

The NSPS Shipbuilding Value Chains

A photograph of a ship on the ocean under a cloudy sky. The ship is a large vessel, possibly a cargo ship or a fishing vessel, with a dark hull and a white superstructure. It is positioned in the middle ground, slightly to the left of the center. The ocean is a mix of dark and light patches, suggesting shallow water or sandbars. The sky is filled with heavy, grey clouds, with a hint of light breaking through near the horizon.

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Center on Globalization, Governance & Competitiveness

Duke University

January 24, 2013

dedicated to
**INNOVATIVE and
INTERDISCIPLINARY**
research

- 1 Global Value Chains & Development 
- 2 Environment
- 3 Agriculture, Food & Health
- 4 NC in the Global Economy 
- 5 Global Engineering & Entrepreneurship 
- 6 Nanotechnology 

CGGC IN THE MEDIA

JULY 26, 2012
Geosynthetics Industry Poised to Grow as Gulf Coast Restoration Ramps Up

JULY 10, 2012
New Tool for Cities Hopping on Bus Rapid Transit

JUNE 11, 2012
RESTORE Act creates jobs along ailing Gulf Coast

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OUR TEAM



[Meet the CGGC Team](#)

RESEARCH REPORTS

Geosynthetics: Coastal Management Applications in the Gulf

At least 84 firms are linked to geosynthetics and coastal management, providing jobs in 36 states.

[View Report](#)  [Interactive Database](#) 



U.S. Bus Rapid Transit

New report and online tools for understanding the Bus Rapid Transit value chain.

[View Report](#)  [Interactive Database](#) 



Restoring Gulf Oyster Reefs: Opportunities for Innovation

Restoration will support 132 innovative small and medium sized businesses across 22 states.

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Accessing Ocean Technology Value Chains: a Guide for the Canadian Trade Commissioner Service

Increasing access of Canada's small and medium-sized enterprises to ocean technology value chains.

[View Report](#) 



HIGHLIGHTS

Our Work at a Glance

Download the **FULL LIST** of 2009-2012 CGGC Reports, Publications and Presentations 

GVC Book Contribution

Global Value Chains in the Postcrisis World: A Development Perspective



CO-EDITED BY GARY GEREFFI

SKILLS FOR UPGRADING: Workforce Development and Global Value Chains in Developing Countries



[View Details](#) [View Book](#) 

Recent Clients



Agenda

Part 1

- Project scope and objectives
- Shipbuilding GVC

Part 2

- Illustration of GVC analysis

Part 3

- Findings & Recommendations

Project Scope

Value chains of:

- Arctic/Offshore Patrol Ships (**AOPS**)
- Polar **Icebreaker** & Science Vessels (**OOSV/OSFV**)
- Joint Support Ships (**JSS**)

Research Objectives

- Discover the **value chain position** of Nova Scotia's companies;
- Identify **innovation and technology trends** in the shipbuilding value chains;
- Make **recommendations** to industry and government about:
 - Regional value chain development activities
 - Supporting Nova Scotia companies
 - Moving into higher value-added activities

Research Questions

Value Chain governance

Who are the main players?

How can Nova Scotia's companies enter the main players' supply chains?

What can government do to better support them?

Regulatory issues

How do public & private regulations affect the value chains?

Innovation

What are the promising technologies in the sector?

How can government foster development of technology?

Regional issues

What opportunities exist for regional cooperation and trade?

Developing advantage for the future

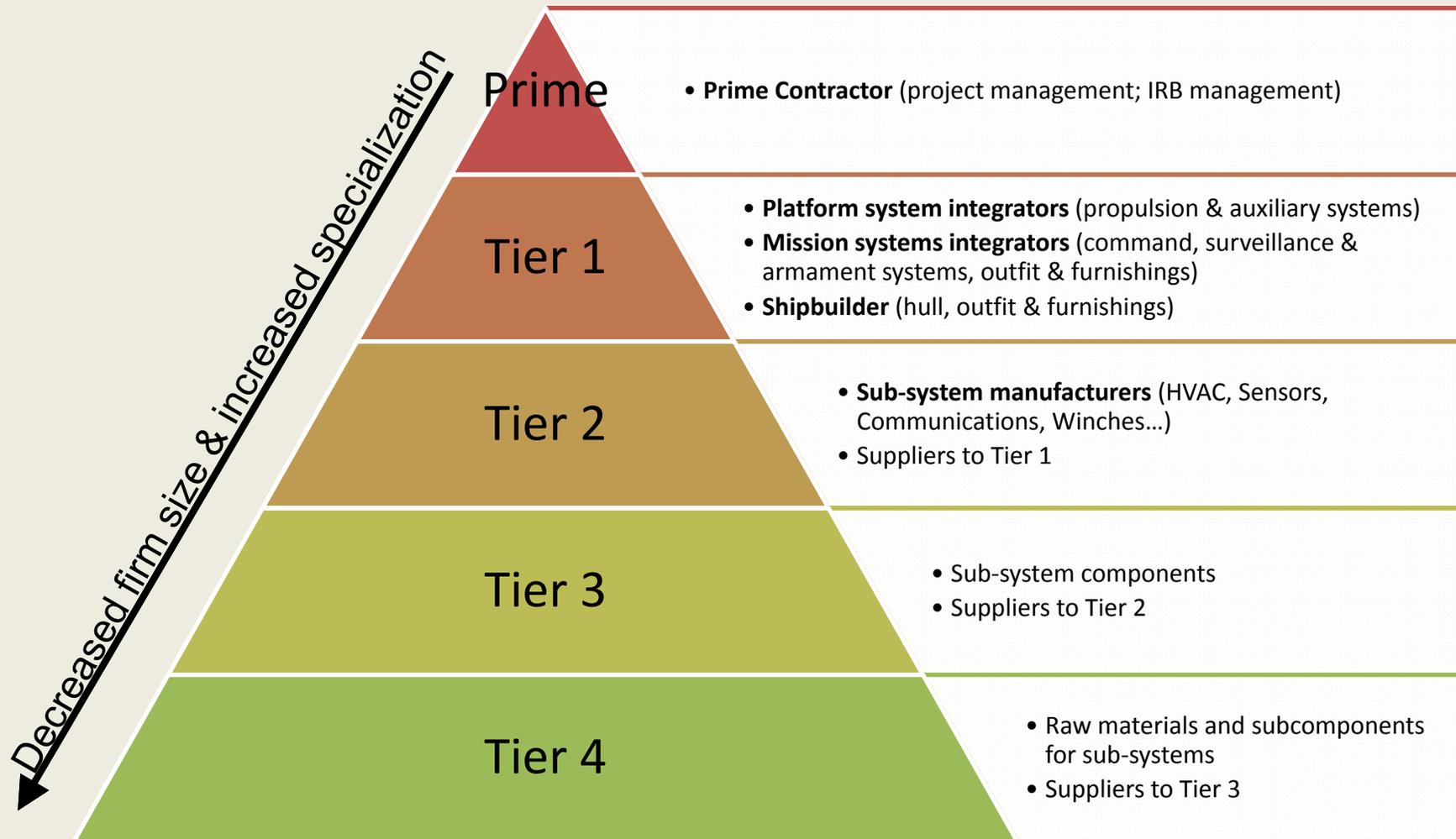
How can NS best position itself for future advantage?

Priority research needs

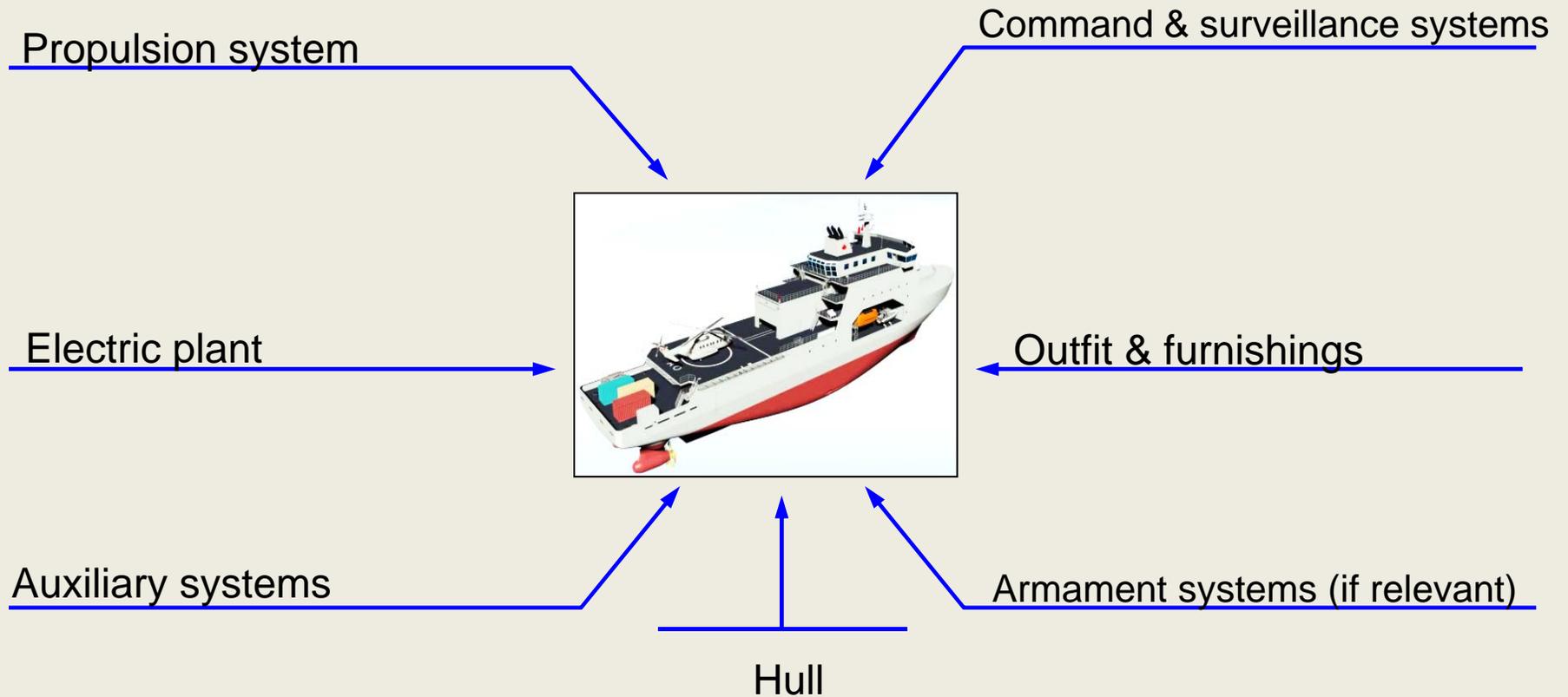
What don't we know that we need to know?

ANALYSIS OF SHIPBUILDING GVC

Shipbuilding Production System



Ship Systems



Ship Systems & Subsystems

Propulsion system

- | | |
|------------------|-------------------|
| • Engine | • Thrust block |
| • Generator | • Propeller shaft |
| • Control unit | • Propeller |
| • Electric motor | |

Command & surveillance systems

- | | |
|--|--|
| • Command system | • Electromagnetic environmental effects (E3) & radiation control |
| • Integrated Platform Management System (IPMS) | • Meteorological & oceanographic system |
| • Navigation system | • Surveillance systems |
| • Communication systems | |

Electric plant

- | |
|--|
| • Electric power generation and distribution |
| • Lighting systems |



Outfit & furnishings

- | | |
|------------------|-----------------------------|
| • Ship fittings | • Hull compartments |
| • Deck machinery | • Preservatives & coverings |
| • Living spaces | |

Auxiliary systems

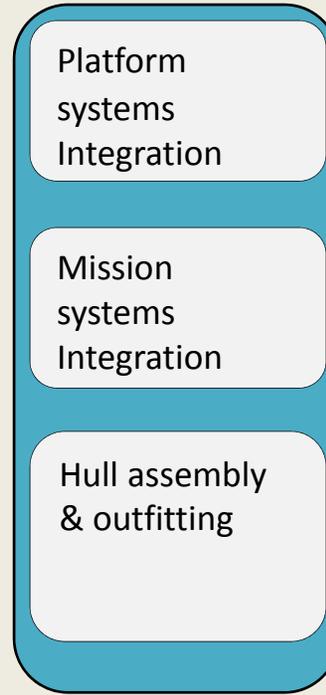
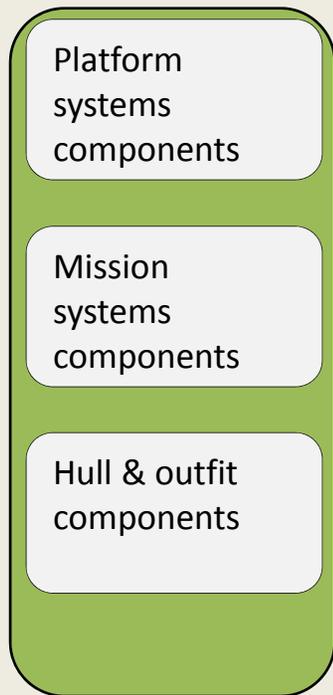
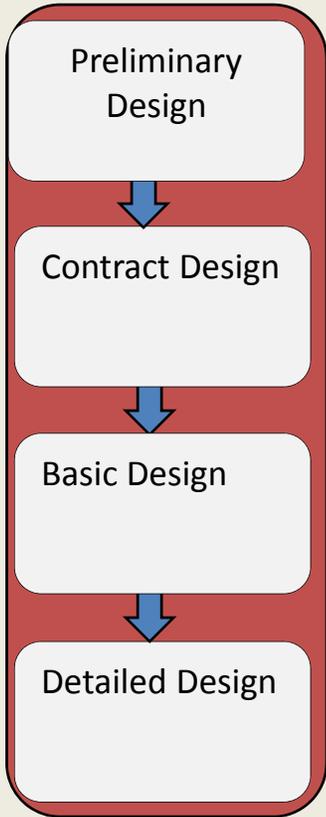
- | | |
|---|---|
| • Ship steering system | • Berthing, mooring & towing systems |
| • Climate control, fire extinguishing & water systems | • Fluid, fuels handling & storage |
| • Anchor handling & stowage systems | • Auxiliary boats & stowage system |
| • Replenishment-at-sea | • Aircraft handling, servicing & stowage |
| | • Environmental pollution control systems |

Armament systems (if relevant)

- | |
|--|
| • Weapon systems |
| • Small arms & ammunition stowage/handling |

Hull

- | |
|-------------------------|
| • Steel plates ("skin") |
| • Keel |
| • Girders |
| • Frames |
| • Beams |



Materials Planning & Procurement

Production Support Services

Production Planning & Engineering

Supporting Institutions

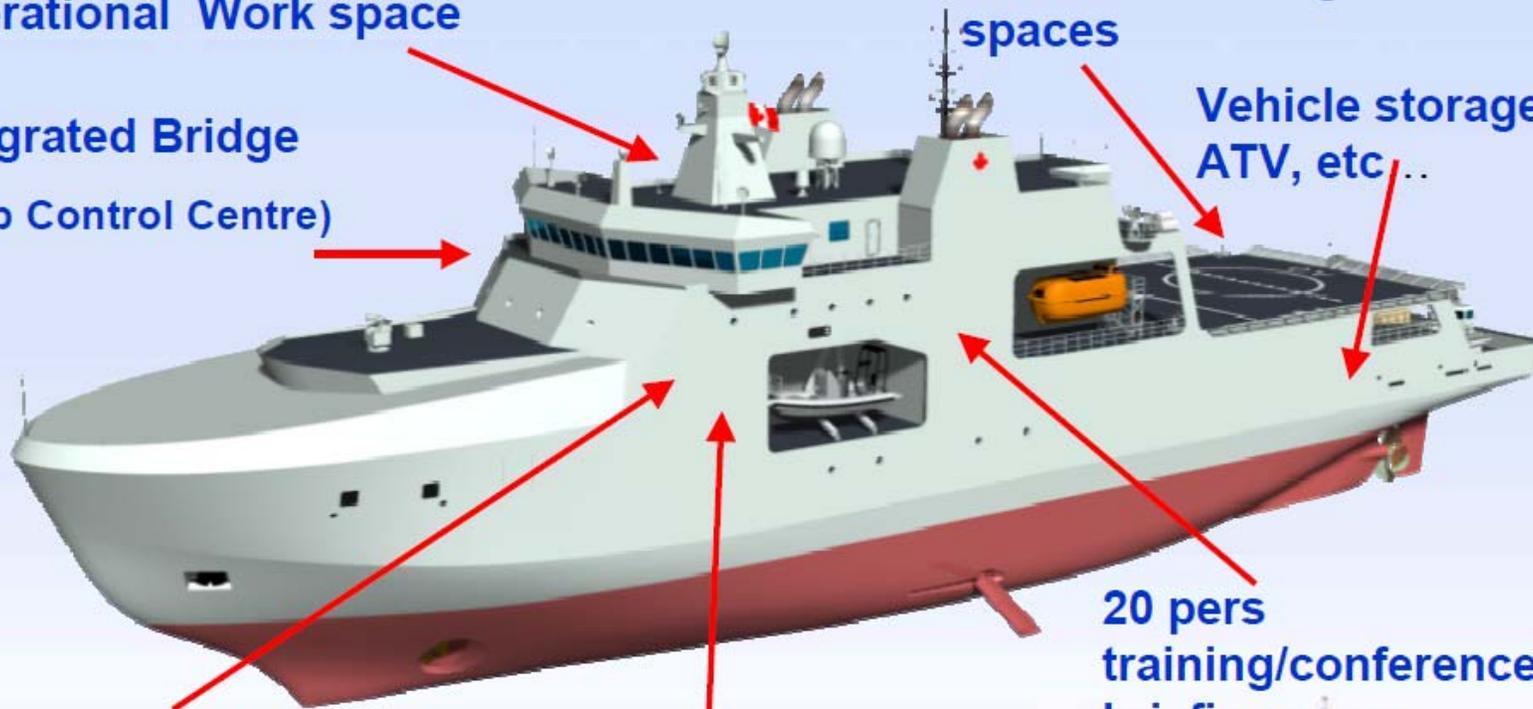


~10 pers Multi Purpose ops space –serves as Ship's Operational Work space

Integrated Bridge (Ship Control Centre)

20 pers mess deck and land force storage spaces

Vehicle storage – ATV, etc ...

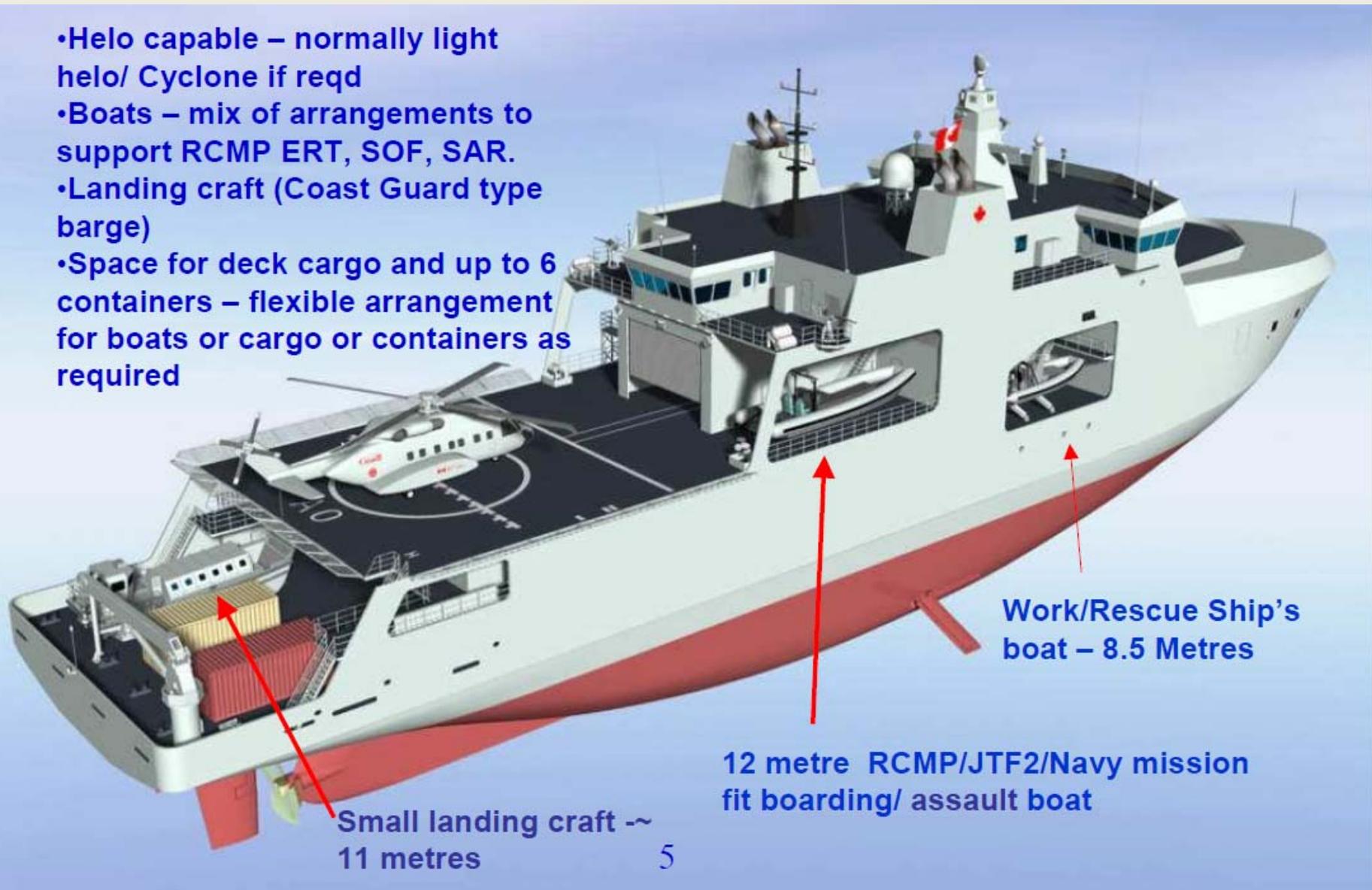


20 man Boarding Party briefing/changing room

6 pers diving locker

20 pers training/conference/air briefing room

- Helo capable – normally light helo/ Cyclone if reqd
- Boats – mix of arrangements to support RCMP ERT, SOF, SAR.
- Landing craft (Coast Guard type barge)
- Space for deck cargo and up to 6 containers – flexible arrangement for boats or cargo or containers as required



Small landing craft ~
11 metres 5

12 metre RCMP/JTF2/Navy mission
fit boarding/ assault boat

Work/Rescue Ship's
boat – 8.5 Metres

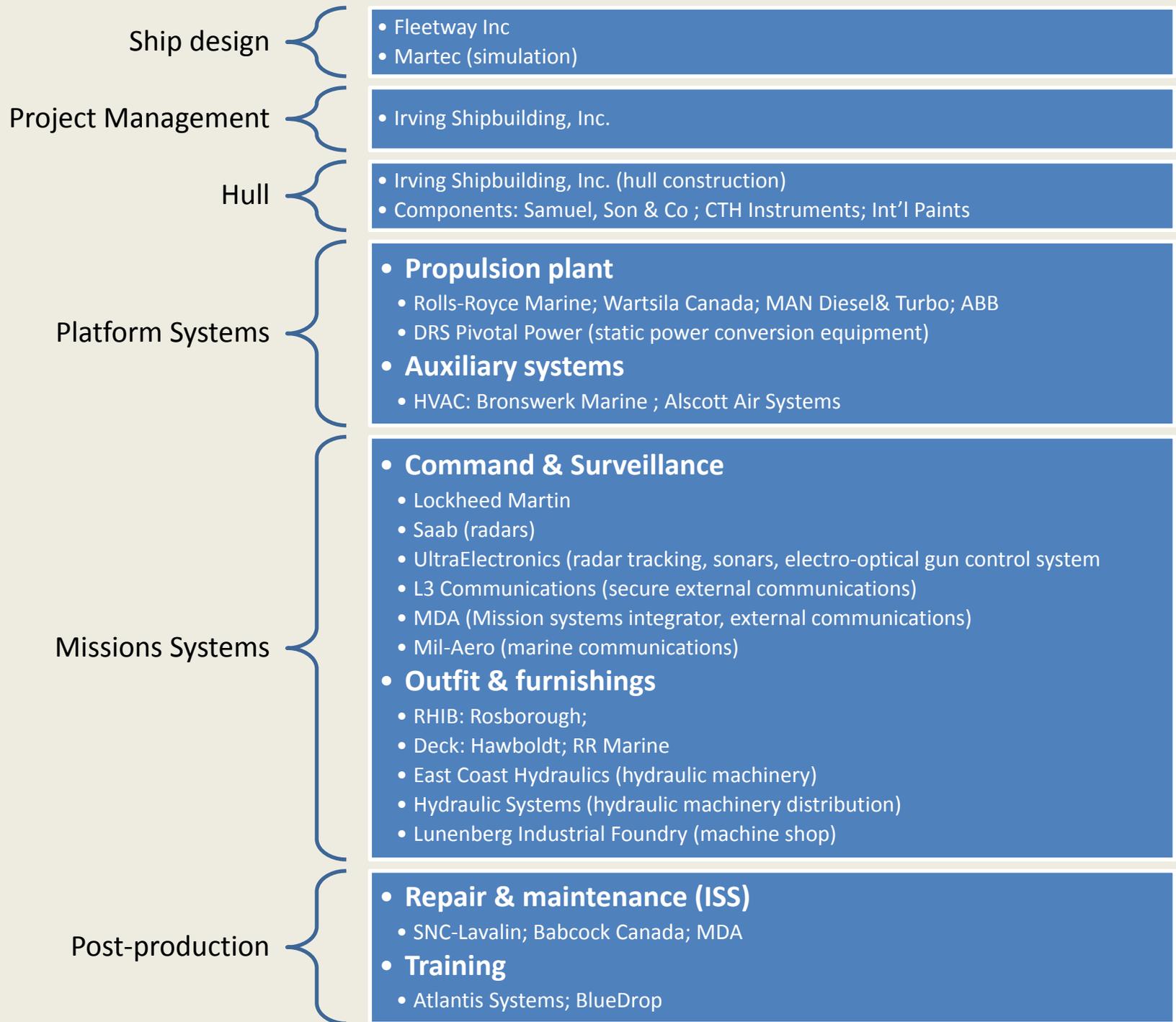
Platform Systems - Hull Components

Steel	
Essar Steel Algoma (ON, Canada)	Steel
Gerdau Amersteel Corporation (ON,Canada)	Steel
Industeel (Belgium)	High Strength/High Tensile Steel (EH 50 or higher)
JFE Steel Corporation (Japan)	High Strength/High Tensile Steel (EH 50 or higher)
Kobe Steel Co (Japan)	High Strength/High Tensile Steel (EH 50 or higher)
Nippon Steel Co (Japan)	High Strength/High Tensile Steel (EH 50 or higher)
SSAB EMEA AB (Sweden)	High Strength/High Tensile Steel (EH 50 or higher)

Coating
AkzoNobel/International Paint (U.K.; Canada)
Chugoku Marine Paints Ltd. (Japan)
Jotun Paints Ltd. (U.K)
PPG Coatings SPRL/BVBA (Belgium)
Sigma Samsung Coatings (Korea)
Subsea Industries NV (Belgium)

Propulsion System
ABB (Switzerland, U.S.A.)
G.E. (U.S.A.)
MAN Diesel and Turbo (Germany)
Rolls Royce (U.K.,U.S.A.)
Wartsila (Finland)

Illustration purposes only



Design Trends

- Multifunctional and modular design
- Systems integration
- Signature reduction
- Fuel economy and ballast water management
- Unmanned vehicles

Opportunities for Nova Scotia

- *Direct sales*
- *Access the multinational firms' supply chains*
- *Upgrading skills and technology*
- *Develop niche areas in the shipbuilding value chain*

FINDINGS & RECOMMENDATIONS

Topic Areas

1. Supporting NS Companies

2. Moving into higher value activities

3. Regional Value Chain development activities

Supporting NS Companies

1.1. Connect with key players in the value chain

Finding	Recommendation
<ul style="list-style-type: none">• Value chain governed by shipyard, systems integrators and top-tier suppliers• Relationship with suppliers based on prospect for joint gains, meeting formal requirements, and network participation.	<ul style="list-style-type: none">• Recommendations to companies<ul style="list-style-type: none">– Participate– Communicate– Maintain– Register– Monitor• Recommendations to government<ul style="list-style-type: none">– Know– Facilitate– Attend– Communicate

1.2 Help SMEs overcome barriers to entry in the shipbuilding value chain

Finding	Recommendation
<p>SME's face four kinds of barriers to enter the shipbuilding value chain.</p> <ul style="list-style-type: none">• Information gaps• Network gaps• Certification gaps• Coordination gaps	<p>Close information gaps:</p> <ul style="list-style-type: none">• recognize and incorporate resource and capacity constraints in program design <p>Close network gaps:</p> <ul style="list-style-type: none">• Foster linkages (facilitation meetings) <p>Close certification gaps:</p> <ul style="list-style-type: none">• identify needs and gaps in entrepreneurship & small business assistance programs in province, especially in rural areas and First Nation communities. <p>Close coordination gaps:</p> <ul style="list-style-type: none">• Evaluate feasibility of small business alliance(s) to offer system solutions to higher tier companies

1.3.1 Inform value chain actors about the effect of public regulations on the value chain

Finding	Recommendation
<ul style="list-style-type: none">• IRB is a policy with a major effect on the conduct of the supply chain for NSPS vessels<ul style="list-style-type: none">• IRB is a fluid policy• IRB has many subcomponents that are not well or widely understood by industry• Value proposition and the IRB are separate components of the NSPS procurement process• Controlled Goods program is a significant regulatory barrier companies must satisfy to participate in the value chain	<p>Provide information about IRB on a publicly available website and advertise existence of website</p> <ul style="list-style-type: none">• Clarify basic goal and need for policy• Clarify difference between direct and indirect offsets.• Clarify the role of Industry Canada• Clarify difference between IRB and Value Proposition <p>Compile an easy reference source for the Controlled Goods program. Place on website and communicate to companies about its existence.</p>

1.3.2 Inform value chain actors about the effect of private regulations on the value chain

Finding	Recommendation
<p>Private regulations affect whether companies can participate in the supply chains of higher tier companies.</p>	<ul style="list-style-type: none">• Compile an easy reference source for common requirements placed on suppliers.• Place on website and communicate to companies about its existence.

Supplier Standards

- What do shipyards and systems integrators look for in potential suppliers?
 - Ability to meet technical specifications
 - ISO 9001:2008 Quality Management
 - Controlled Goods Program / ITAR
 - Price competitiveness
 - Ability to help offset IRBs
 - Management capability
 - Patent experience
 - Capability Maturity Model Integration (CMMI)
 - ISO 14000 Environmental Management

1.4 Communication about NSPS and relevant policies to companies and citizens

Finding	Recommendation
<p>Confusion exists about the status of the NSPS Shipbuilding process, particularly:</p> <ul style="list-style-type: none">• Time horizon and decision-making for different vessels• Difference between production and in-service support contracts• How access to the shipbuilding value chain is governed• Opportunities for new business	<ul style="list-style-type: none">• Use existing organizations and established networks to provide information to small business, rural areas, and citizens about status of the NSPS shipbuilding process and relevant policies to access supply chain.• Manage expectations of immediate economic impact by stating, and repeating, long-term nature of the shipbuilding project.
<p>Companies are uncertain which government agency and program to tap for information.</p> <ul style="list-style-type: none">• Confusion exists about the roles of different levels of government in assisting companies, providing information, and their regulatory authority	<ul style="list-style-type: none">• Develop website clearly and authoritatively identifying the responsibility domain of different agencies involved in NSPS at the local, provincial, and federal level.
<p>General confusion exists about the IRB policy</p>	<ul style="list-style-type: none">• Clarify basic goal and need for policy• Clarify difference between direct and indirect offsets.• Clarify the role of Industry Canada• Clarify difference between IRB and Value Proposition• Provide information on a publicly available website and advertise existence of website

Group 2: Moving into higher value activities

2. Value chain opportunities	
Finding	Recommendation
Many of the best niches for high value activities occur at the junctures between different GVC stages.	<ul style="list-style-type: none">• Evaluate entrepreneurial potential, expansion of existing businesses, and supporting consortium opportunities in these areas
Emerging technology opportunities exist in the shipbuilding sector	<ul style="list-style-type: none">• Focus sector development strategies and programs on actors that participate, and are leaders in, these trends.• Use province's innovation infrastructure to develop technology for sustaining and growing the shipbuilding industry.
Opportunities exist in systems engineering and technology program management .	Grow and nurture a pool of technology-based entrepreneurs <ul style="list-style-type: none">• Encourage entrepreneurial training in science (oceanography) and engineering programs at the undergraduate and graduate level• Expand program opportunities at Dalhousie to offer specialization in systems engineering.

Group 3: Regional Value Chain Development Activities

3.1 Connect with key players in the non-combat value chains

Finding

Nova Scotia is **not fully aware of the opportunity** offered by the NSPS vessels being built by SeaSpan.

- opportunities perhaps greater for NS firms
- requires extra effort, due to the distance and associated transactions costs

Recommendation

- **Increase engagement** with British Columbia and Vancouver
- Companies in Nova Scotia should work to **establish links** to the science vessel & icebreaker GVCs
- Foster greater cooperation within Atlantic Canada, through, for example, **multi-provincial trade missions** to Western Canada.

3.2 Plan for the future

Finding	Recommendation
<p>NSPS presents a tremendous opportunity for Nova Scotia and Atlantic Canada to develop a globally competitive shipbuilding sector in niche, high value areas.</p>	<p>Develop a plan for how to take advantage of the NSPS Shipbuilding opportunity for long-term advantage.</p> <ul style="list-style-type: none">• Increase the quantity of high quality research with commercial relevance• Grow and nurture a pool of technology-based entrepreneurs• Use province's innovation infrastructure to develop technology for sustaining and growing the shipbuilding industry.• Expand access and availability of investment capital to create and grow new companies

3.3 Broaden horizons

Finding	Recommendation
<p>Workforce issues are a persistent cause for uncertainty and concern in Nova Scotia's shipbuilding sector.</p>	<p>Conduct a local labor market analysis and workforce planning study.</p>
<p>Models, best practices, and lessons learned from other countries with large procurements are needed to illuminate capacity building and upgrading in Nova Scotia's shipbuilding sector</p>	<p>Conduct a comparative study of large, recent, and relevant government procurements to identify models, best practices, and lessons learned in other regions.</p>
<p>Opportunities exist for improving the development and coordination in the sector's technology and innovation programs</p>	<p>Evaluate opportunities and gaps in existing programs to develop a coordinated technology-based economic development strategy in the shipbuilding and ocean technology sector.</p>

A photograph of a beach at low tide. The foreground shows a large, smooth sand dune. The middle ground features a wide expanse of wet sand with visible ripples and patterns. In the distance, a dark boat is visible on the ocean under a cloudy sky.

Thank you
for your attention!

Duke University
Center on Globalization, Governance &
Competitiveness