#### Gains in Submarine and Ship Platform Design Efficiency through Innovative Life Cycle Management

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## Agenda

- D&B Shipyard Focus
- Design Efficiency
  - Systems Thinking
  - Sustainment
  - Unmanned Autonomous Ships
- Revitalization
- "Best Fit" LCC
- Recommendations



## D&B Shipyard Focus

- Build to **contractual** specification where the margins are pre-determined;
- Meeting the rigour of the **quality and standards** set by the military client;
- Developing and sustaining skilled workers for follow-on projects;
- Avoiding the peaks and troughs of shipbuilding by striving for a <u>continuous</u> <u>build program</u> with commercial and military platform orders;
- Maintaining <u>corporate integrity</u> through a high standard of platform build; and
- Achieving <u>cost savings</u> where possible and reaching an <u>acceptable profit</u> for the shareholders.

# Design Efficiency

- Strategic View
- Efficiency
  - Pre-Planning
  - Modelling Management
  - Schedule Management
  - Cost Estimating
- Iterative process
- Feedback, Comms, Lessons Learned are factors



# Systems Thinking

- Beware the hidden dangers
- Complexity is a reality
- Strive for transparency to avoid the unknowns



#### Sustainment – Four Principles

- **Performance** defence equipment that is operationally ready and mission capable
- Value for money the required outcomes are procured at a price commensurate with the market rate for comparable procurements
- Flexibility an adaptable and scalable support system that can readily be adjusted to changes in operational requirements and/or operating budgets
- Economic benefit leverage industrial benefits from defence procurements to create jobs and economic growth for companies in Canada

#### Uncrewed Autonomous Ships

- <u>Reduced costs</u> to crewing and maintaining skilled sea-faring members;
- Reduction in storage and living space for crews which allows for <u>more</u> <u>weaponized spaces</u> under the design margins for the ship;
- More compartment <u>space</u> for additional fuel to ensure enhanced endurance for the ship; and
- More <u>flexibility</u> for the Naval Architect and Marine engineers to utilise their design constraints with enhanced features to include additional equipment performance parameters and weapon capacity storage.

# Recognize Efficiencies

- Traditional vs Performance
- Lean approach
- Forecasting and trending
- Integrated Logistics Support

Rate

- Data Analytics
- Dashboard Reporting and Milestone establishment
- Plan for PM, CM, **Obsolescence**









OFSV



Polar Icebreaker



# Designing in "Best Fit" LCC Solutions

- Developing a design framework for integrating a <u>lean</u> sustainment system;
- Defining a new product development, acquisition, and sustainment process based on modular, <u>incremental</u> design and <u>leading edge</u> technology;
- Use of lean principles to determine cost savings, greater efficiency, and higher quality as we enhance responsiveness to military demands; and
- Minimizing disruption in the design efficiency through flexibility, performance, value for money and economic benefit for the respective client and Government purchases under consideration.



# Life Cycle of Platform

- ILS Elements
  - Maintenance Planning
  - Manpower and Personnel
  - Supply Support
  - Support Equipment
  - Technical Data
  - Training and Training Support
  - Facilities
  - Packaging, Handling, Storage, and Transportation
  - Design Interface
- Obsolescence Plan
- Materiel Sustainment
- Technology Insertion
- Update and Refresh
- Mission Orientated



Modernization of the Victoria Class submarine will extend its life into the 2040s

#### **The logistical Iceberg**

- cause support considerations to <u>influence both</u> <u>requirements and</u> <u>design</u>;
- define the support requirements which are optimally related to the design and to each other;
- design the required support
- acquire the required support; and
- provide the required support over the life of the equipment at the optimum cost.

Costs for **Development and Production** Packaging Infrastrucuture Service ransportation Personnel Training **Documentation** Software **Ground- and Test-Equipment** Spare Parts **Storage** Make Operation Make Life Cycle Disposal & Support Costs low **Costs transparent** 

ILS during development and production to avoid hitting the "logistical iceberg."

#### Recommendations

- Achieving <u>advanced planning</u> for all aspects of the program and project work supporting the submarine and ship design and build;
- Providing attention to cost estimating requiring <u>detail and realistic funding</u> appreciation before a build can be realised for its through life spending requirement;
- Developing a cohesive strategy with firm <u>Governance</u> by all stakeholders will allow for adequate efficiency gains throughout the life cycle management;
- Establishing a consistency in <u>achieved efficiencies</u> and <u>change management</u> is a feature throughout the life cycle where external factors will impact the design efficiency. i.e. obsolescence, increased capability, inadequate requirements, platform role change; and
- Employ <u>relational contracting</u> to allow for open dialogue early and often between the contractor and Government.

#### Naval Proverb!

#### Beginning is easy; continuing, hard.

*Japanese (on permanence and change)* 



# Thank You