



# **LCS**

## ***Mission Modules Program***

### ***Training Strategy***

### ***Increasing Modularity for Maximum Adaptability***



### ***Brief for ImplementationFest 2010***

***10 August 2010***

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# Report Documentation Page

Form Approved  
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE <b>10 AUG 2010</b>		2. REPORT TYPE		3. DATES COVERED <b>00-00-2010 to 00-00-2010</b>	
4. TITLE AND SUBTITLE <b>LCS Mission Modules Program: Training Strategy Increasing Modularity for Maximum Adaptability</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Naval Surface Warfare Center,PMS 420L,Washington Navy Yard,DC,20376-7101</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES <b>Implementation Fest 2010, 10-12 Aug 2010</b>					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
<b>unclassified</b>	<b>unclassified</b>	<b>unclassified</b>	<b>Same as Report (SAR)</b>	<b>24</b>	

- Objectives
- LCS Mission Modules Program
- Sustainment Approach
- Training Approach
- Data Management Approach





# Objectives



- **Link program life-cycle management and training courseware management**
  - *(Principle of modularity)*
- **Link Mission Module design and training courseware design**
  - *(Courseware as a Life Cycle item)*
- **Use acquisition to reach open business model for technical data management**
  - *(Key to re-use of technical data for the government)*



# Overarching Need



- **Warfighting Capability Gaps** have been identified in JROC-approved ICDs
  - Assured Maritime Access in the Littorals ICD
  - Joint Undersea Superiority Capabilities Based Assessment / MCM ICD
- **Mine Warfare**
  - Shortfall of needed MCM capability to meet operational timelines
- **Surface Warfare**
  - Moderate capability against small boats with a layered defense approach
- **Anti-Submarine Warfare**
  - Insufficient capability to support fixed area and transit protection in high threat areas
- **JROC-validated and -approved the LCS Flight 0 CDD in May 2004**
  - JROC approval of LCS Flight 0+ CDD in June 2008



**Mission Packages**  
**Provide:**  
**Flexible,**  
**Scalable,**  
**Modular Warfighting**  
**Capability**



ICD: Initial Capabilities Document  
CDD: Capability Development Document

Statement A: Approved for Public Release, Distribution is unlimited

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# LCS Mission Modules



## Mission:

The LCS MPs will provide the Combatant Commanders a modular, focused mission capability to provide assured access against littoral mine, submarine and surface threats. Incremental acquisition of Mission Systems as they reach a level of maturity necessary for fielding. These systems provide a warfighting capability that will continuously improve through an evolutionary acquisition development process.

## Platform:

Littoral Combat Ship

## Employment:

LCS Mission Packages provide sufficient flexibility for the at-sea commander to successfully achieve assured access for evolving mission requirements.



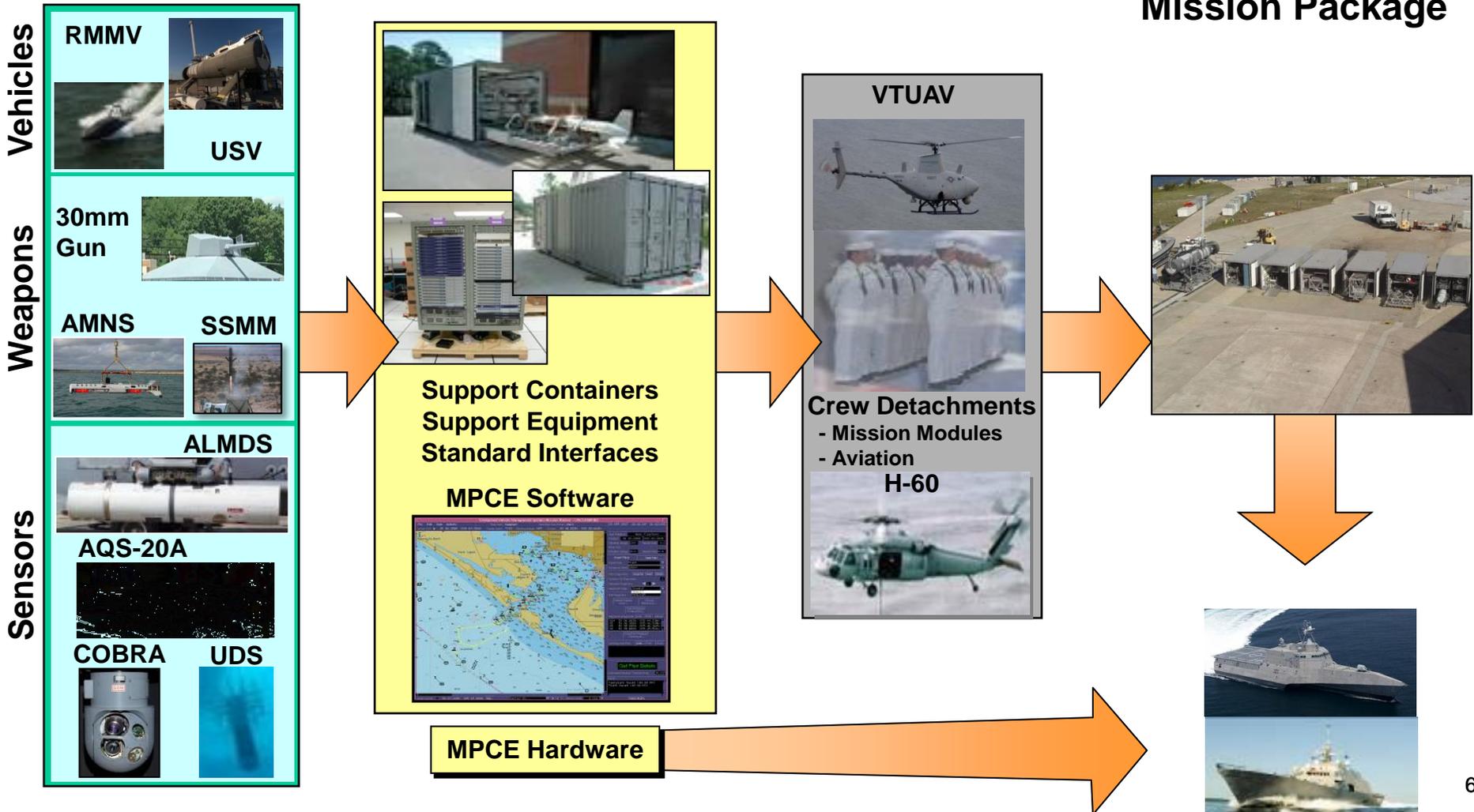


# Mission Package Defined

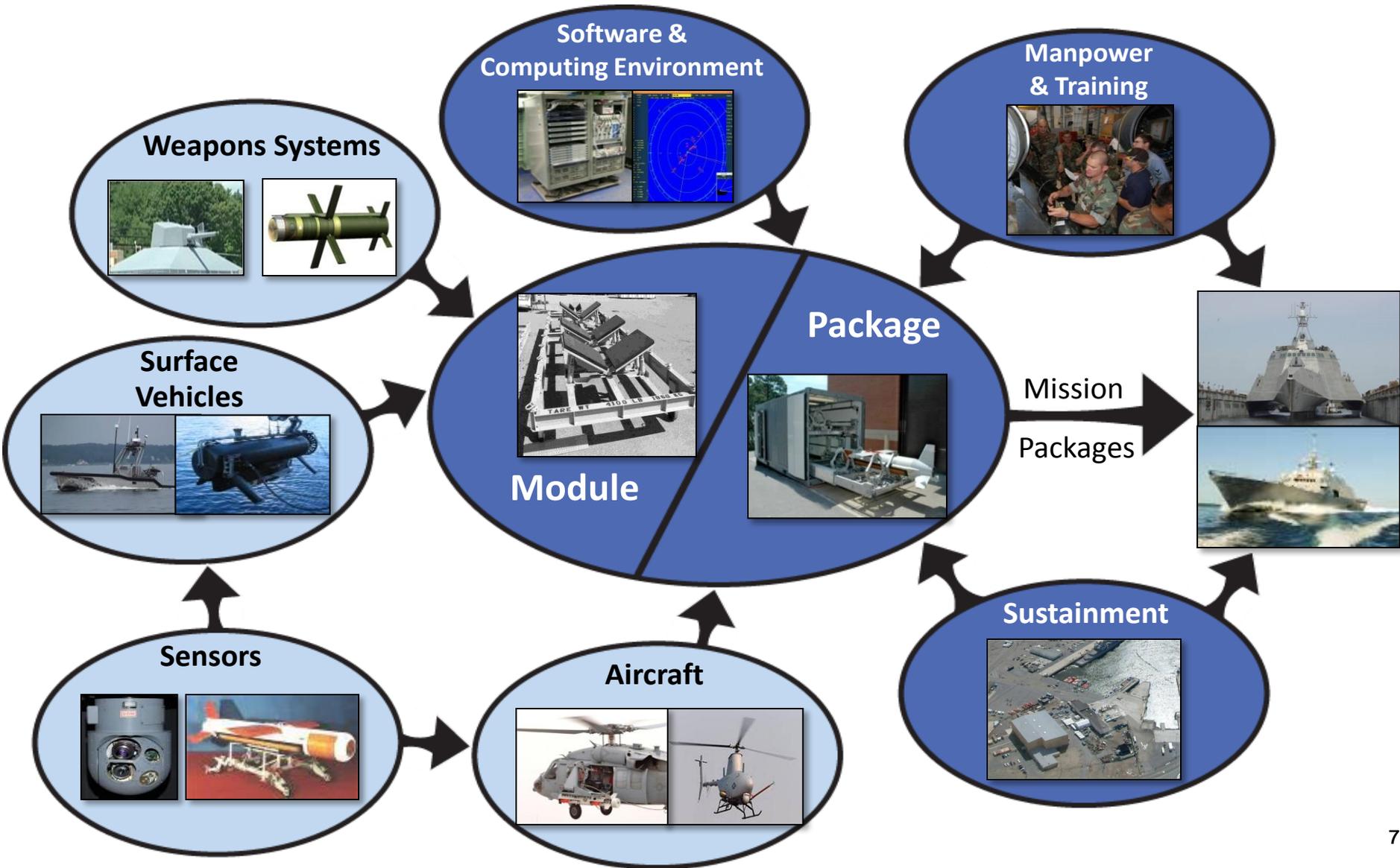


$$\left\{ \begin{array}{l} \text{Mission} \\ \text{Systems} \end{array} \right\} + \text{Support Equipment} = \text{Mission Modules} + \text{Crew \& Support Aircraft} =$$

**Mission Package**



# Mission Modules Complexity





# Mission Package Support Facility



## ***Mission...***

- O,I&D level maintenance management
- Distance Support for deployed MMs
- Configure certified Deployable Assets
- Troubleshooting and repair
- System Operability Tests
- Inventory management / visibility
- Validate ready-for-use status of MP
- PHS&T
- Shelf life material
- Authorized spares are on-board
- Replenish spares and consumables
- Expedite parts requests as required
- Arrange transportation of MMs
- Arrange embark and debark services

**Hub for all In-service Mission Modules**



# Employment Concept



Preparation: Mission Modules checkout at MPSF - Weapon Pwr Panel and diesel cooling system



Loading the Mission System in Support Container



Preparing Mission Module Support -or- Container for land transportation



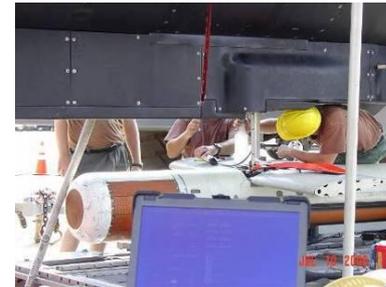
Mission Module Support Container loaded on C5 for air transportation



Mission Modules embarked aboard Seaframe (30mm GMM shown)



Mission Bay preparation to deploy system for operations



Mission System mounted on Vehicle



Mission Vehicle launched from Seaframe



Mission Operations



On-board maintenance



Packing up, preparing for debarkation at the end of deployment



Return to MPSF for required maintenance / modernization



# Specified Training Requirement



## Capability Development Document (CDD) for LCS Flight 0+

### Train to Qualify (T2Q)

Process of training, in an off-ship training environment, an individual in the knowledge, skills, and abilities required to competently perform tasks, at a basic level associated with a designated (specific) shipboard watch station or position.

### Train to Certify (T2C)

Process of training, in an off-ship training environment, a watch team in the knowledge, skills, and abilities required to competently perform tasks, at an advanced level associated with a designated (specific) shipboard watch stations or positions.

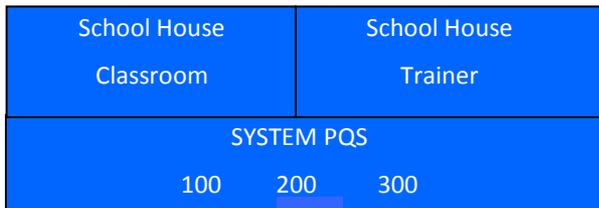
CDD Requirement	Threshold	Objective
<b>Mission Modules Crew</b>	<b>T2C</b>	



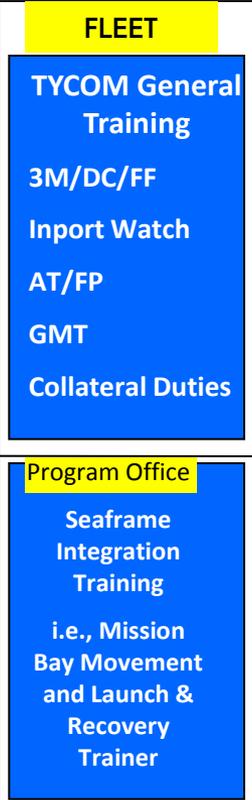
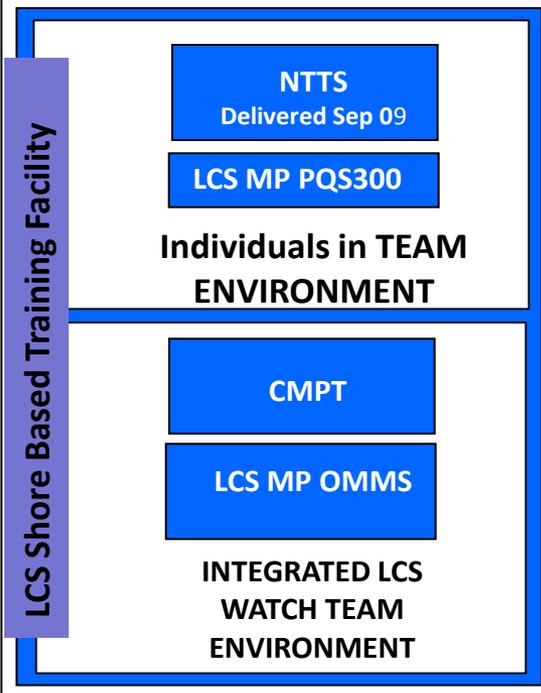
# Training Strategy



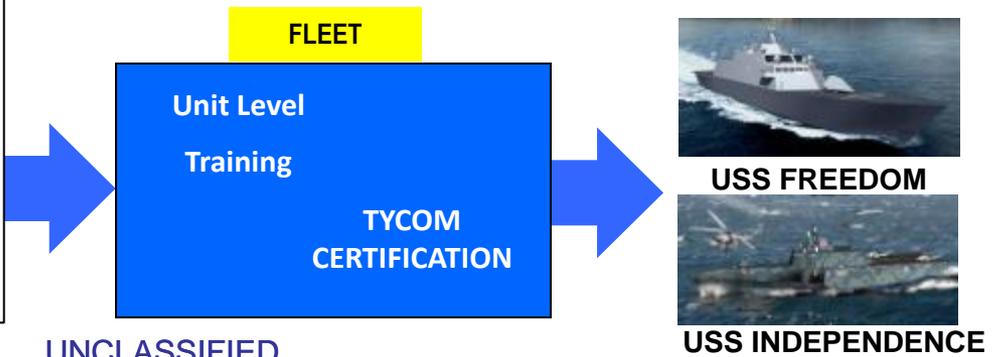
## Individuals Training (System/Subsystem)



## Team Training (Mission Package)



- **Sailor Ordered to TYCOM via pipeline training.**
  - "Individual Training" for assigned watch station/billet. Includes:
    - System Operations and Maintenance
    - "Tool" operation (i.e., MEDAL and NALCOMIS)
  - Schoolhouse training must support T2C (PQS 100, 200, & 300 series) and T2Q (Outcomes, Measures, Metrics, & Standards {OMMS}).
- **Sailor Reports to TYCOM for LCS MMs Training.**
  - Individuals training placed in LCS Context using emulation products and T2Q training achieved.
  - Training in Integrated Watch Team environment using Tactical Hardware/Software with Sim/Stim and T2C training achieved.
- **LCS ACADEMY rounds out remaining required training normally received while onboard.**
- **Specialized Seaframe Integration Training required to ensure safe operation at sea.**
- **Unit Level Training ashore integrates new sailors into LCS team**
- **ISIC conducts 'Certification' events.**





# Course of Instruction Mapping



## TEAM & TACTICAL TRAINING

SYSTEM OPERATIONS & MAINTENANCE TRAINING

### LCS Mission Package Introduction

4-5 weeks shore side ( 66% lab / 33% class)

Training Goals

LCS Environment (COTS Emulation)

- ICC2/MCC
  - MPCE
  - Electronic Tools
    - Mission Planning
  - Watchstation(s)
    - Console Proficiency
- Mission Bay
  - Support Containers
    - System Maintenance
    - Spares & Special Tools
  - System Movement
  - Launch & Recovery
- Weapon Zone
- Mission Area Tracks
  - MCM
  - SUW
  - ASW

### LCS CAPSTONE (T2Q achieved)

4-5 weeks shore side (66% lab / 33% classroom)

Training Goals (Scenario based training)

- MP Team Integration
- MP/Seaframe Integration
- Tactical Stand Alone & Integrated Trainer

### LCS MCM Specific Tactics & Mission

3 Weeks Shoreside

Training Goals

- Minefield Theory, Practice & Tactics
- Environment
  - Acoustic
  - Optical
  - Bottom & Clutter
  - Mine Location & Condition
  - Unique Situation
- MCM System Capabilities & Limitations
- Planning Considerations
- Tools (MEDAL/BSMT)
- Scenarios (Practical Exercises)

ASSIGNMENT TO SPECIFIC DETACHMENT

ULT: DETACHMENT TRAINING AND CERTIFICATION

NUMBERED FLEET CERTIFICATION FOR DEPLOYMENT

SEAFRAME / MP / AV EMBARK INTEGRATION ACTIVITIES



# Requirements, Strategies & Mapping



## LCS Requirements

Train to Qualify  
Train to Certify

## Competencies

Knowledge  
Skills  
Abilities

## LCS Strategy

Individual Training  
Team Training

## Objectives

Training  
Learning  
Performance

## LCS Course Mapping

Mission Package Intro  
LCS Capstone  
Tactics and Warfighting

## Courseware

ILT  
CBT  
M&S

# Data Requires Life Cycle Management



# LCS Mission Modules RTOC\* Effort



Sponsor	Vision Statement	Cost Benefit Analysis
<p>OSD/AT&amp;L - Reduction in Total Ownership Costs Program 2008</p> <p>PMS 420 – Program Management</p>	<p>Learning courseware and technical publications are developed and maintained based on consistent Integrated Logistics Support data.</p>	<p>Joint Institute for Defense Analyses/ADL Report -</p> <p><u>Tenets:</u></p> <ul style="list-style-type: none"> <li>Common Data Format</li> <li>Common Source DB</li> <li>API Linking Editors to CSDBs</li> <li>ECP Web Service</li> </ul> <p><u>10 Year Cost Benefit Analysis</u> 5.5% - 11.6% (74M – 146M)</p>

\* Reduction in Total Ownership Cost (RTOC)



# ***RTOC Statements and Tasks***



Technical data and human performance requirements are not consistently factored into product acquisition or product life cycle support.

***Task: Training Needs Analysis in the Systems Acquisition Process Study***

Technical data is managed and produced in a variety of formats, not linked together, and not simultaneously managed.

***Task: Conversion of Q-20 and MK30 50MM learning content to S1000D***

Learning content development tools are not integrated into life-cycle-managed technical databases.

***Task: Development and implementation of API to integrate learning content development tools with common source databases.***

Technical information managers cannot efficiently identify what product support content may be impacted by an engineering change proposal.

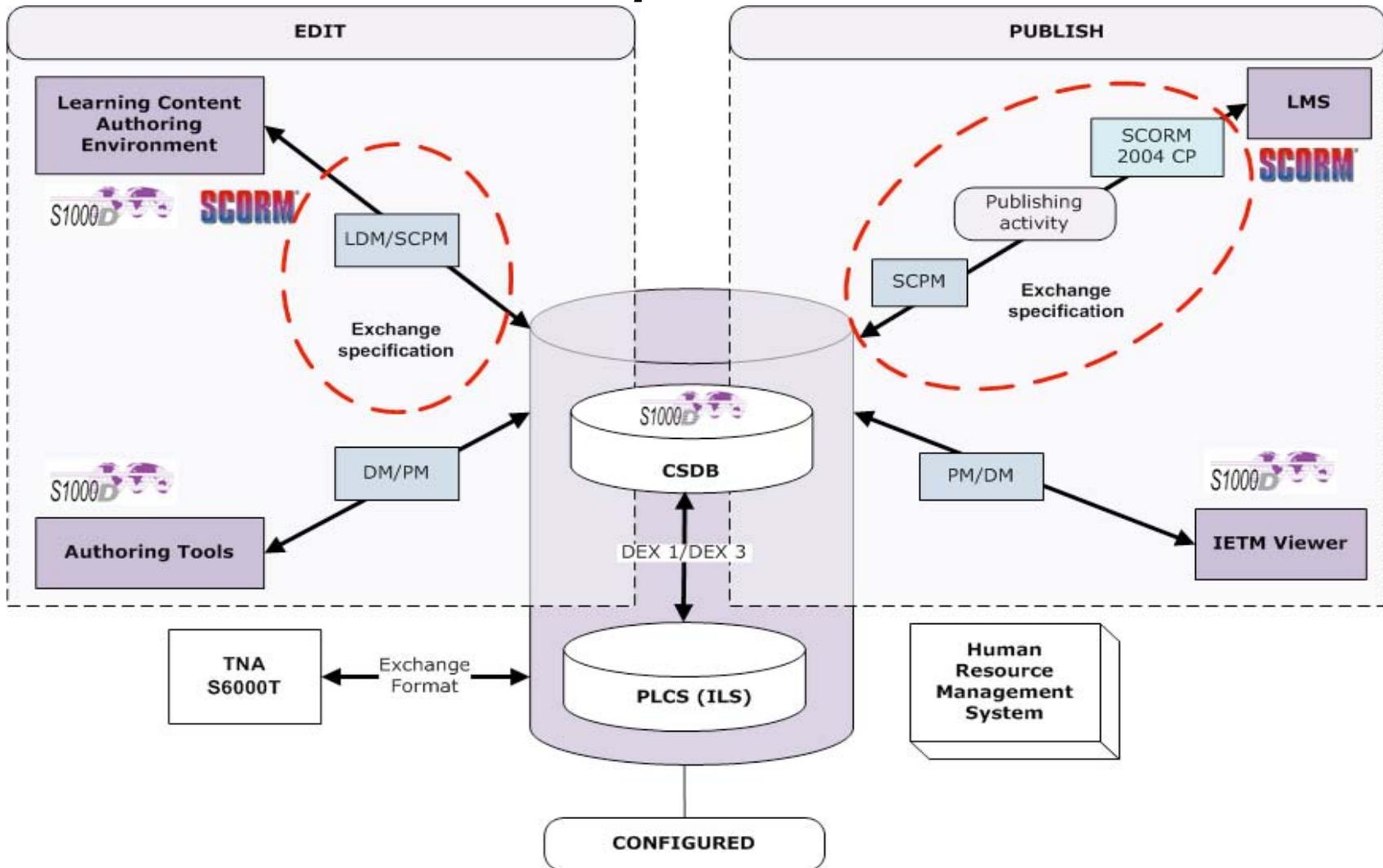
***Task: Development of web service to search common source database for data modules to review based on ECP.***



# Courseware & Tech Data Together



## Conceptual View



- **Technical Standards are key to *advancing modularity***

Shared  
Content  
Object  
(SCO):

Forward  
Looking  
Assembly



To link learning data to equipment,  
*and* to reuse learning data in related courseware,  
***use a standard that describes the courseware and the system!***

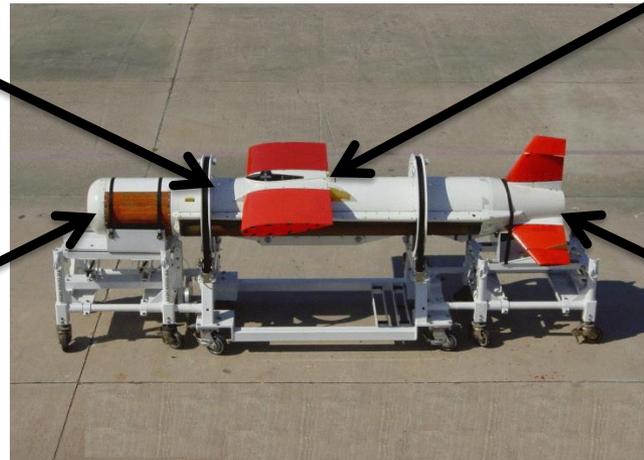
# Link Design to Training

SCO:  
Mid-  
Sectional

SCO:  
Wing  
Assembly

SCO:  
Forward  
Looking  
Assembly

SCO:  
Tail  
Assembly

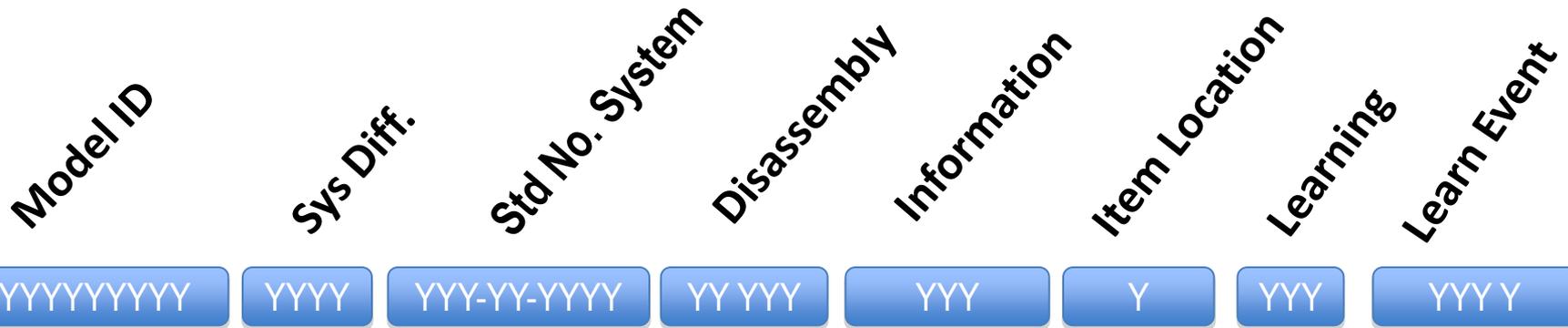


**Mission Module Sensor**

**Key Life Cycle Challenge: Shareable Content Objects (SCOs)  
as Design and Technical Data Change**



# Standardization Allows Modularization



Codes

The Basic Unit of S1000D: *The Data Module*

The Data Module File Name: *A Data Module Code*

***A Data Module Code Describes the Courseware and the System***



# Challenges



- **Acquisition**
  - Procure weapon systems using an open business model
    - Use of Open Architecture Guidelines
  - Procure weapon systems whose technical data is reusable
    - Procure source data in S1000D; procure courseware in SCORM
  - Legacy systems
- **Training Strategy**
  - Know training requirements before writing training contracts
  - Know how to chunk courseware (training modularity)
  - Know how to chunk courseware into Learning Data Modules

**Challenge is Enterprise Wide**



# Summary



- Link approach to life cycle sustainment and training courseware management.
  - *(Principle of modularity – Use of standards)*
- Link approach to LCS equipment design and courseware design.
  - *(Courseware as a Life Cycle item – Use of S1000D)*
- Use acquisition to reach modular data strategy.
  - *(Acquisition as key to courseware configuration – Know your requirements)*



# Why? **THEY *FIGHT* for US**



# **WE *WORK* for THEM**



# BACKUP



# **CSDB - Naval Education Training Command Pilot**



Navy Enterprise Technical Learning Content Management

A Pilot:

Learning Content Identification, Analysis, and Migration

Leveraging Navy Enterprise Technical Data Infrastructure in  
Support of Learning Content Management and Production