



Littoral Combat Ship

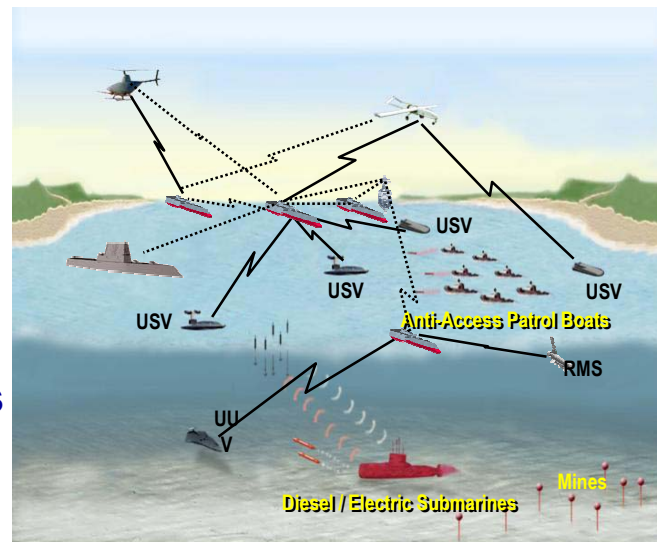
***Joint Meeting
INTERNATIONAL HYDROFOIL SOCIETY
SNAME Panel SD-5***

***Pete Czapiewski
NAVSEA 05D2/PMS 501SDM***

23 Sept 2004

Littoral Combat Ship (LCS)

- ◆ Optimized for warfighting in the littoral
 - **Unique designs for unique environment**
 - **Fast, maneuverable, shallow draft**
- ◆ Targeted at critical capability gaps
 - **Reconfigurable single mission focus**
 - **Mines, small fast surface craft, diesel submarines**
- ◆ Modular open systems architecture
 - **Flexible system for dynamic battlespace**
 - **Advanced unmanned air, surface, and underwater vehicles**
 - **Onboard sensors, weapons, command & control**
- ◆ Naval and Joint Force multiplier
 - **Operational flexibility for sea superiority and assured access**
 - **Integral member of future surface combatant family of ships**
 - **Fully netted with the battle force**



Built for the Network Age

LCS Design Concept



Fast,
Maneuverable,
Shallow Draft
Hull



Total Ship
Computing
Environment



Air &
Watercraft
Capability

C4I
Navigation
Self Defense
Radar
Vehicle Control
Maint & Support

Core
Systems



Core
Crew



SEAFRAME



LCS



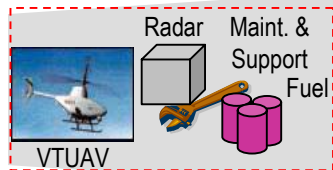
**MISSION
PACKAGE**

Core
Capabilities

Focused
Capabilities

MIW
ASW
SUW

Interface



Mission
Systems



Mission
Modules



Mission
Crew

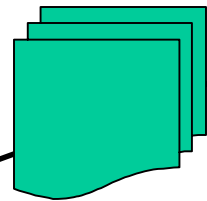
Flt 0 Requirements Process

**PD – Interim
Requirements
Document
(IRD)/FLT 0 CDD**



- Developed during Preliminary Design
- Invoked in Final System Design
- **Approved by Program Office with SEA 05 comments**

Issue Papers



P-spec



- Developed during Final System Design
- Invoked in Detail Design
- **Formal SEA 05 Approval**

**Build
Spec**

ABS NVR

OPNAVINST

**Specs &
stds**

Flt 0 Specific Characteristics

Characteristics	Threshold	Objective
Hull		
Draft @ FLD (ft)	20	10
Service Life (yrs)	20	30
Mission Package Payload ¹ (mt)	180 (105 Mission Package / 75 Mission Package Fuel)	210 (130 Mission Package / 80 Mission Package Fuel)
Propulsion & Engineering		
Sprint Speed @ FLD (kts) in SS3	40	50
Range @ Sprint Speed w/ payload (nm)	1000	1500
Range @ Transit Speed w / Payload (nm)	3500 @ 18 kts	4300 @ 20
Aviation Support		
Aviation Capabilities	Level I, Class I (1) MH-60 R/S and (3) RQ-8A VTUAVs	Threshold=Objective
Aircraft Launch/Recover	SS4 best heading	SS5 best heading
Water Craft Support		
Mission Package Boat Type	11m RHIB	40ft High Speed Craft
Watercraft Launch/Recover	SS3 best heading in 45 min	SS4 best heading in 15 min
Logistics		
Endurance (Provisions)	14	21
UNREP	CONREP, VERTREP and RAS	Threshold=Objective
Core Crew Manning	50	15
Crew Accommodations	75	Threshold=Objective
Time for Mission Package Changeout (days)	4	1
Total Cost per Ship		
Seaframe (\$M FY 05)	220	150
Mission Packages (\$M FY 05)	150	75

Note: 1. Mission Package Payload = all non-core systems, vehicles, helicopters, ordnance, and associated personnel, equipment, and containers to perform focused littoral MIW, SUW, and ASW missions.

ABS Rules/Classification

- LCS Flt 0 generally designed to ABS Naval Vessel Rules, with exceptions as specified in the P-spec (approved by both ABS and the technical warrant holders).

- ABS Classification required by contract for Flt 0

 - ABS operates as an independent third party retained by the Shipbuilder for the purpose of delivering a class certificate with the finished ship

- LCS Flt 0 will be Classified with the following ABS notations:

- ◆ **⌘A1 (E) Naval Combatant**
- ◆ **⌘AMS**
- ◆ **SFA(30)**
- ◆ **⌘ACCU***
- ◆ **NIBS**
- ◆ **R2-N**
- ◆ **FAS**
- ◆ **CONREP**
- ◆ **VERTREP**
- ◆ **ROTARY WING**
- ◆ **CPS***
- ◆ **RES***

*These notations To be incorporated into
⌘A1 (E) Naval Combatant

LCS Flight 0 Today

LOCKHEED MARTIN



GENERAL DYNAMICS









Gibbs & Cox • Marinette Marine • Bollinger Shipyards

Bath Iron Works • Austal • BAE Systems • CAE • MAPC

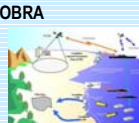
MIW MISSION PACKAGE

- (1) MH-60S
- 2 ALMDS
- 2 AQS-20A
- 2 AMNS
- 2 RAMICS
- 2 OASIS Sweep









MIW Mission Package +

COBRA









(3) VT-UAV



Common Vehicles


ASW MISSION PACKAGE

- (1) MH-60R
Torpedo Sonar
Sonobuoys
- (2) MMUSV
- (2) TOWED ARRAY
- (2) RMV
- TORPEDO COUNTERMEASURES
- MULTISTATIC SONOBUOYS









ASW Mission Package +

ADS



(3) VT-UAV



Common Vehicles

SUW MISSION PACKAGE

- MH-60R
Armed Helo
- (2) MMUSV
- 30MM Gun
- Hellfire Missile
- Netfires







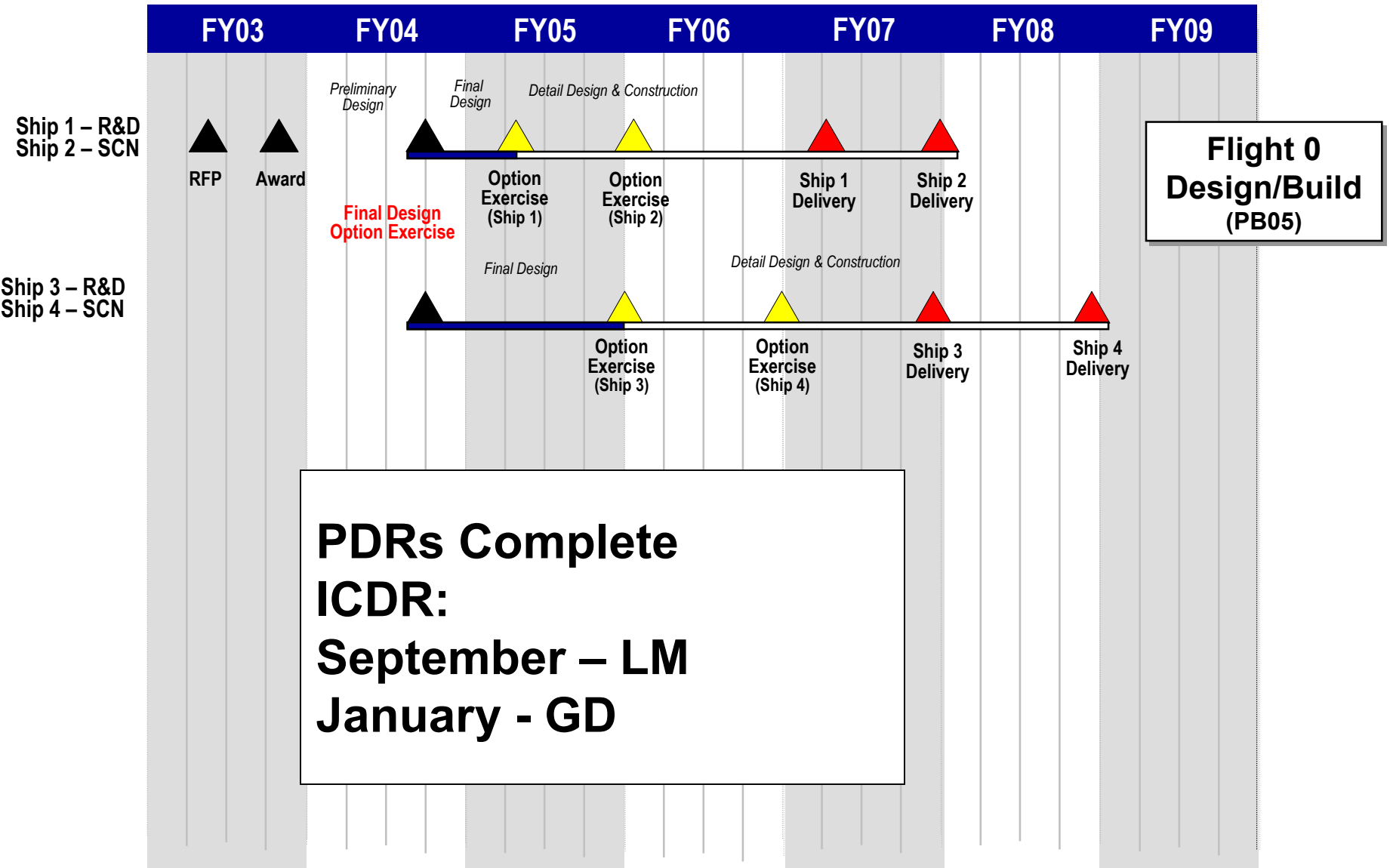
SUW Mission Package +

(3) VT-UAV



Common Vehicles

LCS F₀ Integrated Schedule



Lockheed Martin (LM) Artist's Concept



LM 115.5 m Semi Planing Monohull Physical Characteristics



SPECIFICATIONS

SPEED.....	45 knots
LENGTH (LOA).....	115.5 m
BEAM.....	13.1 m
DRAFT.....	3.7 m
DISPLACEMENT.....	2,840 MT

LM Mission Capability



CORE SYSTEMS

- **Self Defense:** Mk - 31 RAM Block 1, 3D Multi Purpose Volume Search Radar, Medium Caliber Gun, Towed Array Torpedo Alert System, EOD / Gun Fire Control System, SKWS Decoy Launcher System (SRBOC and LEADS), Multi - Purpose Sonar
- **Command and Control:** COMBATSS - 21, ICWS+, Squadron C2, SSDS
- **C4I:** EHF / UHF Satcom, VHF / UHF LOS, HF, CDL, LINK 16, INMARSAT

LM Mission Support

AIRCRAFT HANDLING

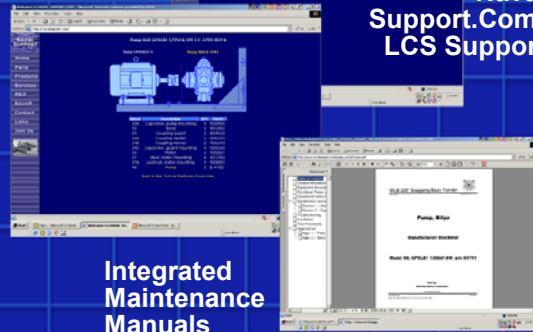


Hangar Can Accommodate Up to 2 Helos and 3 VTUAVs

TRIGON Handling System Easily Maneuvers All Aircraft

ON-SHIP LOGISTICS D2D MAINTENANCE SUPPORT

Drill Down to Components Specifications



Naval Support.Com: LCS Support

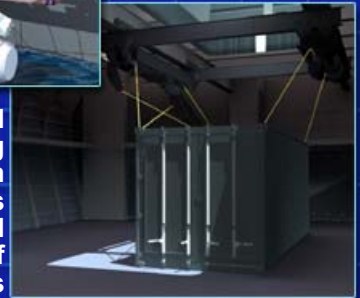
Integrated Maintenance Manuals

UNIVERSAL L&R AND HANDLING SYSTEM

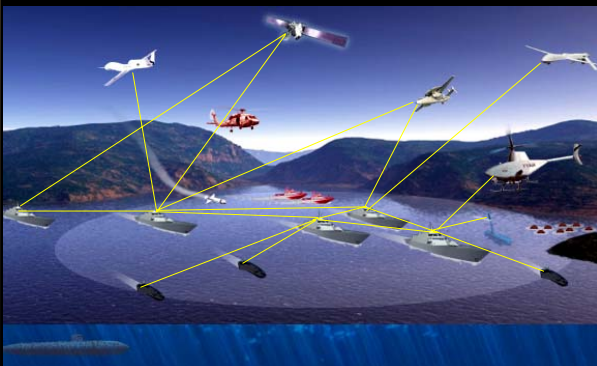


Supports L&R of RMVs and Boat Crews from Side Access Door

Overhead Handling System Provides Uninterrupted Transfer of Payloads

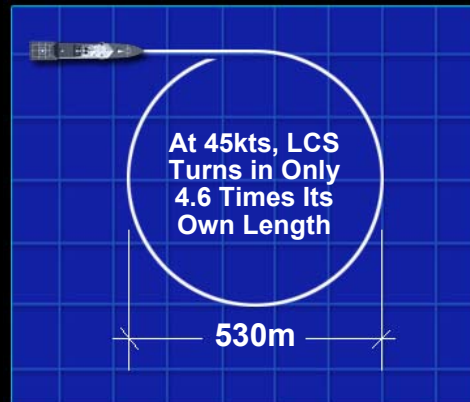


FULLY OPEN AND INTEGRATED MISSION SYSTEM



- Network-Centric Capability to Realize FORCENet

SEMI-PLANING MONOHULL MANEUVERABILITY



At 45kts, LCS Turns in Only 4.6 Times Its Own Length

530m

- Accelerates 0-45kts in <2 Minutes
- Stops in two ship lengths at 30 kts
- Turns in one ship length at 7 kts

44 MEMBER CREW



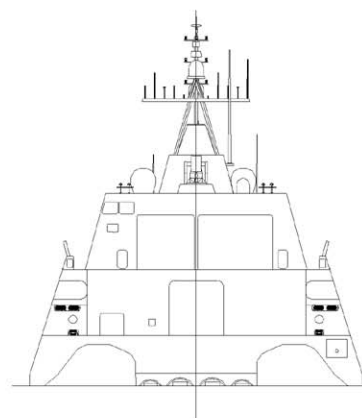
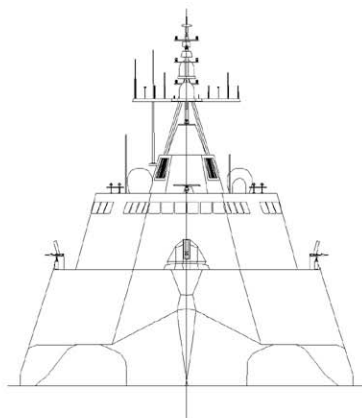
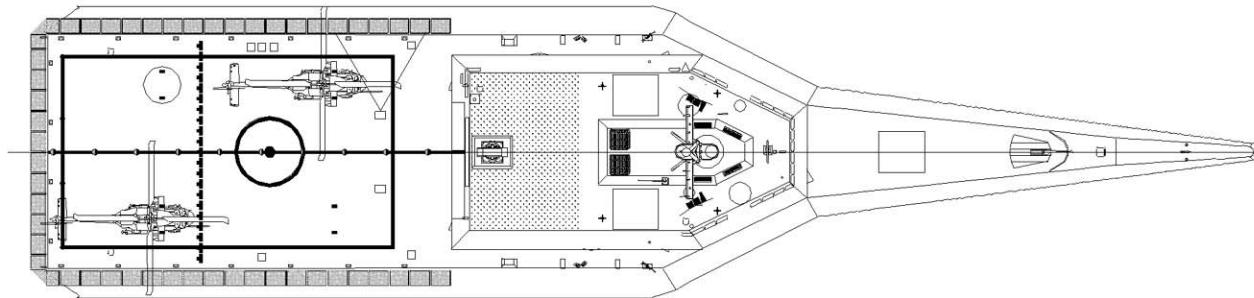
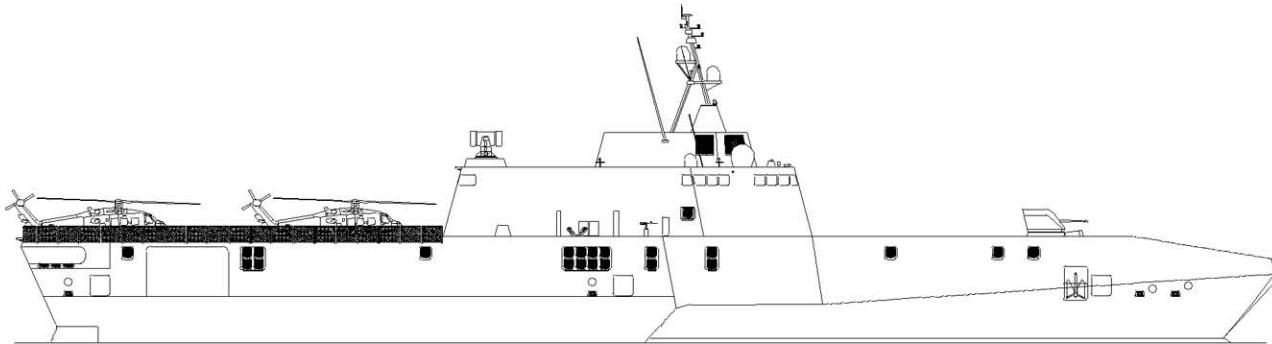
- Human-Centric Environment

General Dynamics (GD) Artist's Concept



GENERAL DYNAMICS Littoral Combat Ship

127m Trimaran Physical Characteristics



PRINCIPAL CHARACTERISTICS

- LOA 127.1 m
- BOA 30.4 m
- Packaged Mission Capacity 210 MT

PROPULSION & ELECTRICAL – CODAG

- Gas Turbines 2
- Diesels 2
- Waterjets 4
- Retractable Azi Thrusters 2
- Diesel Generators 4

AVIATION FACILITIES

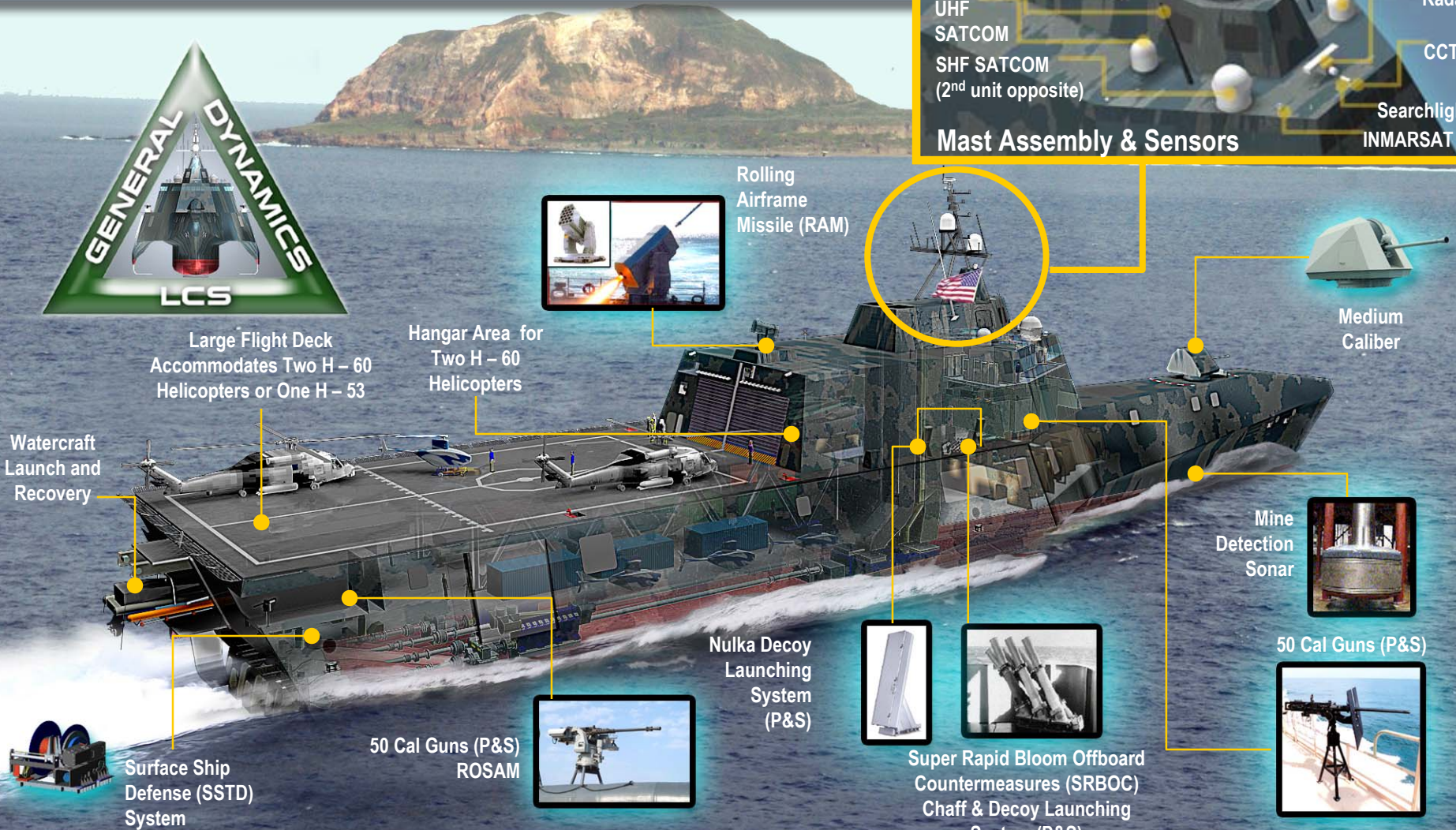
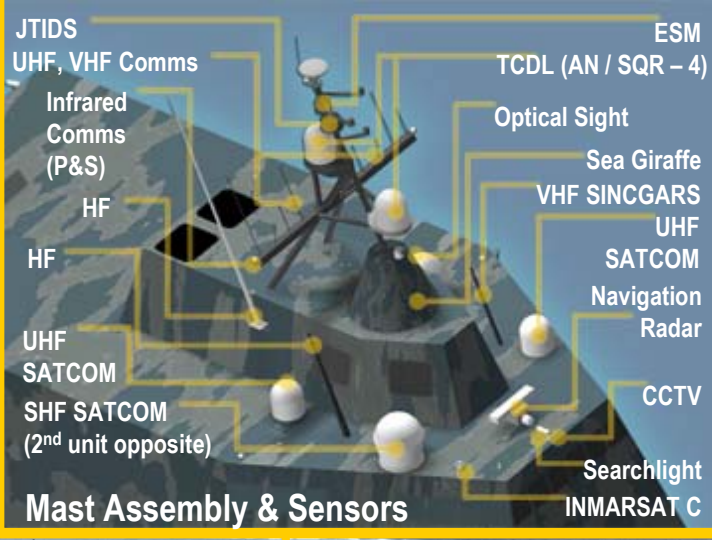
- Hangar for 2 H – 60
- Flight Deck Area for 2 H – 60 or 1 H – 53

SPRINT SPEED

- 47 Kts Fully Loaded with Fuel and Mission Packages with Sea Margin
- 50+ Kts Light Load with Core Mission Systems

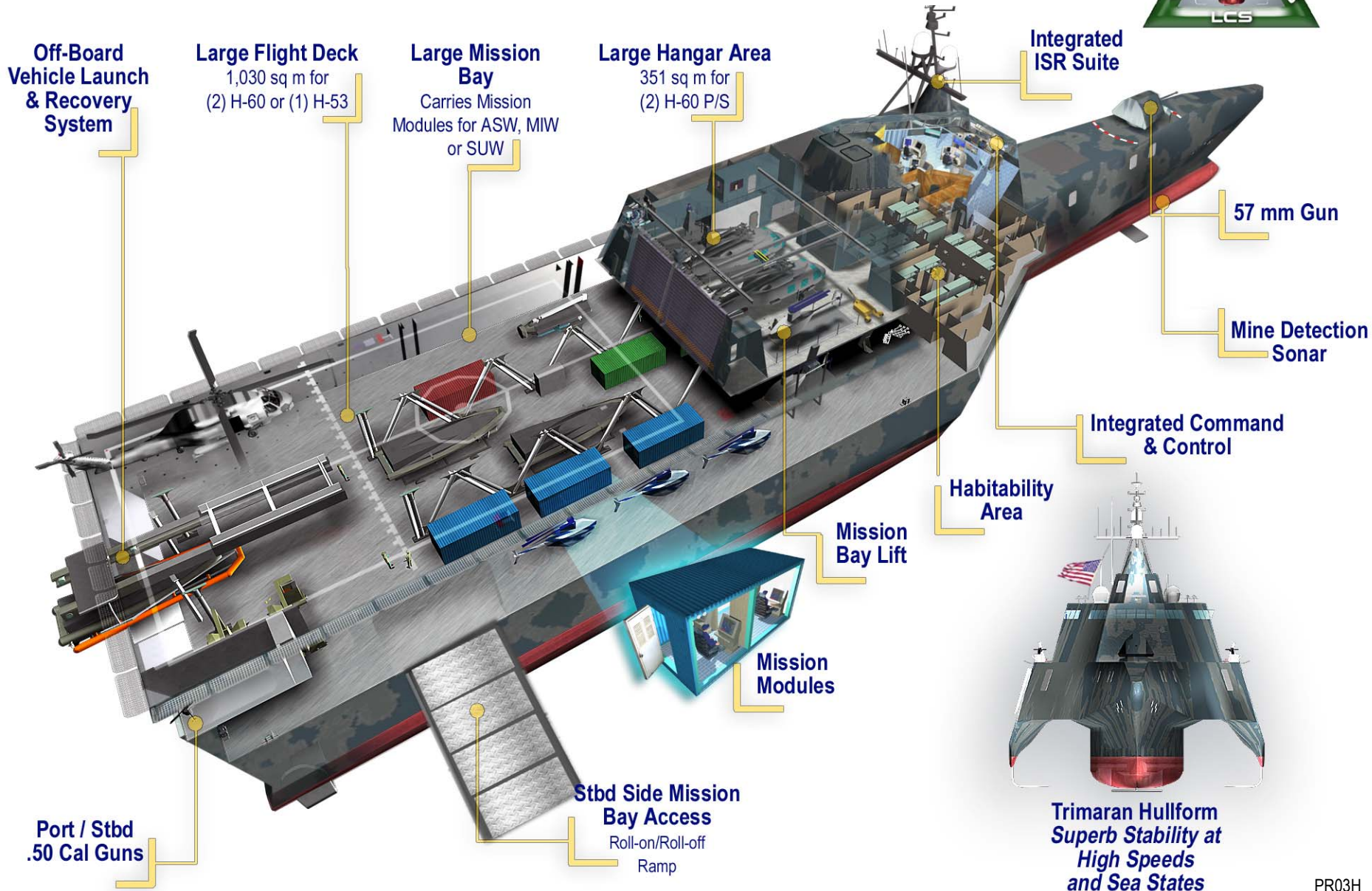
GENERAL DYNAMICS Littoral Combat Ship

GD Mission Capability



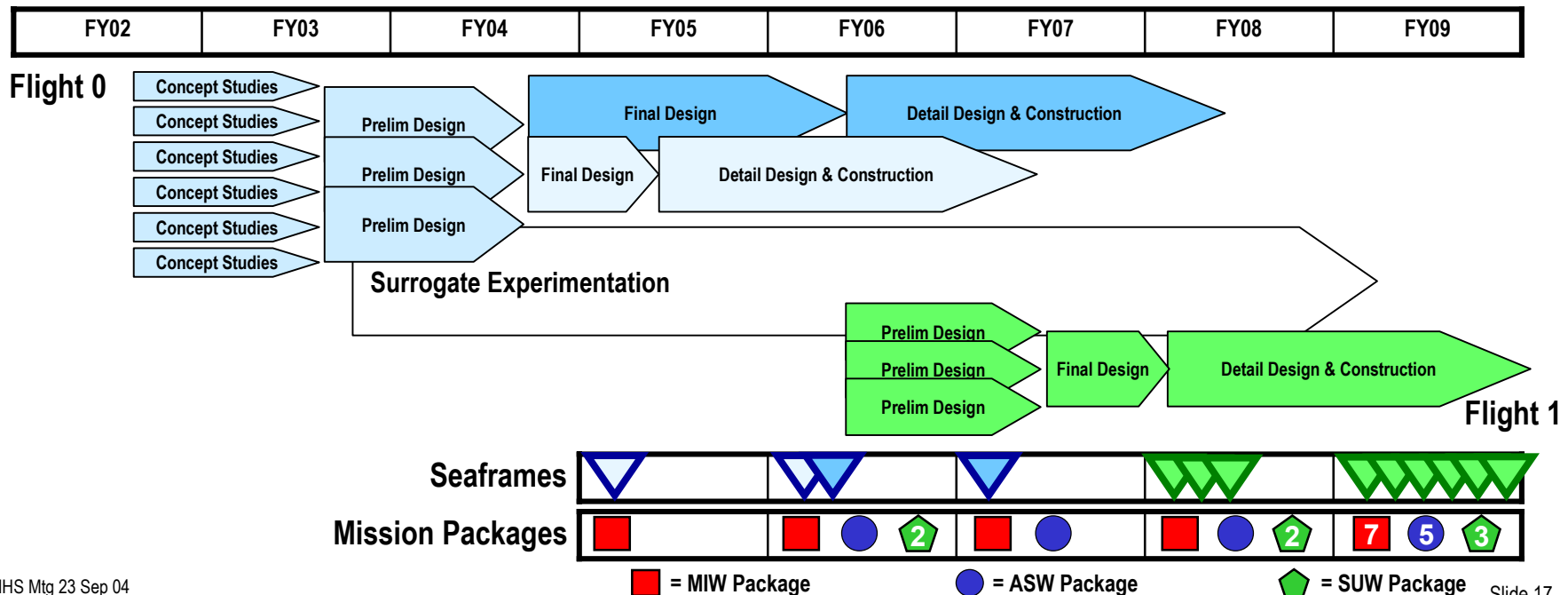


GD Mission Support



LCS Acquisition Strategy

- ◆ Evolutionary acquisition leveraging wide industry involvement
 - Flight 0 reducing risk and delivering immediate warfighting capabilities
 - Flight 1 optimizes seaframe for critical capability gap
 - Flight 1+ spiral development responds to threat and technology developments
- ◆ Mission package development and procurement decoupled from seaframe
 - Spiral A harvesting existing programs of record – the art of the certain
 - Spiral B coordinates developmental systems – the art of the probable
 - Spiral γ sets science and technology goals – the art of the possible



LCS Today

- ◆ **Approved ACAT ID acquisition program**
- ◆ **~ \$1B under contract for Final Design / Detailed Design & Construction**
- ◆ **Final Design Underway for two different Flight 0 Ships**
 - ★ **Cut Steel / Aluminum in four months**
 - ★ **First ship in the water December 2007**
- ◆ **Spiral alpha Mission Module composition solid**
 - **Procurement begins in October**
 - **Interface development ongoing through joint Industry / Government Integration Team**
- ◆ **Flight 1 Capabilities Document (CDD) development started**

... In Less Than Two Years from Program Start