National Network for Shipbuilding/Marine Research and Training – iSMART UBC Workshop

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Outline

- Overview of Shipbuilding in Canada
- Overview of the Fleet / Roles
- Overview of the RCN's needs in its workforce
- How can universities supplement the RCN's own efforts in the development of these skills
- Thoughts on the structure of the National Network

A Strong Background

- New France
  - The first sailing ships launched at PORT-ROYAL, Acadia, in 1606
  - In 1732 a shipyard was established on Rivère St-Charles (Québec)
  - The 10 merchant vessels built there that year may be termed the true start of the industry as a commercial enterprise in Canada
  - Warships were also ordered for the French navy, including a ship-of-the-line mounting 70 guns built in 1750
- Great Lakes
  - In 1677-78 a single-decked barque of 10 tons, and 3 other vessels built on Lake Ontario
  - In 1679, the GRIFFON, 20 m 60 tons was built on the Niagara River
  - 1732 -1745 a number of vessels built, 6 for Lake Ontario and one for Lake Superior
  - The WAR OF 1812 generated a flurry of shipbuilding. The ST LAWRENCE, built in Kingston in 1814, was a 3-decker mounting 102 guns, and was larger than Nelson's Victory
- Pre-WWI
  - The heyday of Canadian shipbuilding was in the years 1840 to the early 1880s, when wooden sailing ships ruled the waves
  - In the peak shipbuilding years during the 1870s Canada produced 500 to 600 vessels per year, making her the fourth largest producer of ships in the world

WW I, interwar, and WW II Ship Projects

Project		Time-frame	Shipyard(s)
Submarines	Assembled for RN (10)	Early 1915	Canadian Vickers
Trawlers	Battle Class (12)	Jun – Sep 1917	Various
Minesweepers	Fundy Class (4)	1938	Collingwood Shipyards Ltd Burrard Dry Dock Co. Ltd, Vancouver Morton Engineering and Dry Dock Co, Québec Yarrows Ltd, Esquimalt
Corvettes	Flower Class (64)	1940-41	Great Lakes, Up. St. Lawrence & BC
Minesweepers	Bangor Class (24)	1940-41	Great Lakes, Up. St. Lawrence & BC
Corvettes	Flower Class (6)	1940-41	Great Lakes, Up. St. Lawrence & BC
Minesweepers	Bangor Class (10)	1940-41	Great Lakes, Up. St. Lawrence & BC
Destroyers	Tribal Class (8)	1940-48	Halifax Shipyards Ltd (4)
Corvettes	Flower Class Mod (36)	1942-43	Great Lakes, Up. St. Lawrence & BC
Frigates	River Class (45) (Plus Ships for Export)	1941-44	Canadian Vickers, Montreal Davie Shipbuilding & Repair, Lauzon Morton Engineering and Dry Dock Co, Québec Yarrows Ltd, Esquimalt
Minesweepers	Algerine Class (12)	1942-44	Port Arthur Shipbuilding Company Ltd

Cold War Ship Projects

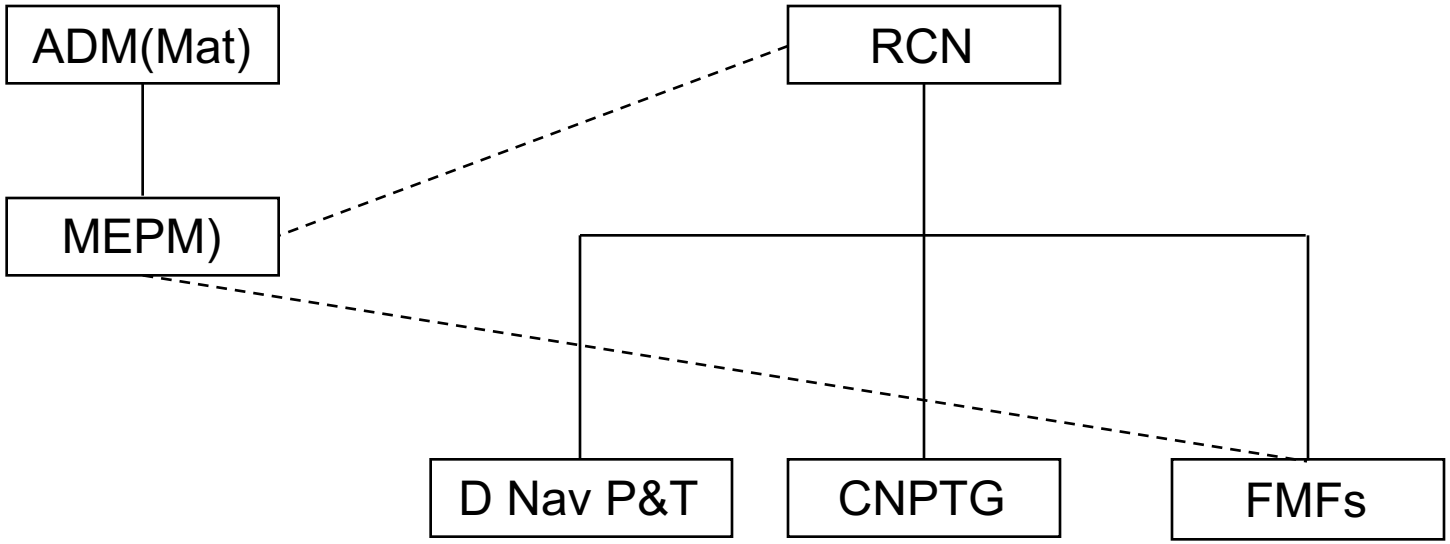
Project		Time-frame	Shipyard(s)
Destroyer Escorts	St. Laurent Class (7)	1950-1957	Halifax Shipyard (4) Davie Shipbuilding (2) MIL (Sorel) (3) Canadian Vickers (4) Burrard Drydock (4) Victoria Machinery Depot (2) Yarrows (1)
	Restigouche Class (7)	1953-1959	
	Mackenzie Class (4)	1958-1963	
	Annapolis Class (2)	1960-1964	
Minesweepers	Bay Class (20)[1]	1951-1957	Davie Shipbuilding (5) MIL (Sorel) (2) Kingston Shipbuilding (1) Canadian Vickers (1) Victoria Machinery Depot (4) Yarrows (2) St. John Shipbuilding (2) Port Arthur Shipbuilding (3)
Auxiliary Oiler Replenishment	Provider Class (1)	1958-1963	Davie Shipbuilding
Hydrofoil	HMCS Bras d'Or (1)	1960-1968	MIL (Sorel)
Auxiliary Oiler Replenishment	Protecteur Class (2)	1966-1969	St. John Shipbuilding
Destroyers	Iroquois Class (4)	1969-1973	Davie Shipbuilding (2) MIL (Sorel) (2)

[1]Six were transferred to the French Navy in 1954. These ships were replaced by six of the same name in 1956-1957.

Note: Other projects included the hydrofoil Bras d'Or and Icebreaker Labrador.

The Royal Canadian Navy Fleet

RCN and ADM(Mat) Responsibilities for the Technical Establishment



Challenging Mission

To Deliver Safe and Capable Fleets Today and Tomorrow

The Program must oversee the delivery and support of naval materiel that is fit-for-purpose, meets or exceeds environmental performance requirements, is safe and is operated safely

- **Maintaining current fleets ensuring operational availability, performance and safety**
- **Large Scale new construction programs**
    - **Significant Opportunities for careers in Naval Architecture as well as other technology and engineering backgrounds**

High Human Resource Demand

- All Naval Technician occupations short of qualified personnel
- Intake plan for both Naval Technical Officer (Marine and Combat Systems) occupations high (BEng / Technologist Requirement)
- High demand for Graduate and Post-Graduate Qualifications
- Long training requirements and high retirement rates challenging

NTO Strategic Intake Plan (SIP) 16/17

- MS ENG (36)
  - **DEO (6) Direct Entry Officer, already has acceptable degree**
  - ROTP (20) Receiving degree from Royal Military College
  - SCP (1) No degree, commissioned for a specific job, no advancement
  - CFR (3) No degree, commissioned based on experience
  - SRCP (1) No degree, commissioned for a specific job, no advancement
  - UTPNCM (2) Receiving degree after commissioning, typically at RMC
  - In-Svc (3) Occupational Transfer, already has acceptable degree
- Preferred entry plan for all CAF officers is ROTP

NTO Strategic Intake Plan (SIP) 16/17

- NCS ENG (45)
  - Re-entry, trained (1) Back into the occupation after releasing
  - **DEO (9) Direct Entry Officer, already has acceptable degree**
  - ROTP (25) Receiving degree from Royal Military College
  - SCP (1) No degree, commissioned for a specific job, no advancement
  - CFR (2) No degree, commissioned based on experience
  - SRCP (1) No degree, commissioned for a specific job, no advancement
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Non Commissioned Members

- Complexity of technical occupations increasing
- College based backgrounds
  - Communications
  - Electronics
  - Complex Machinery
  - Computers
  - Etc.
- Increased partnerships between colleges and universities

Officer Graduate and Post-Graduate

55 LCdr/Lt(N) positions with advanced degree requirements

- Combat Systems Engineering
- Master of Engineering (Electrical)
- Marine Systems (Control and Instrumentation Engineering)
- Environmental Engineering
- Marine Engineering
- Radar System Design
- Industrial Engineering
- Reliability, Maintainability and Systems Analysis
- Underwater Acoustics
- Mechanical Engineering
- Nuclear Engineering
- Guided Weapons Systems

Officer Graduate and Post-Graduate (continued)

- ADP Management Information
- Electrical Engineering - Communications
- Masters of Business Administration
- Advanced Ammunition Engineering
- Computer Software Management
- Naval Architecture
- Master of Engineering (Fire Safety)
- Computer Network Security

Role for Civilian Universities

- Initial Training of DEO Officers
- Some ROTP Officers
- Specialized Graduate Training
- Tailored Training / Partnerships
  - Naval Weapons & Marine Engineering Technicians - Marine Institute, Memorial University
  - Project Managers – Masters in Complex Project and Procurement Leadership, Telfer School of Management, University of Ottawa
- Contribution to developing a pool of sustainable skills in Canada

National Network

- Regular Stakeholder Engagement
  - Includes Deans of Engineering and Technologist Programs
- Mix of Government, Industry and Educational Organizations
- Collaborative Approach to Leverage End User Needs
- Need to develop a qualified, competent & skilled professional shipbuilding sector in Canada – will take all of us