Littoral Combat Ship (LCS) Briefing

to

UK-US Defense Industry Seminar

25 February 2003

Tysons Corner, Virginia

This Brief is provided for Information Only and does not constitute a commitment on behalf of the U.S. government to provide additional information and / or sale of the system.
U.S. Navy Surface Combatants

- Supports Sea Power 21
  - Sea Strike: Offensive Power
  - Sea Shield: Defensive Assurance
  - Sea Basing: Operational Independence

- Supports JV 2020 vision & objectives
  - Assured Access
  - Power Projection
  - Projected Defense

- Expands & enhances Surface Warfare core competencies

Netted
- Distributed
- Joint
LCS Concept of Operations

Networked Unmanned Vehicles
Surveillance / Communications

USV Anti-Access Patrol Boats

USV

UUV

Diesel / Electric Submarines

Anti-Access Patrol Boats

RMS

Mines

Control Net:

Data Sharing:
LCS Attributes

Complements
DD (X), CG (X) & in-service AEGIS fleet

Modular Mission Packages

Draws upon the capabilities & fire power of multimission ships

Signature Management

Shallow draft

LCS collective versatility

“Based on…”

Core Capabilities

Speed, maneuverability & responsiveness

Fully netted with the Battle Force

Self deploying & self sustaining

Employ unmanned air, surface & undersea vehicles

High payload fraction

Open architecture

Off-board systems

Networked

Draws upon the capabilities & fire power of multimission ships

Signature Management

Shallow draft

LCS collective versatility

“Based on…”

Experimentation at Sea. (HSV, SKJOLD, VISBY, TRITON)

Results of Global War Gaming, & FBEs

Fleet Input & Responses

Focused LCS Workshops

Studies & Analysis
Modular Mission Capabilities

Mine Counter Measure Package
- Provide organic punch through capability
- Search, map, avoid with limited neutralization
- Support remote & autonomous UVs and operate helos
- Massed LCS Division = Dedicated MCM capability

Small Boat Prosecution Package
- “Need to engage from close aboard to Over-The-Horizon”
- Stabilized gun and missile system
- Integrated with EO / IR system
- Include non-lethal capabilities
- Helos & off-board systems

Littoral ASW Package
- Integrated with multiple off-board sensor systems
- Automatic on-board processing
- Helicopter(s)
- Permits dedicated LCS ASW division

Inherent Missions
- SOF
- Maneuver, logistics, replenishment
- NEO
- MIO
- Medical …

Missions made possible by the removal of focused mission modules
# PD-IRD Specific Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Threshold</th>
<th>Objective</th>
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</thead>
<tbody>
<tr>
<td><strong>Hull</strong></td>
<td></td>
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<tr>
<td>Draft @ FLD (ft)</td>
<td>20</td>
<td>10</td>
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<tr>
<td>Service Life (yrs)</td>
<td>20</td>
<td>30</td>
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<tr>
<td><strong>Propulsion &amp; Engineering</strong></td>
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<tr>
<td>Sprint Speed @ FLD (kts) in SS3</td>
<td>40</td>
<td>50</td>
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<tr>
<td>Range @ Sprint Speed$^2$ (nm)</td>
<td>1000</td>
<td>1500</td>
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<tr>
<td>Range @ Economical Speed w/ Payload (nm)</td>
<td>3500 @ &gt;18</td>
<td>4300 @ 20</td>
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<tr>
<td><strong>Aviation Support</strong></td>
<td></td>
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<tr>
<td>Embark and Hangar</td>
<td>(1) MH-60 R/S and VTUAVs</td>
<td>(1) MH-60 R/S and VTUAVs</td>
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<tr>
<td>Flight Deck</td>
<td>Operate, fuel, reconfigure and support MH-60 R/S and UAVs / VTUAVs</td>
<td>Operate, fuel, reconfigure and support MH-60 R/S and UAVs / VTUAVs</td>
</tr>
<tr>
<td>Launch and Recover Aircraft (Best Heading)</td>
<td>SS4</td>
<td>SS5</td>
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<tr>
<td><strong>Water Craft Support</strong></td>
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<tr>
<td>Boat Type</td>
<td>11m RHB</td>
<td>40ft High Speed Craft</td>
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<tr>
<td>Launch and Recover (Best Heading)</td>
<td>SS3 in 45 min</td>
<td>SS4 in 15 min</td>
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<td><strong>Logistics</strong></td>
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<td>Provisions (days)</td>
<td>14</td>
<td>21</td>
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<tr>
<td>UNREP</td>
<td>CONREP, VERTREP and RAS</td>
<td>CONREP, VERTREP and RAS</td>
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<td>Core Crew Size</td>
<td>50</td>
<td>15</td>
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<tr>
<td>Crew Accomodations</td>
<td>75</td>
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<tr>
<td>Mission Reconfiguration (days)</td>
<td>4</td>
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**Note**

1. Mission Package Payload = all non-core systems, vehicles, helicopters, ordnance and associated personnel, equipment and containers and fuels to perform a single mission
2. Includes payload, where payload = heaviest possible mission package and core mission systems, but excludes ship’s fuel
Affordability

- Critical parameter for the LCS
- Smaller and less expensive
- Mission flexibility through the use of modular mission packages
- Allow the LCS to be procured in numbers required in the Global CONOPS
- Optimal mission manning
- Reduced life cycle costs
# LCS Integrated Schedule

(FY05 Flight 0, FY08 Flight I)

<table>
<thead>
<tr>
<th>FY02</th>
<th>FY03</th>
<th>FY04</th>
<th>FY05</th>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>FY09</th>
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<td><strong>Acquisition Milestones and Phases</strong></td>
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<td>Program Start</td>
<td>Program Initiation</td>
<td>IPR</td>
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<td>IPR</td>
<td>MS B</td>
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<td>Draft PD-IRD</td>
<td>ICD Development</td>
<td>CDD Development</td>
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<td><strong>Flight 0 (RDT&amp;E &amp; SCN)</strong></td>
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<tr>
<td>Ship</td>
<td>RFP</td>
<td>Select Prelim Designs (3)</td>
<td>Select Final Design(s)</td>
<td>Start 1st Ship DD &amp; Const</td>
<td>Start Ship 2 DD &amp; Const</td>
<td>1st Ship Delivery</td>
<td>2nd Ship Delivery</td>
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<td><strong>Flight I (SCN)</strong></td>
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<td>Award Concept Design (6)</td>
<td>Award Prelim. Design (3)</td>
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<td><strong>LCS Design / Build</strong></td>
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<td>Mission Packages</td>
<td>Zone Interface System Eng</td>
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<td><strong>T&amp;E</strong></td>
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<td>Early Participation</td>
<td>T&amp;E Strategy Development</td>
<td>DTI</td>
<td>DT Assist / Combined DT / OT</td>
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<td>T&amp;E Strategy</td>
<td>TEMP</td>
<td>TEMP Update</td>
<td>TEMP Update</td>
<td>EOA or OPEVAL</td>
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<td><strong>Documentation / Information Requirements (Notional)</strong></td>
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<td>MS A Products</td>
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<td>CRD</td>
<td>Analysis of Multiple Concepts</td>
<td>Acquisition Strategy Draft</td>
<td>T&amp;E Evaluation Strategy</td>
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<td>Exit Criteria</td>
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<td>C4I/SP</td>
<td>SAR</td>
<td>Acquisition Strategy</td>
<td>APB</td>
<td>Live Fire Waiver &amp; LFT&amp;E Management Plan</td>
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<td>AOA/Concept Exploration and Development</td>
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<td>1 R&amp;D</td>
<td>1 SCN</td>
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<td>3 SCN</td>
<td>4 SCN</td>
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<tr>
<td>Date</td>
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<td>23 Feb 02</td>
<td>ASN(RDA) directed establishment of LCS Program</td>
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<td>08 Jul 02</td>
<td>N76 letter provided interim direction to PEO(S) on top level objectives for exploratory studies for Family of Ships concept</td>
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<td>14 Aug 02</td>
<td>RFP released for Ship Concept Studies</td>
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<td>17 Sep 02</td>
<td>Establishment of LCS Program Office (under PEO(S))</td>
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<td>08 Nov 02</td>
<td>Contract award for Family of Ships Concept Studies (focused-mission high-speed ship)</td>
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<td>15 Nov 02</td>
<td>Congressional New Start approval for Littoral Combat Ship Program ($30M Congressional Plus-up)</td>
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<tr>
<td>Feb 03</td>
<td>Planned solicitation for LCS Flight 0 preliminary designs</td>
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</table>
## Near-Term Schedule

- **ASN decision meeting** | 07 Feb 03
- **Issue Synopsis** | 10 Feb 03
- **Acquisition plan (approved by PEO)** | 13 Feb 03
- **Draft RFP to Industry** | 14 Feb 03
- **Industry Day** | 20 Feb 03
  - **Issue formal solicitation** | 28 Feb 03
  - **Receipt of proposals** | 14 Apr 03
  - **Proposal evaluation** | Apr – Jul 03
  - **Contract(s) Award** | Jul / Aug 03
## RFP Structure – Preliminary Design

### Section - Title

#### Part I – The Schedule

- A – Solicitation / contract form
- B – Supplies or services and prices / costs
- C – Description / specifications / statement of work
- D – Packaging and marking
- E – Inspection and acceptance
- F – Deliveries or performance
- G – Contract administration data
- H – Special contract requirements

#### Part II – Contract Clauses

- I – Contract clauses

### Section - Title

#### Part III – List of Documents, Exhibits, and Other Attachments

- J – List of attachments

#### Part IV – Representations and Instructions

- K – Representations, certifications, and other statements of Offerors or respondents
- L – Instructions, conditions, and notices to Offerors or respondents
- M – Evaluation factors for award
Tasking

- Perform Phase I of LCS Flight 0 (Preliminary Design)
  - Meet operational needs and requirements established in Preliminary Design Interim Requirements Document (PD-IRD)

- Participate in four meetings
  - Initial kick-off Government site
  - Two In-Process Reviews (IPRs) Industry site
  - Preliminary Design Review (PDR) Industry site

- Submit proposal for Phase II (Final System Design and Detail Design and Construction)

<table>
<thead>
<tr>
<th>Period of performance</th>
<th>7 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contracts</td>
<td>Up to 3</td>
</tr>
<tr>
<td>Funding</td>
<td>Up to $10M each</td>
</tr>
</tbody>
</table>

Contract: Firm Fixed Price
Littoral Combat Ship (LCS) Preliminary Design (7 months)

- Program planning, scheduling, resourcing, contracting, and monitoring to complete the LCS Preliminary Design
- System engineering (including carpet plots)
- CAIV
- Specified Performance Document and Performance Spec
- Mission modularity and tech insertion and refresh
- Ship Integrated Information System
- Human system engineering, manning analysis
- LCES planning (including PBL considerations)
- Risk Management Plan
- Certification and qualification processes
- Integrated Data Environment
- Design Reviews (four meetings)
  - Initial Kick-off
  - In-Process Review #1 at approximately 60 DAC
  - In-Process Review #2 at approximately 120 DAC
  - Preliminary Design Review (PDR) at approximately 180 DAC
RFP Structure

Statement of Work Overview – Follow on Options for Final Design & Construction

Completion of LCS Final design (7 months) (Option)
- Completion of design (using performance spec as starting point)
- Deliver technical specification to support procurement decisions at conclusion of CDR
- Describe all systems, features, standards, components by which LCS will be detail designed
- Design Reviews (Two Critical Design Reviews)
  - Initial Critical Design Review (ICDR)
  - Final Critical Design Review (FCDR)

Non Recurring Engineering, Detail Design, Construction, and Production of LCS Flight 0 (Option)
- Non-recurring engineering, detail design, start-up manufacturing required to support ship construction, system integration, and ship and mission system equipment production
- Trials
- Operational Test and Evaluation
- Design Reviews
  - Initial Design Review is Spec review four (4) weeks after option exercise. Following Design Reviews at eight (8) weeks intervals
  - Ship Production Planning Conferences (SPPCs)
  - Performance Readiness Review (PRR) – at least thirty days prior to the start of construction

<table>
<thead>
<tr>
<th>OPTION ITEMS</th>
<th>SUPPLIES / SERVICES</th>
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<tbody>
<tr>
<td>0004</td>
<td>Final System Design (See Notes F and G)</td>
</tr>
<tr>
<td>0005</td>
<td>Data for 0004</td>
</tr>
<tr>
<td>0006</td>
<td>Special Studies for 0004</td>
</tr>
<tr>
<td>0007</td>
<td>Detail Design &amp; Construction for LCS 1 (See Notes F and G)</td>
</tr>
<tr>
<td>0008</td>
<td>Detail Design &amp; Construction of LCS 2 (See Notes F and G)</td>
</tr>
<tr>
<td>0009</td>
<td>Construction of LCS 2 (See Notes F and G)</td>
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<tr>
<td>0010</td>
<td>Data for 0007, 0008, 0009</td>
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<tr>
<td>0011</td>
<td>Special Studies for 0007, 0008, 0009</td>
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<td>0012</td>
<td>LCE&amp;S</td>
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<tr>
<td>0013</td>
<td>PIO</td>
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</tbody>
</table>
Mission Systems Development

Mission Zones

Offboard Organic Vehicles

Mission Modules

Dist. Mission Systems

Weapons Zone
**RFP Structure**

**Section J Attachments – Preliminary Design**

- Attachment J-1: Financial Accounting Data Sheet (to be provided at award)
- Attachment J-2: Security Requirements, DD-254
- Attachment J-3: Data Requirements
- Attachment J-4: Preliminary Design – Interim Requirements Document (PD-IRD)
- Attachment J-5: Mission System Architecture (MSA) Requirements
- Attachment J-6: Preliminary Design Review (PDR) Requirements
- Attachment J-7: Performance Specification Template
- Attachment J-8: CONOPS
- Attachment J-9: Option Items
- Attachment J-10: Navy Open Architecture Programs Criteria (Consists of three separate documents)
- Attachment J-11: Performance Based Logistics Guidance
- Attachment J-12: “Carpet Plot” Performance Grid Template
- Attachment J-13: Government Furnished Information (GFI)
Mid-Term Schedule
Post Preliminary Design Award

- Preliminary Design  
  17 Jul 03 – 11 Feb 04

- 1st update / contract modification for option items  
  03 Nov 03

- Final update / contract modification for option items  
  01 Jan 04

- Industry submit proposals for next phase  
  30 Jan 04

- Downselect to one or two for final design  
  28 May 04

- Exercise 1st construction option  
  18 Jan 05

- Exercise 2nd construction option  
  31 Dec 05
Potential International Cooperative Opportunities

- Industry to Industry Teaming on U.S. LCS Design and Construction

- Industry to Industry Teaming on mission module Design and Construction
  - Surf zone mine threat modules
  - Anti diesel submarine threats modules
  - Anti small fast surface craft modules

- Industry to Industry Teaming / data exchange on
  - Hull forms
  - Composites
  - Propulsors
  - Signature management
  - Human Systems Integration
  - Remote sensors
  - Other technologies
Potential International Cooperative Opportunities (cont)

- Vehicles For Communication
  - Direct Industry dialog
  - Web page establishment for initial dialog, introductions
    - WWW.LCSSHIP.COM
  - Navy Electronic Commerce On-line (NECO) – LCS Solicitation Information
    - WWW.NECO.NAVY.MIL
Summary

- U.S. Navy is committed to a littoral combatant to address asymmetric threats in the littorals

- LCS Program provides a vehicle for collaborative international teaming in a variety of ways

- Littoral combatant expertise is extensive in several Navies
  - The U.S. Navy and U.S. Industry would like to learn from that experience base