



**Marine Education and Training –
Design/Engineering Company Perspective**

CISMART, Ottawa, July 2017

Andrew Kendrick, Vice President Operations, Ottawa



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Scope

Introduction to Vard Marine

Canadian Marine Education:

- Strengths and Weaknesses
- Current and Future Needs
- Industry Roles



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Vard Marine Inc.

Naval architecture and marine engineering
 company established in July 1983.

Subsidiary of VARD Group AS in Norway.

Majority owned by Fincantieri of Italy



Vancouver, BC



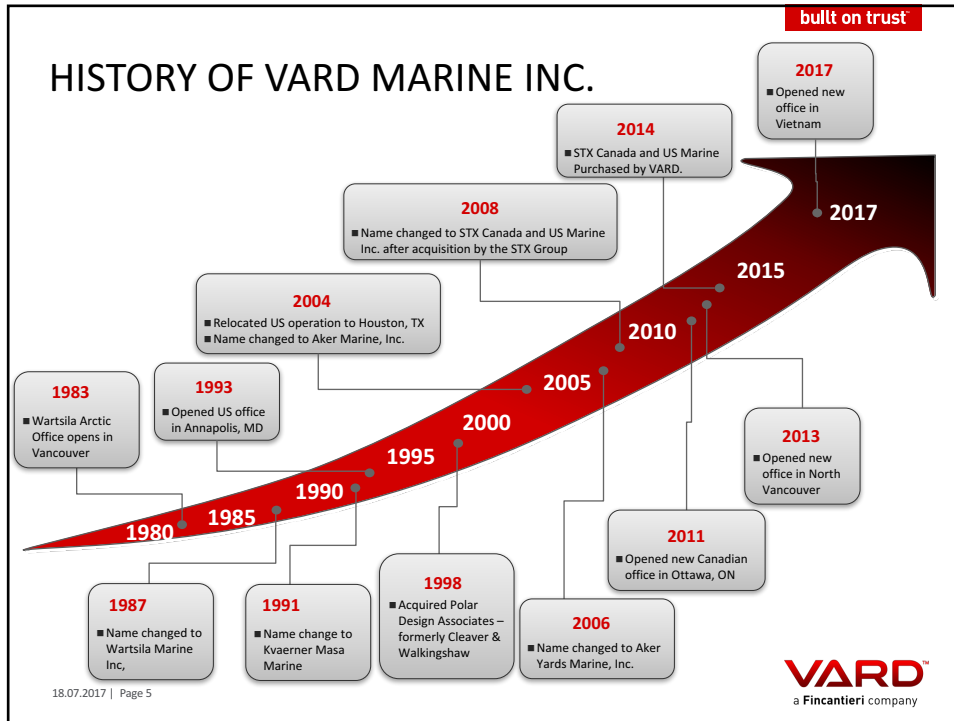
Houston, TX



Ottawa, ON









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Product Range: Offshore Vessels – Conventional and Unconventional

		
Bravante Group	Seacor Marine	CSS - Accommodation
		
Laborde Offshore	Harvey Gulf International Marine	CSS - Maintenance
		
Harvey Gulf International Marine	Harvey Gulf International Marine	CSS – Well Intervention

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Ferries



BCFS Spirit Class



BCFS Queen of Capilano



Seaspan Trailer Ferries



STQ LNG Ferries



Gran Manan Adventure

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Government Ships



USCGC OPC



OFSV



HMNZS Wellington



Irish OPV - LE Samuel Beckett



HMS Echo



CCGS Leonard J. Cowley

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National Shipbuilding Procurement Strategy

Combat Ship Contract
Irving Shipbuilding
Halifax Shipyard



AOPS – Vard Marine Design



CSC – Potential Canadian Platform Design Partner

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Non-Combat Ship Contract
Seaspan
Vancouver Shipyard



OFSV– Vard Marine Functional Design



OOSV– Vard Marine Design



JSS– Vard Marine Functional Structure and Mechanical Design



Polar Icebreaker – Vard Marine Design

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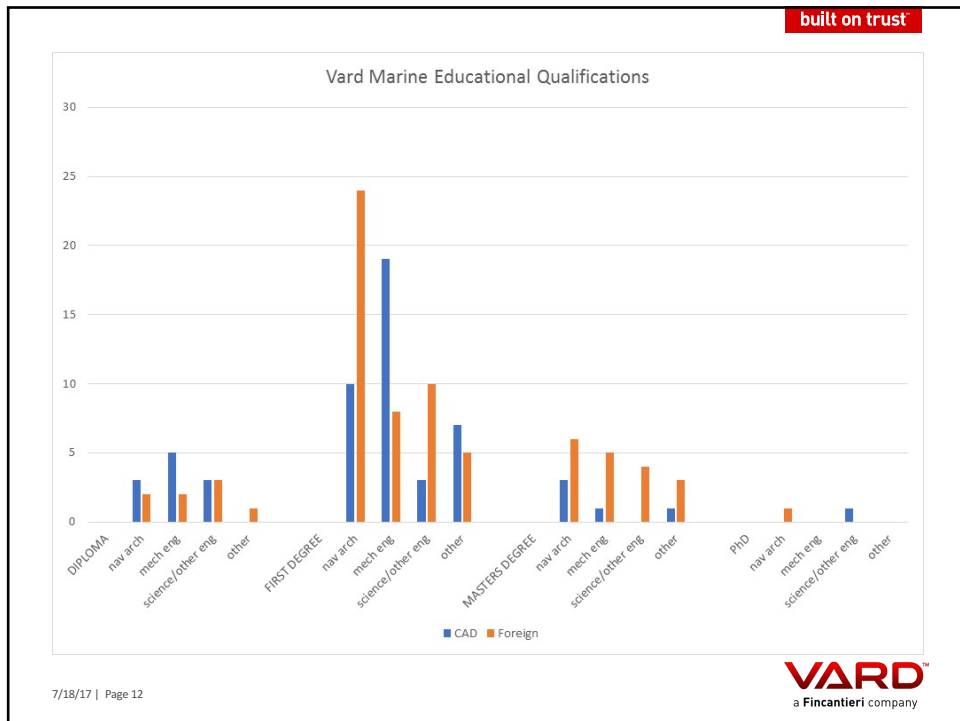
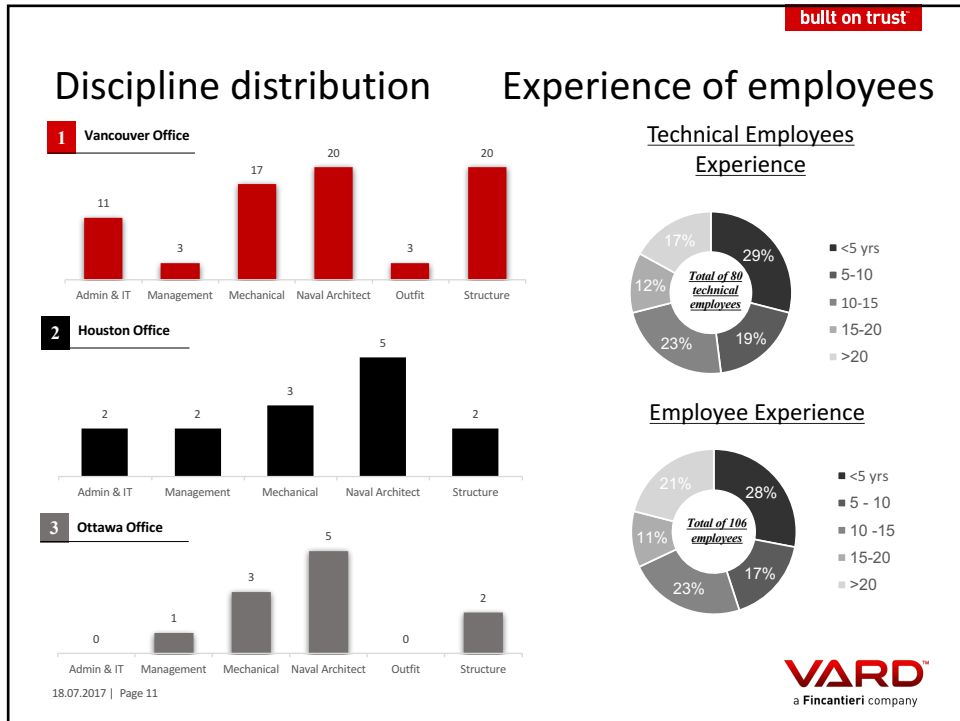
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VARD Roles in NSS

	Design	OFSV	OOSV	JSS	Polar IB	AOPS
	Concept		X		X	X
	Preliminary	X	X		X	X
	Functional	X	X	X	x	
	Detailed	X	X	X	x	
WBS	Discipline					
0	General	X	X	X	X	X
100	Structures	X	X	X	X	X
200	Propulsion	X	X		X	X
300	Electrical			X	sub	sub
400	C4I					sub
500	Auxiliaries	X	X	X	X	X
600	Outfit	X	X	X	X	X
700	Combat Sys					sub

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Canadian Marine Education – Strengths and Weaknesses

Naval Architecture

- Strengths
 - Basic Naval Architecture – students have good grounding in many disciplines
 - Co-op programs provide real-world experience
 - (sometimes) design projects and work experience give insights into design processes
- Weaknesses
 - (often) poor writing skills
 - Advanced degrees are too focused – loss of context

Strengths and Weaknesses

Marine Engineering

- Strengths
 - Good grounding in fundamentals in some Mech. Eng. programs
 - Some innovative programs in Canadian universities
- Weaknesses
 - Little that is marine specific
 - Too few programs
 - Interested mech. Engineers often transfer into nav. arch.
 - Very limited electrical engineering training

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Industry Requirements: PC+

- Productivity
 - Knowledge of techniques and tools
 - Self-checking skills
 - Work ethic
- Creativity
 - Look beyond rules and requirements
 - Think how to apply new resources
 - Understand how to research
- Connectivity
 - Effective communication – verbal, written, electronic
 - Teamwork skills
 - Network skills

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Industry Roles

- Current
 - Intern/co-op opportunities
 - Guest lectures
 - Support to design projects
 - Advice to faculties
 - Collaborative/contract research
- Future (?)
 - Support for tailored short courses
 - More of the above

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Barriers and Challenges

- Timeframes
 - NSERC/ISED procedures are too slow for many R&D opportunities
 - Rigid schedules don't mesh with commercial realities
- Government policies
 - No real understanding of importance of design
 - VP/ITB don't promote education and training
- Industry fragmentation
 - "clusters" not really part of Canadian marine industry
 - Very limited domestic supply chain – sales not development