyards
  - differences in management & work packages
Phased Approach to Shipbuilding

• Contracting to build ships in generally three phases:
  • **Phase 1: Ancillary Contracts**
    • understand the requirement and the initial design
  • **Phase 2: Production Engineering / Definition Contracts**
    • mature the design to ready for build
  • **Phase 3: Construction Contracts**
• Phased approach mitigates risks & unknowns
• Approach seeks to improve efficiency of shipbuilding process
NSPS – An Enabler of Benefits

- **Government is now pulling** naval projects to meet NSPS schedule
- Requires upgrading to only two shipyards
- Shipyards can do **long term planning & investment**
- Early Crown/Yard engagement on build projects
- **Better cost fidelity** at decision points
- Design-to-cost always possible
- Open discussion of **risk sharing & risk premiums**
- Reduced technical risk at build decision point
- **Open book** visibility for Crown to ensure value-for-money
- **Development of trust** is possible over time
What has been happening…

• **Shipyards** have:
  – **Hired senior staff** (including engineers, managers and production specialists)
  – Progressed with their **plans to improve** their physical **facilities**
  – **Engaged suppliers** through a registration process

• **Canada** has:
  – Been actively **maturing its ship requirements**
  – Reviewed its processes to ensure momentum is maintained
  – Been in continuous **communications with the shipyards** on the way ahead
  – **Hosted supplier engagement events** across the country to introduce companies to the shipyards
  – Put in place the governance necessary to realize the benefits of the NSPS

• **The Broader Marine Industry is:**
  – Participating in **supplier engagement** events
  – **Preparing for** supplier and sub-contracting **opportunities**
  – Participating in **Government hosted Industry days**
NSPS Key Milestones

✓ Ministerial Announcement – June 2010
✓ Establish a List of Potential Shipyards for the competitive RFP – Sept 2010
✓ Evaluation of Proposals and selection of two shipyards – Fall 2011
✓ Selected Shipyards Announcement – 19 October 2011
  • Irving Shipbuilding Inc for the Combat Package
  • Vancouver Shipyards Co. Ltd for the Non-Combat Package
✓ Finalize Umbrella Agreements with selected shipyard – February 2012
✓ Large Ship Announcement – 10 additional large Canadian Coast Vessel has been added to the Non-Combat work package – Oct 2013
✓ JSS vs Polar Icebreaker Announcement – RCN JSS build will start & end before start of CCG Polar Icebreaker at SeaSpan – Oct 2013
☐ Negotiate Individual Contracts for the first project in each work package
  • Arctic/Offshore Patrol Ship for the Combat Package
  • Offshore Fisheries Science Vessel for the Non-Combat Package
☐ Negotiate Individual Small Ship Contract for the numerous vessels with other shipyards
Challenges in Implementation

- **Expectation management** → For ship delivery & for Canadian content
- **Relationship building** → Culture change
- **Skills development** → Inside DND/RCN and in industry
- **Evolving Naval Materiel Assurance** → Keeping pace
- Greater reliance on a Classification Society → particularization still required
- Discipline around design changes → Sole source enables these = $$$
- Prime contractor model into the future → Allies are taking “prime” in-house
- Fleet-wide **common equipment fits** → Allies can not afford otherwise BUT have we the capacity?

- **In-service support** delivered by Industry through performance-based, incentivized and relational contract models → **Whole new world** – not utopian
- **International cooperation** → May be the only affordable way forward
Irving Shipbuilding Inc. (ISI) (aka HALSHIPS) Halifax, NS

- Privately-owned, established shipyard in Halifax, NS
  - Boom -- built HALIFAX & KINGSTON in 1990s
  - Bust -- St John Shipbuilding, NB closed by 2000
- Building Mid-Shore Patrol Vessels for CCG (non-NSPS)
- Multi-Ship Contract for HCM/FELEX midlife refits
- Selected for NSPS Combat Large Vessel Work Pkg

Rendering of a Concept Design completed by BMT Fleet Technology Ltd
Irving Shipbuilding Inc

Improvement plans over 3 yrs

- New buildings & piers
- 22,000m² (405m x 54m)
- Production capacity:
  - ONE x AOPS every 9 months
  - ONE x CSC every 15 months
Irving Shipbuilding Inc.

- 33m height clearance
Seaspan Shipyards
Vancouver / Victoria, BC

- Privately-owned, established shipyards
  - in Vancouver & Victoria, BC
- Refit/Repair DND ships & subs (in Victoria)
- Experience with CCG & commercial ships
- Navy refits – VISSC (Subs) & HCM/FELEX (mid-life refit / upgrade for Frigates)
- Selected for NSPS Non-Combat Large Vessel Pkg
Seaspan Shipyards
Vancouver Shipyards Ltd
Vancouver Shipyards Ltd

Improvement plans over 2 years
- completion by Oct 2014
- new buildings & erection area
- new facility will:
  - improve material flow
  - optimize work stations

Seaspan Careen Drydock
Opportunities for Broader Marine Industry

- Construction provides spill-over work (High Tech)
- Partners/Suppliers will be required
- Equipment is significant in construction cost
- THUS, suppliers have key role

Components (including weapons systems) sourced offshore (due to lack of availability in Canada) will be matched dollar for dollar by Canada Industrial and Regional Benefits (IRB) Policy
Update
Projects under NSPS
AOPS
Arctic / Offshore Patrol Ship
Arctic / Offshore Patrol Ship (AOPS)

**Purpose:**
- 6 - 8 vessels @ ≈ $3.1B
- to provide armed presence, surveillance and response in Canada’s EEZ, including the Arctic
- **Maritime Domain Awareness** - contribute to a networked Common Operating Picture (COP) for Canadian waters

**Miscellaneous:**
- design-then-build approach
- Includes ports (3) infrastructure

**Characteristics:**
- L / B / T / Δ103.6 / 19.0 / 6.0 [m] / 6,420 [t]
- Range / Max Speed 6,800 [NM] @14kts / 17 [kts]
- Endurance (food/JP5) 120 [days]
- Polar Classification PC5+ (Ice Capable – 1st Yr)
- **Integrated Diesel Electric Propulsion**
- Bow Thruster / Retractable Stabilization Fins
- **C4ISR - high latitude capable**
- Integrated Bridge Navigation System (IBNS)
- Command Management System (CMS)
- Gun 25mm , 2-D Radar
- **Helo capable** – normal light / Cyclone (HS-90) if req’d
- Boat capability to support RCMP ERT, SOF, SAR.
- **Flex space** (Aft) for deck cargo and 6 ISO containers
- Crew – 45 Core + 18 force generation positions

**Project Status:**
- Task-based Definition Contract (Mar 2013 – 30 months)
- Progressing through Preliminary Design Review now
- Seeking Task approvals for work under Definition Contract
- Securing approvals for Implementation Contract (Jan 2015)
- PDR (Dec 2103), CDR (Aug 2014), FDR (Apr 2015)
- Steel Cut (Sep 2015)
- 1st AOPS (2018), IOC 2019
## AOPS Milestones

<table>
<thead>
<tr>
<th>Milestones</th>
<th>Dates</th>
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<tbody>
<tr>
<td>Definition Contract Award</td>
<td>7 Mar 2013</td>
</tr>
<tr>
<td>Preliminary Design Review (<em>PDR</em>)</td>
<td>Dec 2013</td>
</tr>
<tr>
<td>Critical Design Review (<em>CDR</em>)</td>
<td>Aug 2014</td>
</tr>
<tr>
<td>Implementation Contract Award</td>
<td>Jan 2015</td>
</tr>
<tr>
<td>Final Design Review (<em>FDR</em>)</td>
<td>Apr 2015</td>
</tr>
<tr>
<td>“Cut Steel” Date</td>
<td>Sep 2015</td>
</tr>
<tr>
<td>1\textsuperscript{st} Ship Delivery</td>
<td>2018</td>
</tr>
<tr>
<td>Initial Operational Capability (<em>IOC</em>)</td>
<td>2019</td>
</tr>
<tr>
<td>Final Operational Capability (<em>FOC</em>)</td>
<td>2023</td>
</tr>
<tr>
<td>Project Close out</td>
<td>2024</td>
</tr>
</tbody>
</table>
AOPS – Challenges

• First build under NSPS
• Tight schedule
  – through multiple “complex” and “lengthy” approvals processes
• Maintaining affordability with the loss of purchasing power
  – Shipbuilding inflation & delays vs. contract ceiling
• Moving program forward with a small team
JSS
Joint Support Ship
JSS Project Mandate

• To recapitalize the PROTECTEUR Class
  – delivery of two JSS
  – option for a third if it is affordable or funds become available

• JSS will provide Canada with:
  – naval support capability
  – modern, task tailored, globally deployable
Joint Support Ship (JSS)

**Purpose:**
- 2 vessels @ ≈ $2.3B (with option for 3rd)
- at-sea support to deployed naval task groups
- Multi-purpose supply ship
  - fuel, stores, rations, ammo & medical svcs
- **Miscellaneous:**
  - MOTS (BERLIN Class with minor modifications)

**Characteristics:**
- L / B / T / Δ 173.7 / 24.0 / 7.4 [m] / 20,240 [t]
- Range ~10,800 NN @ ~14kts
- Speed 20 [kts] @ 90% MCR
- Endurance (food/fuel) 29 [days] for Task Group
- RAS Capability 2 x dual-purpose + stern fuel
- Crane lift 1 x SWL 24 [tonnes] (helo lift)
- Propulsion 2 x 7,200 kW, 2 x CPP
- Defense 2 x CIWS, 4 x NRWS
- Aviation Facilities 2 x Cyclone (CH148)
- Medical Facilities Role 2E Hospital
- Flex space 50+ TEU
- Crew 239

**Project Status:**
- Feb 2011: Design Concept (In-house + RFP MOTS)
- May 2013: Design Decision Point for final design
- Jul 2013: Contract to TKMS (MOTS)
- Ongoing: Contract negotiations & related discussions with VSY
- Ongoing: Preliminary Ship Design modifications from MOTS
  - Design & Production Engineering Contract (Jun 2014)
  - Construction Contract Award 2016 (target)
  - 1st JSS 2018 (projected)
  - IOC 2019 (projected), FOC 2020 (projected)
JSS – Challenges

- Transferring an existing, mature design to another shipyard
- Complexities of the non-combat work package
  - to accomplish multiple objectives in a single shipyard
  - CCG builds (OFSV, OOSV, Polar Icebreaker)
- SOR vs. MOTS design with minor modifications
CSC
Canadian Surface Combatant
Canadian Surface Combatant (CSC)

Purpose:
• Up to 15 vessels @ ≈ $26.2B
  • Area Air Defence/Task Group C2
  • General Purpose
• replacement of IROQUOIS & HALIFAX Classes
• in support of Canada First Defence Strategy - 2008

Miscellaneous:
• design-then-build approach
• Industry Engagement early on
• still early stages of Definition

Characteristics:
• L / B / T / Δ <155 / <20.3 / ?? [m] / ?? [t]
• Minimum Range (tbd) 5,500 – 6,200 [NM] @ 18 kts
• Max Speed not less than 30 [kts]
• Ambient Conditions: -42°C(0%RH) → +50°C(100%RH)
• Propulsion: Hybrid, Full Electric, Conventional
• Sensors: suitable to mission
• Aviation Facilities: 1 or 2 Cyclone (CH148)
• Accommodate UXVs
• Crew (AAD/TG): ~255 (200 core / 55 mission)
• Crew (GP): ~230 (190 core / 40 mission)
• Environmental: IMO Tier III, Ballast, Oil Tank, etc…

Project Status:
• Approval to Project Definition
• Industry Engagements ongoing
  • Steel Cut (2020)
  • delivery 1st CSC (2025)
CSC – Challenges

• Design & build of two variants
  – Area Air Defence/Task Group Command & Control
  – General (Multi) Purpose
• Complex systems for build & integration
• New ILS and training requirements
• Not the 1st build under NSPS, but … will be complex
• Acquire necessary expertise & human resources
CSC – Next Steps

• Approval for the CSC procurement approach
  – Recommendation to project governance (Fall 2013)
• Continued Technical Industry Engagement
  – 3 completed so far
  – Another early next year
• Ongoing review of Statement of Requirements
• Follow on Definition Phase
Offshore Fisheries Science Vessels

- Acquisition of 3 xOFSVs
- to replace 4 aging ships (Pacific & Atlantic)
- to support critical scientific research and ecosystem-based management
- to conduct fisheries and oceanographic survey missions (sampling <2500m depth)
- Sea State 6 capable + Polar Class 7

### Vessel Particulars (not official)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>L / B / Tmax</td>
<td>~63.4 / &lt;16.0 / &lt;6.5 [meters]</td>
</tr>
<tr>
<td>Displacement</td>
<td>~2650 [tonnes]</td>
</tr>
<tr>
<td>Speed (Max)</td>
<td>~13 [kts]</td>
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<tr>
<td>Range</td>
<td>~6,400 [NM] @ ?? kts</td>
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<tr>
<td>Propulsion</td>
<td>Diesel Electric, single shaft, bowthrust, 3 x 1500 [kW]</td>
</tr>
<tr>
<td>Construction</td>
<td>Steel hull</td>
</tr>
<tr>
<td>Crew (core/science)</td>
<td>up to 35 (21 / 13 / + 1 spare)</td>
</tr>
</tbody>
</table>

### Project Status

- Jan 2011: Conceptual Design
- Nov 2011: Contract awarded (VSY)
- Feb 2013: Construction Engineering Phase

**Target Dates:**
- 2015: Effective Project Approval
- Apr 2016: 1st OFSV Delivery
- Sep 2016: 2nd OFSV Delivery
- Jan 2017: 3rd OFSV Delivery
### OFSV Principal Particulars

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOA:</td>
<td>55 - 65 m</td>
</tr>
<tr>
<td>Beam:</td>
<td>16.0 m</td>
</tr>
<tr>
<td>Depth:</td>
<td>8.7 m</td>
</tr>
<tr>
<td>Draft:</td>
<td>6.1 m</td>
</tr>
<tr>
<td>Displacement:</td>
<td>2602 t</td>
</tr>
<tr>
<td>Installed Power:</td>
<td>4500 kW (3 X 1500 kW)</td>
</tr>
<tr>
<td>Accommodations:</td>
<td>34 (21 crew / 13 science &amp; supernumerary)</td>
</tr>
<tr>
<td>Speed:</td>
<td>13 knots</td>
</tr>
<tr>
<td>Range:</td>
<td>6000 nm</td>
</tr>
<tr>
<td>Endurance:</td>
<td>31 days</td>
</tr>
<tr>
<td>Fuel Oil Capacity</td>
<td>365 m$^3$</td>
</tr>
<tr>
<td>Fresh Water Capacity</td>
<td>38 m$^3$</td>
</tr>
<tr>
<td>Lub Oil Capacity</td>
<td>4.8 m$^3$</td>
</tr>
<tr>
<td>Water Ballast Capacity</td>
<td>443 m$^3$</td>
</tr>
<tr>
<td>Lightship with margins:</td>
<td>2028 t</td>
</tr>
<tr>
<td>Propulsion, integrated electric with single bow thruster:</td>
<td>2250 kW</td>
</tr>
<tr>
<td>Berths Available:</td>
<td>35</td>
</tr>
<tr>
<td>Anti-roll tank</td>
<td></td>
</tr>
</tbody>
</table>
OOSV
Offshore Oceanographic Science Vessel
Offshore Oceanographic Science Vessel

- 1 x OOSV (with option for 1 more)
- replaces CCG’s largest science vessel
- to support the science mandate of the Department of Fisheries & Oceans
- to conduct oceanographic, geological and hydrographical survey missions
- long “at-sea” endurance (~84 days)
- Sea State 6 capable + Polar Class 7

**Vessel Particulars (not official)**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>L / B / Tmax</td>
<td>~78.1 / ~16.0 / ~6.1 [meters]</td>
</tr>
<tr>
<td>Displacement [t]</td>
<td>~3680 [tonnes]</td>
</tr>
<tr>
<td>Speed (Max)</td>
<td>~14 [kts]</td>
</tr>
<tr>
<td>Range</td>
<td>~13,250 [NM] @ ~12 kts</td>
</tr>
<tr>
<td>Propulsion</td>
<td>Diesel Electric with azimuthing thrusters + single bowthruster, 3 x 1290 [kW]</td>
</tr>
<tr>
<td>Construction</td>
<td>Steel hull</td>
</tr>
<tr>
<td>Crew (core/science)</td>
<td>up to 56 (33 / 23)</td>
</tr>
</tbody>
</table>

**Project Status**

- 2011: Conceptual Design
- Nov 2011: Contract awarded (VSY)

**Target Dates:**
- Jun 2014: Construction Engineering Contract
- Jun 2015: Long Lead Item Contract
- Jun 2016: Construction Contract Award
- Sep 2017: OOSV delivery
## OOSV Vessel Principal Particulars

<table>
<thead>
<tr>
<th>Category</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOA</td>
<td>78.1m</td>
</tr>
<tr>
<td>Beam</td>
<td>16m</td>
</tr>
<tr>
<td>Depth</td>
<td>9.1m</td>
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<tr>
<td>Draft</td>
<td>6.05m</td>
</tr>
<tr>
<td>Displacement</td>
<td>3680 t</td>
</tr>
<tr>
<td>Installed Power</td>
<td>3870 kW (3 x 1290 kW)</td>
</tr>
<tr>
<td>Accommodations</td>
<td>56 (33 crew / 23 science &amp; supernumerary)</td>
</tr>
<tr>
<td>Speed</td>
<td>13.7 knots @ 100% MCR</td>
</tr>
<tr>
<td>Range</td>
<td>13250 nm @ 12.0 knots</td>
</tr>
<tr>
<td>Endurance</td>
<td>84 days (resupplied with perishable foods after 42 days)</td>
</tr>
<tr>
<td>Fuel Oil Capacity</td>
<td>642 m3</td>
</tr>
<tr>
<td>Fresh Water Capacity</td>
<td>78 m3</td>
</tr>
<tr>
<td>Lub Oil Capacity</td>
<td>8.7 m3</td>
</tr>
<tr>
<td>Water Ballast Capacity</td>
<td>772 m3</td>
</tr>
<tr>
<td>Lightship with margins</td>
<td>2600 t</td>
</tr>
<tr>
<td>Anti-roll tank.</td>
<td></td>
</tr>
<tr>
<td>Diesel Electric with Azimuthing Thrusters and single bow thruster.</td>
<td></td>
</tr>
</tbody>
</table>
Polar Icebreaker
C CGS *John G. Diefenbaker*
• to replace CCG’s Heavy Icebreaker
• capable of 3-season Arctic Ops
• capable of more difficult ice conditions
• focus on strengthening Canada’s
  – Arctic sovereignty
  – economic & social development
  – governance
  – environmental protection

**Vessel Particulars (not official)**

<table>
<thead>
<tr>
<th>L / B / T</th>
<th>~149.0 / ~28.0 / ~11.0 [meters]</th>
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<tbody>
<tr>
<td>Displacement</td>
<td>~16,000 [tonnes]</td>
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<tr>
<td>Speed (Max / Ice)</td>
<td>~18 / ~3-4 [kts]</td>
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<tr>
<td>Range</td>
<td>~ [NM] @ 14 kts</td>
</tr>
<tr>
<td>Propulsion</td>
<td>2 CPP, ~40-50 [MW] Fully Integrated Diesel Electric</td>
</tr>
<tr>
<td>Construction</td>
<td>Steel Hull</td>
</tr>
<tr>
<td>Crew (core/ops/surge)</td>
<td>60 / 40 / 25</td>
</tr>
</tbody>
</table>

**Build intent - West**

**Project Status (affected by JSS)**

- Jan 2011: Conceptual Design
- Nov 2011: Contract awarded (VSY)

**Rescheduled dates unknown @20 Nov 2013**

- Apr 2014: Effective Project Approval
- Jun 2014: Construction Engineering Contract
- Apr 2015: Construction Contract Award
- Jun 2017?: Polar Icebreaker delivery
OPV
Mid-shore Patrol Vessel
OffShore Patrol Vessel (OPV)

- To replace “Offshore Patrol” CCG vessels
- Large, all-weather, offshore ice-strengthened
- Self-sustaining for ~6 weeks at sea
- Primary role:
  - Fisheries protection (Cdn waters & high seas)
- Also capable of:
  - search and rescue
  - aids to navigation support
  - environmental response

**Vessel Particulars (not official)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>L / B / T</td>
<td>~75 / xx / xx [meters]</td>
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<tr>
<td>Displacement [t]</td>
<td>xx [tonnes]</td>
</tr>
<tr>
<td>Speed (Max/Cruise)</td>
<td>xx / xx [kts]</td>
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<tr>
<td>Range</td>
<td>xxxx [NM] @ xx kts</td>
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<tr>
<td>Propulsion</td>
<td>tbd</td>
</tr>
<tr>
<td>Construction</td>
<td>tbd</td>
</tr>
<tr>
<td>Crew</td>
<td>tbd</td>
</tr>
</tbody>
</table>

**Project Status**

- ??: Contract awarded (ISI)
- ??: Preliminary Design Review
- ??: Final Design Review
- ??: Steel Cutting
- ??: 1st MEMTV delivery
- ??: Final MEMTV delivery

Build intent - West
MEMTV

Medium Endurance Multi-Tasked Vessel
Midium Endurance Multi-Tasked Vessel (MSPV)

• To replace “Marine Service” CCG vessels
• Large, shallow draft vessels
• Self-sustaining for ~4 weeks at sea
• Primary role:
  – deploy / recover / maintain aids to navigation
• Also capable of:
  – search and rescue
  – fisheries management
  – environmental response

<table>
<thead>
<tr>
<th>Vessel Particulars (not official)</th>
<th>Project Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>L / B / T ~65 / xx / xx [meters]</td>
<td>• ??: Contract awarded (ISI)</td>
</tr>
<tr>
<td>Displacement [t] xx [tonnes]</td>
<td>• ??: Preliminary Design Review</td>
</tr>
<tr>
<td>Speed (Max/Cruise) xx / xx [kts]</td>
<td>• ??: Final Design Review</td>
</tr>
<tr>
<td>Range xxxx [NM] @ xx kts</td>
<td>• ??: Steel Cutting</td>
</tr>
<tr>
<td>Propulsion tbd</td>
<td>• ??: 1st MEMTV delivery</td>
</tr>
<tr>
<td>Construction tbd</td>
<td>• ??: Final MEMTV delivery</td>
</tr>
<tr>
<td>Crew tbd</td>
<td></td>
</tr>
</tbody>
</table>
Summary / Conclusions

- NSPS is leveraging synergies in shipbuilding
  - to avoid history of Boom and Bust cycle for Canadian Shipbuilding industry
- Canada to build new Federal Fleet under NSPS (30 years)
  - up to 41 large vessels (~$36.6B)
    - RCN (up to 26): AOPS, JSS, CSC
    - CCG (up to 15): OFSV, OOSV, Polar Icebreaker, OPV, MEMTV
  - up to 116 smaller vessels (~$2B)
- Shipyards selected (*fair & transparent process*):
  - Irving Shipbuilding Inc (Halifax, NS)
    - AOPS in Project Definition – target delivery of 1st ship = 2018
    - CSC ongoing
  - Seaspan Marine (Vancouver, BC)
    - OSFV / OOSV in Project Definition – target delivery 1st ship = 2015 / 2017
    - JSS in Project Definition – target delivery 1st ship = 2018
    - Polar Icebreaker / OPV / MEMTV ongoing
- Normal ancillary contracts awarded at various stages
- ISSC contracts not yet finalized (*substantial*)
- Canadian, US & international industry players becoming involved

"Consider Canada like your attic:
... you know it is up there
... you do not look up there much
BUT ... when you do, you find a lot of interesting stuff"
Questions and Discussion

“We are what we do …
… NOT what we say we are.”

Isadore Sharpe, founder Four Seasons Hotel
How to Become Involved?

General Information (official site)
• “the Source”
• all information on this site is in the public domain

Large Vessel Construction
• Irving Shipbuilding (online Supplier Registry):
• Vancouver Shipyards (Supplier Registration):
http://www.seaspan.com/supplier_registration.php

Smaller Vessel Construction & In-Service Support Contracts (ISSC)
• Will be tendered on a project by project basis through a competitive process
• Public Works & Government Services Canada (PWGSC) coordinates
  – advertised through their Buy and Sell webpage at
https://buyandsell.gc.ca/

Another potential point of contact: Canadian Shipbuilding Association
  – with respect to industry insight
  – possible supplier arrangements with Canadian shipyards

presented by: LCDR Robert D’Eon: robert.deon.ca@navy.mil
Backup / Spare Slides
## NSPS – Large Surface Combatants (SCs)

<table>
<thead>
<tr>
<th>Ship Class (project budget)</th>
<th>Number of vessels</th>
<th>Target Date for Construction Contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arctic Offshore Patrol Ships ($3.1B)</td>
<td>6 - 8</td>
<td>2015</td>
</tr>
<tr>
<td>Canadian Surface Combatants ($26.2B)</td>
<td>Up to 15</td>
<td>2018</td>
</tr>
<tr>
<td>Total Values: Combat Vessels ($29.3B)</td>
<td>Up to 23</td>
<td></td>
</tr>
</tbody>
</table>

### NSPS – Large Non-SCs & Auxiliaries

<table>
<thead>
<tr>
<th>Ship Class (project budget)</th>
<th>Number of vessels</th>
<th>Target Date for Construction Contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offshore Fisheries Science Vessels ($0.244B)</td>
<td>3</td>
<td>2014</td>
</tr>
<tr>
<td>Offshore Oceanographic Science Vessel ($0.144B)</td>
<td>1</td>
<td>2015</td>
</tr>
<tr>
<td>Joint Support Ships (RCN) ($2.3B)</td>
<td>2</td>
<td>2016</td>
</tr>
<tr>
<td>Polar Icebreaker ($1.3B)</td>
<td>1</td>
<td>2018</td>
</tr>
<tr>
<td>Offshore Patrol Vessels ($1.9B)</td>
<td>up to 5</td>
<td>TBD</td>
</tr>
<tr>
<td>Medium Endurance Multi-Tasked Vessels ($1.4B)</td>
<td>up to 5</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Total Value: Large Non-Combat Vessels ($7.3B)</strong></td>
<td>up to 17</td>
<td></td>
</tr>
</tbody>
</table>
National shipbuilding = RCN + CCG

**RCN** ≈ 20+ warships / **CCG** ≈ 15 fleet vessels

- **RCN** warships
  - CSC: up to 15 ships
  - AOPS: 6-8 ships
  - JSS: 2-3 ships

- **CCG** fleet ships
  - OFSV x 3, OOSV x 1, Polar Icebreaker x 1
  - OPV x ~5, MEMTV x ~5

- **+ 116** smaller vessels
Arctic/Offshore Patrol Ships (AOPS)

- Conduct armed sea-borne surveillance in Canada’s EEZ
- Acquisition budget - $3.1B
- Associated jetty infrastructure (Nanisivik, Halifax & Esquimalt)
- Currently in a 30-month Definition Contract (March 2013)
- 2015 – Construction Contract Award target
- 2018 – 1st AOPS delivery target
Arctic Offshore Patrol Ship

- Helo capable
- Space for up to 6 TEUs & landing craft (11m)
- Vehicle Stowage
- Work/Rescue Boats (8.5m)
- Mission Fit Boat Bays
  - Boarding/Assault Boats (12m)
  - High Latitude Lifeboats (12m)
Model Testing Of Hull Form

- Demonstrating the Model can turn in 1.2 m of ice
AOPS Marine Systems Capabilities

- Principal Particulars
  - Length 103.6 m
  - Beam 19.0 m;
  - Design Draught 6421 tonnes
- Polar Class 5 – ice capable, not an ice-breaker
- Open Water Speed of 17 knots
- Range of least 6,800 nautical miles
- Integrated Diesel Electric Propulsion/Bow Thruster
- IPMS/DCS
- Retractable Stabilization Fins
- Small boats/Vehicles/Mission packages
AOPS Combat Systems Capabilities

- Integrated Bridge Navigation System (IBNS)
- Combat Management System (CMS)
- X & S-Band Navigation Radars with Ice/Low Observables Processing
- 2-D Surveillance/Helo Control Radar with IFF
- EO/IR Sensor, AIS, SAR Direction Finder
- Integrated Internal/External Comms
- 4 HF Tx/Rx, 4 HF Rx, 6 UHF Radios, Mil SATCOM
- 25mm Main Gun
- Commercial Satellite & Internet
AOPS - Challenges

• Maintaining schedule through multiple complex and lengthy approvals processes
• Maintaining affordability with the loss of purchasing power
• Moving program forward with a small team
• Establishing a long-term relationship between GoC and ISI
• Incorporating a Certification Plan after requirements have been set
AOPS Jetty Infrastructure

B Jetty Esquimalt
- Designed to berth 2 x AOPS (1 alongside nested)
  - 2 subs + 1 JSS
  - Potential 3rd AOPS berthed at C Jetty
- Projected Cost $450 M
  - includes A jetty refurbishment (joint RCN)
- Currently in Definition Phase
- Three phase implementation in place
  (utility corridor, B jetty and A jetty)

Jetty NJ Halifax
- Designed to berth 4 x AOPS
  - 2 alongside nested
- Projected cost $100 M
- Design nearing completion
- Contract Award in 2014
Nanisivik Naval Facility

2008 – 2009: Environmental Studies/Tech Assessments
2010: Facility Design Options Analysis Complete
2013: Facility Definition Design Complete
2014: Award construction contract
2014: Contractor mobilizes to site in late summer
2015: First year full construction
2016: Second year full construction
2017: Final year. Demobilization and IOC
2018: FOC
Dutch Harbour to Beaufort via Bearing Strait 1800nm (North of Inuvik)

Esquimalt to Dutch Harbour 1646 nm

Nanisivik to Beaufort via NWP 900nm

Nanisivik to Beaufort via NWP 1400nm (Southern Route)

Nanisivik to Iqaluit 1100nm (by sea - 3 days)

Nanisivik to Iqaluit via NWP 1400nm (Southern Route)

Inuvik

Resolute

Hans Island

Pond Inlet

St. Johns NF to Nanisivik 2005nm

Halifax to St. Johns NF 700nm

Esquimalt (545 nm)
JSS Design (based on FGS BONN)

- Length overall: 173.70 m
- Breadth moulded: 24.00 m
- Design draught: 7.40 m (delivery)
- Full load displ.: 20,240 t (delivery)
- Speed: 20 kt at 90 % MCR
- Complement: 239

- Propulsion: 2 MTU diesel engines with 7,200 kW
  2 controllable pitch propellers
- Cranes: 2 cranes SWL 24 t / 1 crane SWL 24 t
- Helicopter: Hangar for 2 x Helicopters
  (Sea King or MH90) with Helicopter Handling System / 2 Cyclone
- Weapon: 4 x MLG 27mm / 4 x RCN 50 Cal RCG
  2 x Rolling Airframe Missile (S&W) / 2 x Phalanx
- IMO Tier II / Space and Weight IMO Tier III
- MARPOL compliant
Design Decision

Decision Panel unanimously agreed

– JSS Project Manager & JSS Project Director
– PWGSC
– Industry

• given that **capability** of MOTS is **acceptable** to RCN:
  • probability of program success judged to be:
    • more likely
    • more manageable

BERLIN Class (TKMS) design demonstrates value through:

• best overall combination of
  – Capability
  – Suitability
  – Level of risk
  – Confidence of affordability within the allocated project budget.
Standard Project Stages - Activity

- **Identification**
  - Project Starts
  - Identify capability deficiency
  - Capability based planning validation
  - Determine the Policy cover
  - Identify the resources
  - Highlight the risks

- **Options Analysis**
  - Start Def’n
  - Formulate Options
  - Assess costs & benefits
  - Examine risk
  - Select option
  - Identify the best business deal for DND

- **Definition**
  - Start Impl’n
  - Detailed review, risk assessment & costing
  - Implementation planning

- **Implementation**
  - FOC
  - Implementation management & monitoring
  - Procurement strategies
  - Status reports

- **Close Out**
  - PCR
  - Capture lessons learned
  - Close-out activities
CSC
Strategic Direction

Stated in the “Canada First Defence Strategy”, 12 May 2008

Canada is committed to:

“replace Canada’s destroyers and frigates. While all these vessels will be based on a common hull design, the frigate and destroyer variants will be fitted with different weapons, communications, surveillance and other systems. These new ships will ensure that the military can continue to monitor and defend Canadian waters and make significant contributions to international naval operations.”
CSC – Technical Industry Engagement

- Upfront engagement to solicit input from private sector with *experience in specific technical elements* related to the CSC
- Priority 1:
  - Obtain Industry feedback on CSC draft high level requirements
    - more informed System Requirements Document (SRD)
- Priority 2:
  - Solicit Industry for information in specific areas to better inform production of the CSC SRD
- Optimize communications between PMO & Industry
- Gain an understanding of resident Industry capabilities
CCG

Vessels
Polar Icebreaker
# Ice and Cold Operations Rules

## Ice Operations (Ice Class)

<table>
<thead>
<tr>
<th>Approx Ice Thickness, m</th>
<th>Light Ice</th>
<th>First-Year Ice</th>
<th>Multi-Year Ice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baltic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.4</td>
<td>1E</td>
<td>1C FS</td>
<td>1C FS(+)</td>
</tr>
<tr>
<td></td>
<td>1D</td>
<td>1B FS</td>
<td>1B FS(+)</td>
</tr>
<tr>
<td>0.6</td>
<td>0.3-0.7</td>
<td>1A FS</td>
<td>1A FS(+)</td>
</tr>
<tr>
<td>0.8</td>
<td>0.7-1.2</td>
<td>1AS FS</td>
<td>1ASFS(+)</td>
</tr>
<tr>
<td>1.0</td>
<td>0.7-1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Cold Operations (Winterisation)

<table>
<thead>
<tr>
<th>Temp. Degs. C</th>
<th>Equipment and Systems</th>
<th>Hull Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Down to -30</td>
<td>Winterisation C(₄)</td>
<td>Winterisation H(₄)</td>
</tr>
<tr>
<td>-31 to -45</td>
<td>Winterisation B(₄)</td>
<td></td>
</tr>
<tr>
<td>-46 &amp; below</td>
<td>Winterisation A(₄)</td>
<td></td>
</tr>
</tbody>
</table>

**Severity of Conditions**

__Polar Icebreaker__
### Example of equivalence table

<table>
<thead>
<tr>
<th>Classification Society</th>
<th>Ice Class</th>
<th>Category II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finnish-Swedish Ice Rules</td>
<td>1A Super</td>
<td>1B</td>
</tr>
<tr>
<td>Russian Maritime Register of Shipping (Rules 1995)</td>
<td>L1</td>
<td>L2</td>
</tr>
<tr>
<td>Russian Maritime Register of Shipping (Rules 2008)</td>
<td>Arc 4</td>
<td>Ice 1</td>
</tr>
<tr>
<td>American Bureau of Shipping</td>
<td>A0</td>
<td>Ice class D0</td>
</tr>
<tr>
<td>Bureau Veritas</td>
<td>1A</td>
<td>1C</td>
</tr>
<tr>
<td>American Bureau of Shipping</td>
<td>Ice class 1B</td>
<td>Ice class C0</td>
</tr>
<tr>
<td>CASPRR, 1972</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>China Classification Society</td>
<td>Ice Class B1</td>
<td>Ice Class B1</td>
</tr>
<tr>
<td>Det Norske Veritas</td>
<td>ICE-1A</td>
<td>ICE-1B</td>
</tr>
<tr>
<td>Det Norske Veritas</td>
<td>ICE-10</td>
<td>ICE-1C</td>
</tr>
<tr>
<td>Det Norske Veritas</td>
<td>ICE-C</td>
<td></td>
</tr>
<tr>
<td>Germanischer Lloyd</td>
<td>E4</td>
<td>E2</td>
</tr>
<tr>
<td>Germanischer Lloyd</td>
<td>E3</td>
<td>E1</td>
</tr>
<tr>
<td>Korean Register of Shipping</td>
<td>IS5</td>
<td>IS2</td>
</tr>
<tr>
<td>Korean Register of Shipping</td>
<td>IS1</td>
<td>IS3</td>
</tr>
<tr>
<td>Korean Register of Shipping</td>
<td>IS4</td>
<td></td>
</tr>
<tr>
<td>Lloyd’s Register</td>
<td>1A</td>
<td>1B</td>
</tr>
<tr>
<td>Lloyd’s Register</td>
<td>1A</td>
<td>1B</td>
</tr>
<tr>
<td>Polish Register of Shipping</td>
<td>L1A</td>
<td>L2</td>
</tr>
<tr>
<td>Polish Register of Shipping</td>
<td>L1</td>
<td>L2</td>
</tr>
<tr>
<td>Nippon Kaiji Kyokai</td>
<td>IA Super</td>
<td>IA</td>
</tr>
<tr>
<td>Nippon Kaiji Kyokai</td>
<td>IB</td>
<td>IC</td>
</tr>
<tr>
<td>Registro Italiano Navale</td>
<td>IAS</td>
<td>IB</td>
</tr>
<tr>
<td>Registro Italiano Navale</td>
<td>IAS</td>
<td>IC</td>
</tr>
<tr>
<td>Icebreaking capability, cm</td>
<td>&gt;50</td>
<td>30-50</td>
</tr>
<tr>
<td>Icebreaking capability, cm</td>
<td>15-30</td>
<td>10-15</td>
</tr>
</tbody>
</table>
Comparison between different rules for ice strengthening.
Carried out by Krylov Institute in St Petersburg

PC1: $t_{\text{ice}} \approx 3.0$ m

PC2: $t_{\text{ice}} \approx 3.0$ m

PC3: $t_{\text{ice}} \approx 2.5$ m

PC4: $t_{\text{ice}} \approx 1.2$ m

PC5: $t_{\text{ice}} \approx 0.7–1.2$ m

PC6: $t_{\text{ice}} \approx 0.7–1.2$ m

PC7: $t_{\text{ice}} \approx 0.3–0.7$ m
### DNV rules for ice / arctic class

<table>
<thead>
<tr>
<th>DNV Class Notations</th>
<th>Equivalent Baltic Ice class</th>
<th>IACS Polar Class</th>
<th>Ice Conditions</th>
<th>Impact Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICE-C / E</td>
<td></td>
<td></td>
<td>Very light ice condition</td>
<td></td>
</tr>
<tr>
<td>ICE-1C</td>
<td></td>
<td></td>
<td>First year ice and assisted operation</td>
<td>No ramming</td>
</tr>
<tr>
<td>ICE-1B</td>
<td></td>
<td></td>
<td>0.4 m ice thickness</td>
<td></td>
</tr>
<tr>
<td>ICE-1A</td>
<td></td>
<td>PC7</td>
<td>0.8 m ice thickness</td>
<td></td>
</tr>
<tr>
<td>ICE-1A*</td>
<td></td>
<td>PC6</td>
<td>1.0 m ice thickness</td>
<td></td>
</tr>
<tr>
<td>ICE-1A*F</td>
<td></td>
<td></td>
<td>1.0 m ice thickness</td>
<td></td>
</tr>
<tr>
<td>ICE-05</td>
<td></td>
<td>PC5</td>
<td>First year ice with pressure ridges</td>
<td>Occasionally</td>
</tr>
<tr>
<td>ICE-10</td>
<td></td>
<td>PC4</td>
<td></td>
<td>Repeated ramming</td>
</tr>
<tr>
<td>ICE-15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POLAR-10</td>
<td></td>
<td>PC3</td>
<td>Multi year ice with glacial inclusions</td>
<td></td>
</tr>
<tr>
<td>POLAR-20</td>
<td></td>
<td>PC2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POLAR-30</td>
<td></td>
<td>PC1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICEBREAKER</td>
<td></td>
<td>PC1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*NOT DIRECTLY COMPARABLE*
## Canadian Coast Guard

### Polar Class

<table>
<thead>
<tr>
<th>Polar Class</th>
<th>General Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC 1</td>
<td>Year-round operation in all Arctic ice-covered waters</td>
</tr>
<tr>
<td>PC 2</td>
<td>Year-round operation in moderate multi-year ice conditions</td>
</tr>
<tr>
<td>PC 3</td>
<td>Year-round operation in second-year ice which may include multi-year ice inclusions</td>
</tr>
<tr>
<td>PC 4</td>
<td>Year-round operation in thick first-year ice which may include old ice inclusions</td>
</tr>
<tr>
<td>PC 5</td>
<td>Year-round operation in medium first-year ice which may include old ice inclusions</td>
</tr>
<tr>
<td>PC 6</td>
<td>Summer/autumn operation in medium first-year ice which may include old ice inclusions</td>
</tr>
<tr>
<td>PC 7</td>
<td>Summer/autumn operation in thin first-year ice with which may include old ice inclusions</td>
</tr>
</tbody>
</table>

### Finnish/Swedish (Baltic) Class

<table>
<thead>
<tr>
<th>Finnish/Swedish (Baltic) Class*</th>
<th>ASPPR Class</th>
<th>Russian Register Class</th>
<th>Polar Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA Super</td>
<td>Type A</td>
<td>UL</td>
<td>PC 6</td>
</tr>
<tr>
<td>IA</td>
<td>Type B</td>
<td>L1</td>
<td>PC 7</td>
</tr>
</tbody>
</table>
Extent of Coverage with Polar Icebreaker vs. Canadian EEZ

Source: Durham University - International Boundaries Research Unit
## Polar Icebreaker

<table>
<thead>
<tr>
<th>MILESTONE</th>
<th>TARGET</th>
<th>ACHIEVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Project Approval</td>
<td>Sep 2009</td>
<td>Jun 2009</td>
</tr>
<tr>
<td>Develop Vessel Essential Operational Requirements</td>
<td>Jan 2010</td>
<td>Feb 2010</td>
</tr>
<tr>
<td>Issue Letter of Interest for the Design Stage</td>
<td>Jun 2010</td>
<td>Jul 2010</td>
</tr>
<tr>
<td>Polar Icebreaker Industry Day</td>
<td>Oct 2010</td>
<td>Oct 2010</td>
</tr>
<tr>
<td>Complete Conceptual Design Work</td>
<td>Jan 2011</td>
<td>Feb 2011</td>
</tr>
<tr>
<td>Contract Award for the Detailed Design Services</td>
<td>Nov 2011</td>
<td>Nov 2011</td>
</tr>
<tr>
<td>Completion of Design/ Delivery of Construction Specification</td>
<td>October 2013</td>
<td>--</td>
</tr>
<tr>
<td>Effective Project Approval</td>
<td>Fall 2013</td>
<td>--</td>
</tr>
<tr>
<td>Award Construction Contract</td>
<td>Spring 2014</td>
<td>--</td>
</tr>
<tr>
<td>Production Engineering and Materials Procurement</td>
<td>Spring 2014 – Fall 2017</td>
<td>--</td>
</tr>
<tr>
<td>Vessel Construction</td>
<td>Fall 2015 – Summer 2017</td>
<td>--</td>
</tr>
<tr>
<td>STW, Harbour Trials, Sea Trials and Provisional Acceptance</td>
<td>Fall 2017</td>
<td>--</td>
</tr>
<tr>
<td>Vessel Delivery</td>
<td>Fall 2017</td>
<td></td>
</tr>
<tr>
<td>Performance Trials and Final Acceptance</td>
<td>Winter 2018</td>
<td>--</td>
</tr>
<tr>
<td>End of Warranty Period</td>
<td>Spring 2019</td>
<td>--</td>
</tr>
<tr>
<td>Project Closure</td>
<td>2019</td>
<td>--</td>
</tr>
</tbody>
</table>
MSPV
Mid-shore Patrol Vessel
Mid-Shore Patrol Vessel (MSPV)

Medium sized vessel primarily used for maritime security and fisheries enforcement
Mid-Shore Patrol Vessel (MSPV)

- NOT part of NSPS -- ongoing @ ISI until 2014
- Maritime Security (Great Lakes & St Lawrence):
  - joint CCG-RCMP Marine Security Enforcement Team
  - Enhance national security
  - Respond to potential threats
  - Safeguard “Federal” on-water enforcement
- Compliance & Enforcement (Atlantic & Pacific)
  - Support Dept of Fisheries & Oceans at sea
  - Conduct surveillance of & enforce fisheries operations
  - Monitor & patrol the oceans (coastlines / boundaries)
  - Discourage smuggling and fish poaching

### Vessel Particulars

<table>
<thead>
<tr>
<th>L / B / T</th>
<th>43.0 / 7.0 / 2.85 [meters]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>257 [tonnes]</td>
</tr>
<tr>
<td>Speed (Max/Cruise)</td>
<td>25 / 14 [kts]</td>
</tr>
<tr>
<td>Range</td>
<td>2000 [NM] @ 14 kts</td>
</tr>
<tr>
<td>Propulsion</td>
<td>2 CPP, 4992 [kW]</td>
</tr>
<tr>
<td>Construction</td>
<td>Steel Hull + AL Deckhouse</td>
</tr>
<tr>
<td>Crew (9 core+5 supp)</td>
<td>14 (CCG+RCMP+DFO)</td>
</tr>
</tbody>
</table>

### Build intent - East

Project Status

- July 2009: Contract awarded (ISI)
- Fall 2009: Preliminary Design Review
- Spring 2010: Final Design Review
- Fall 2010: Steel Cutting
- July 2012: 1st MSPV delivery
- Late 2014: Final MSPV delivery
### MSPV Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>43 m</td>
</tr>
<tr>
<td>Beam</td>
<td>7.0 m</td>
</tr>
<tr>
<td>Draft</td>
<td>2.85 m</td>
</tr>
<tr>
<td>Displacement</td>
<td>257 tonnes</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>25 kt</td>
</tr>
<tr>
<td>Cruising Speed</td>
<td>14 kt</td>
</tr>
<tr>
<td>Endurance</td>
<td>14 days</td>
</tr>
<tr>
<td>Range</td>
<td>2000 nm @ 14kts</td>
</tr>
<tr>
<td>Propellers</td>
<td>2 controllable pitch propellers</td>
</tr>
<tr>
<td>Power</td>
<td>4930kW</td>
</tr>
<tr>
<td>Rigid Hull Inflatable Boats</td>
<td>1 x 7.53m for Fisheries Enforcement variant and 2 x 7.53m for Maritime Security variant</td>
</tr>
<tr>
<td>Crew</td>
<td>14 people (9 CCG, 5 Fisheries Officers/RCMP)</td>
</tr>
</tbody>
</table>
**MSPV vs. Sentinel**

**CCGS Private Robertson V.C.**  
(Damen 4207)  
- 43 metres  
- 257 tonnes  
- Endurance – 14 days, 2000 NM  
- MTU 12V 4000 M93L  
- Speed – 25 knots  
- Complement – 14 personnel  
- Cost – $22M (CAD) per vessel

**USCGC Bernard C. Webber**  
(Damen 4708)  
- 47 metres  
- 349 tonnes  
- Endurance – 5 days, 2500 NM  
- MTU 20V 4000 M93L  
- Speed – 28 knots  
- Complement – 22 personnel  
- Cost - $44M (USD) per vessel
Irving Shipbuilding Inc

1. Burning Shop (DNC underwater oxygen plasma & oxy-acetylene machines)
2. Plate Shop (183m x 23m x 12m, complete with panel line & shell jigs)
3. Outfit Steel Shop
4. Module Shop (162m x 30m x 22m, 90t lift & heavy load transfer system)
5. Turntable
6. Launchway (max length about 150m, with 65t berth crane)
7. Pipe Shop (500m2)
8. Sheet Metal Shop, QA, Test & Trials
9. Ship Repair Offices & Owner’s Reps
10. Machine Shop (full range of machine tools)
11. Machine Shop Wharf (100m, with about 9.1m water depth)
12. Pier 6&7 (338m, with about 8m water depth)
13. Graving Dock (173m x 23.5m, 8m over the sill)
14. Scotia Dock II (with 25,400t lift, 183m long x 31.5m open width x 8m over the blocks. Wingwall cranes 15t)
15. Nova Dock (Panamax dock with 36,000t lift, 257m long, x 38m open width x 9m over the blocks. Two 40t wingwall cranes)
16. Warehouse (1,700m2, computer-controlled)
17. Steelyard
18. Main Offices (Management, Estimating, Engineering, Video-Conference facilities)
19. Client Facilities & Security
20. Warehouse & Joiner Shop

HALIFAX SHipyard
Facilities
Seaspan Shipyards
Ensuing Shipbuilding Contracts

- Contracts for shipbuilding projects **will be:**
  - Negotiated as per UAs
  - **Subject to separate Government approval**
  - Used by selected shipyards to deliver:
    - value proposition commitments
    - productivity improvement
Cutter Capital Asset Management Plan
COMDTINST 4700.1

751 WORLD OF WORK

New Assets – “POR”
NSC (8)
OPC (25)
FRC (58)
Ice Breaker (1)

Midlife
225’ WLB (16)
87’ CPB (73)
420’ WAGB
175’ WLM (14)

Design Service Life
270’ WMEC (13)
295’ WIX
282’ WMEC
210’ WMEC (14)
140’ WTGB (9)
75'/100'/160’ WLIC (13)

Useful Life
399’ WAGB (2)
378’ WHEC (7)^2
110’ WPB (40)^1
100’ WLI (2)
65’ WYTL (11)

Total of 92 Cutters
Total of 104 Cutters
Total of 71 Cutters
Total of 62 Cutters

Total Management
333 Cutters
8,441 Personnel

Disposition
Inactive (1)^1
DECOM (1)^2
FMS (2)

Total of 4 Cutters