Capabilities for Enabling Seabase Logistics

(For Materiel Packaging, Handling, Transfer, and Asset Visibility Systems)

High Capacity Alongside Sea Base Sustainment (HiCASS) Industry Day

23 October 2003

Francis Brennan,
Representing NSWC Team

NSWC Team

(Established October 2000)

Membership

- NSWCCD
- NSWCCD-SSES
- NSWCIH-PHST
- NSWCPHD – UNREP
- NSWCDD-CSS

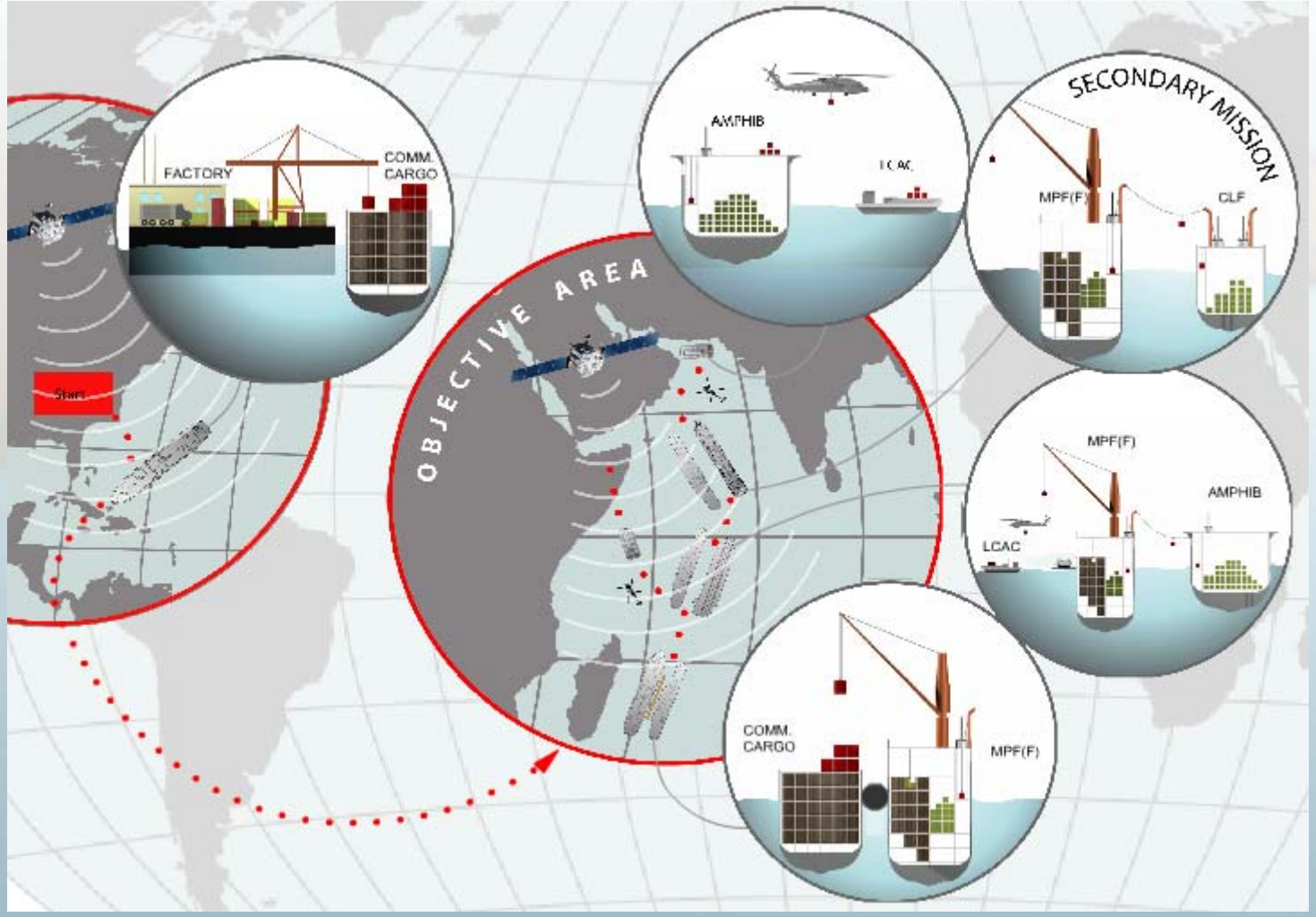
Recognized Technical Experts for:

- Packaging/PHST
- Intraship Materiel Handling Systems
- Intership Materiel Transfer Systems
- Total Asset Visibility Systems

Experience/Background

- Team Support to PMS325
- Active with Fleet/RDT&E/Engineering Initiatives
- Partnerships with Industry, Academia, Government
- Members Support SDM's/APM's for New Acquisition Programs
- Members of NavOpLog Integration Program (Integration Team)
- Participants on Related Working Groups (e.g. JILWG, AIT SG, etc)

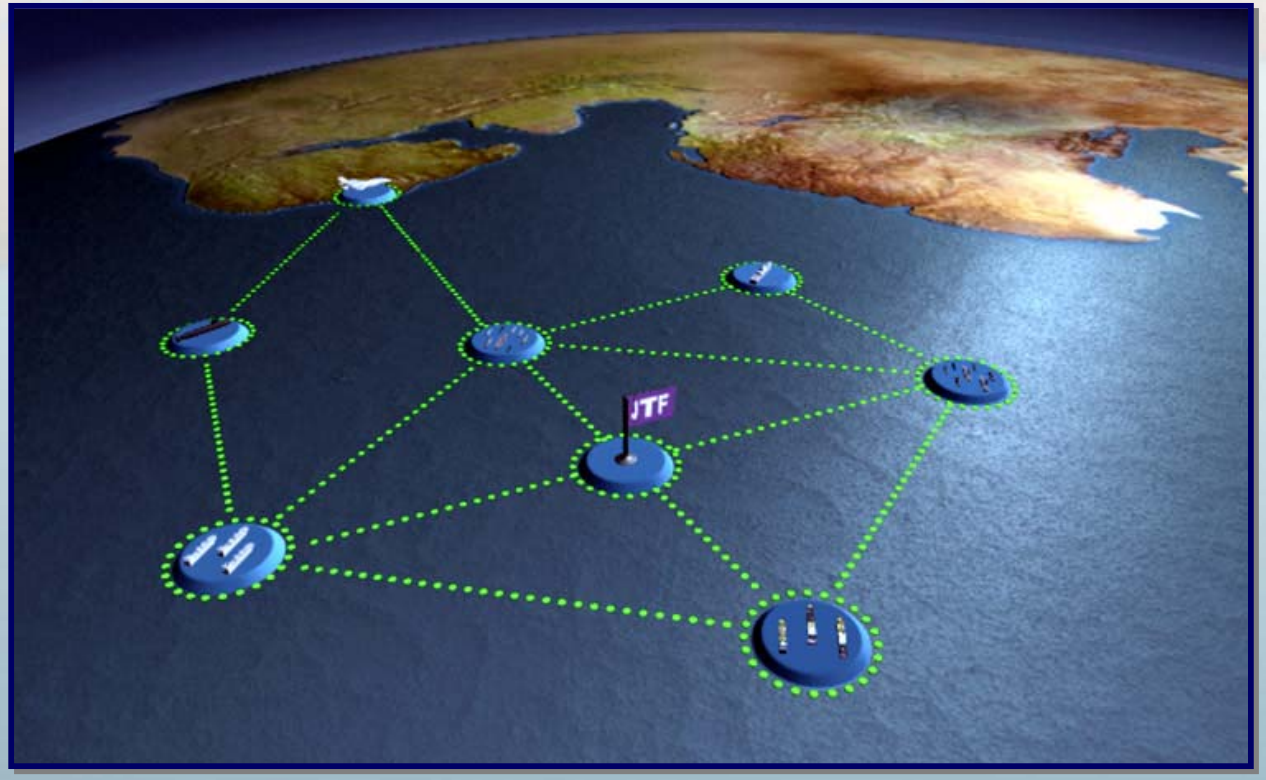
Seabase Scenario



Seabase Capabilities

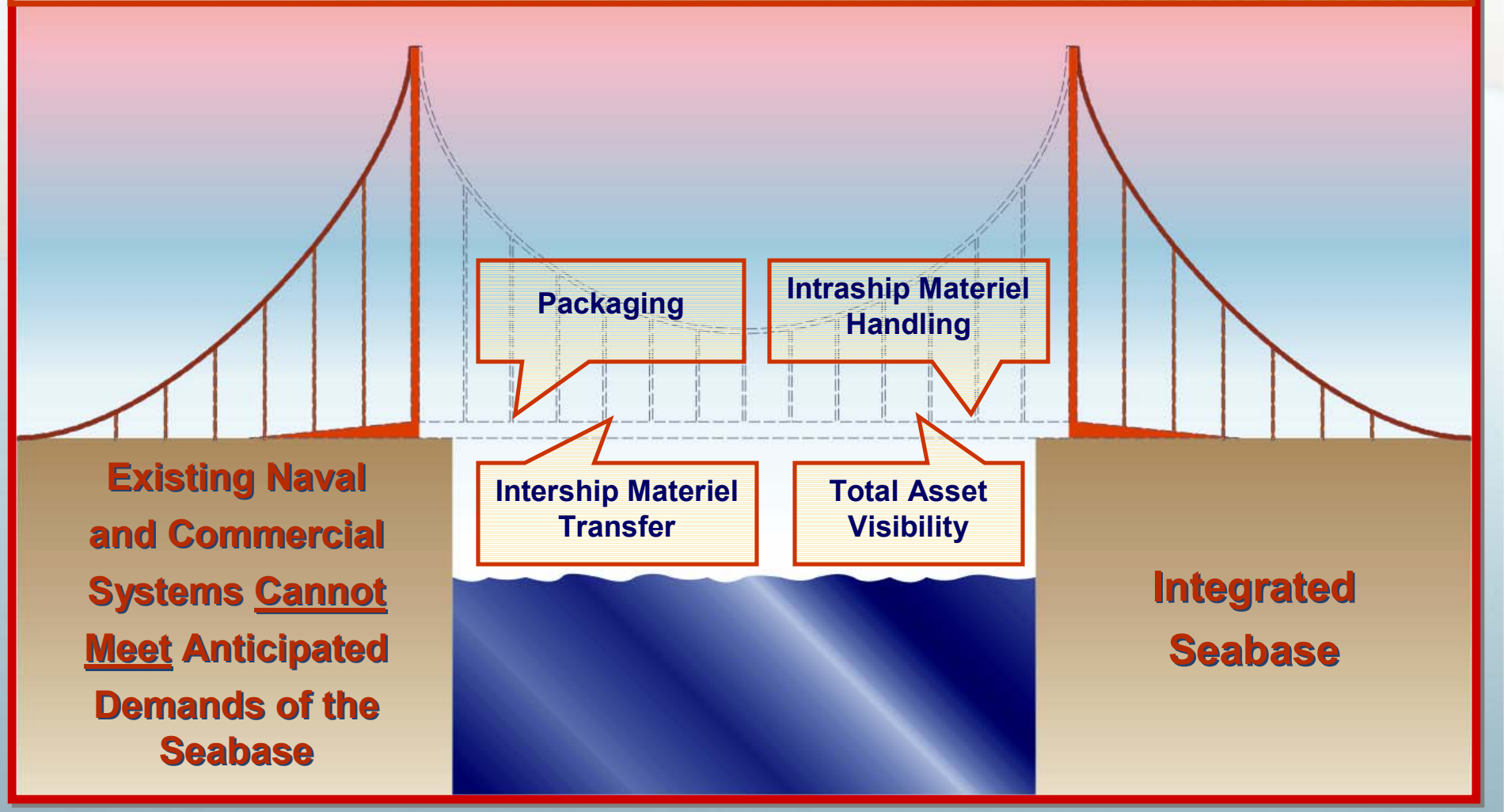
(For Materiel Packaging, Handling, Transfer, and Asset Visibility Systems)

Ships within the Seabase Need an Integrated Capability to Perform ***Operational Logistics Functions*** with More Efficiency, More Flexibility, and without Dependence on Shore Based Infrastructure



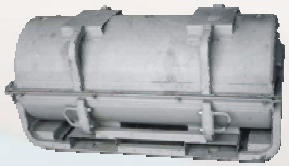
Bridging the Gap

Integrated Solutions for Bridging the Gap Between Current and Desired Seabase Logistics Capabilities Will Require Enabling Technologies and Engineering/Process Improvements



Why Change Packaging?

- Throughput Requirements Cannot be Met with Break Bulk Operations
- Too Many Different Boxes
- Inefficient for Retrograde
- Boxes Are Segregated by Contents (Ammo)



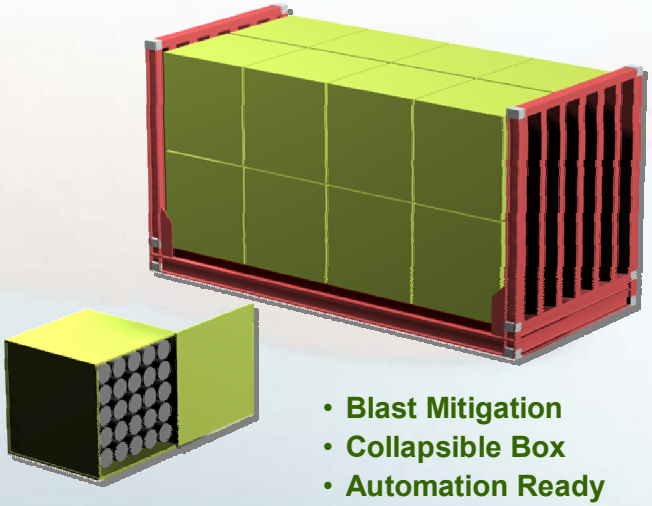
Customized Shapes

Packaging/Banding Waste

Improvements in the Logistics Pipeline Must Start with Packaging

Desired Capabilities for Packaging

- Modular System Design
- Combat/User Configured Loads
- Rapid Breakout
- Effective Force Reconstitution
- Reduction in Waste
- Efficient Stowage of Incompatible Loads



- Blast Mitigation
- Collapsible Box
- Automation Ready
- Intermodal Compatibility

Advanced Packaging is Needed to Add "Intermodal Capability" and Enhance Break Bulk Capability to Efficiently Meet the Sustainment Requirements of the Seabase

Why Improve IntraShip Materiel Handling?

- Ship-to-ship Transfer Rate Exceeds Strikedown Rate
- Massive Pre-stage Required
- Selective Access Requires Significant Maneuver Space/Operations
- No Dedicated Handling Paths/Various Choke Points
- Multiple Material Handling Equipment (MHE) Handoffs
- Manual Stowage/Dunnage Systems
- Elevator Load Carrying Capacity Not Fully Utilized
- Multiple Single-purpose MHE Types

Massive Pre-stage

Manual Stowage

Secure for at Sea - Dunnage

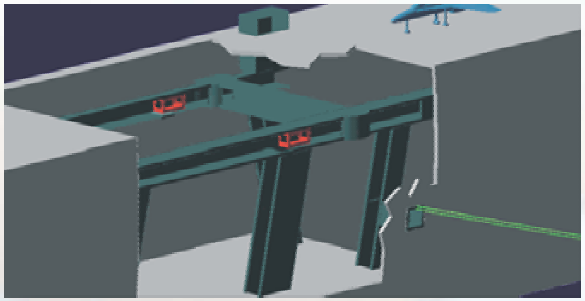
Massive Pre-stage

Handling Transitions

Strikedown & Stowage Systems Are the Leading Contributors to an Unbalanced Logistics Pipeline System

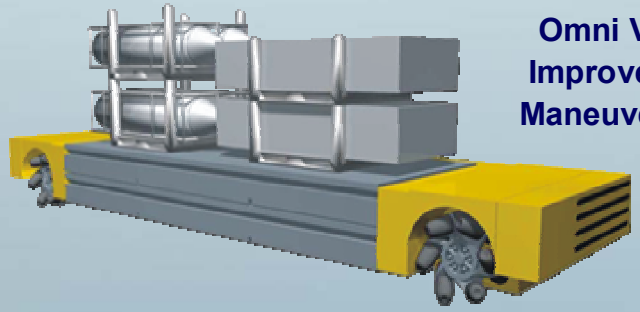
Desired Capabilities for IntraShip Materiel Handling

- Strikeup/Strikedown at the Same Rate as Delivery or Transfer (Balanced System)
- Selective Offload and Stowage of Material and Vehicles
- Automated Materiel Handling
- Automatic Elevator Loading/Unloading
- Tailored/User Configured Load Assembly
- Intraship ISO Container Handling
- Container Stuffing and Unstuffing



Linear Electric Drive Transport

Multi Platform Ropeless Elevators



Autonomous
Omni Vehicle
Improved MHE
Maneuverability

ASRS

Internal Handling and Stowage Systems Will Need to Meet Significantly Greater Throughput Rates and Selective Offload Capability

Why Change Intership Materiel Transfer?

- Sea State Limits Ship, Lighterage, and Other Platform Operations
- Efficient Transfer of Materiel, Vehicles, and ISO Containers Between Vessels is Needed
- Heavy Load Transfer Capability is Inadequate

Skin to Skin Replenishment
Limited to SS2 at anchor

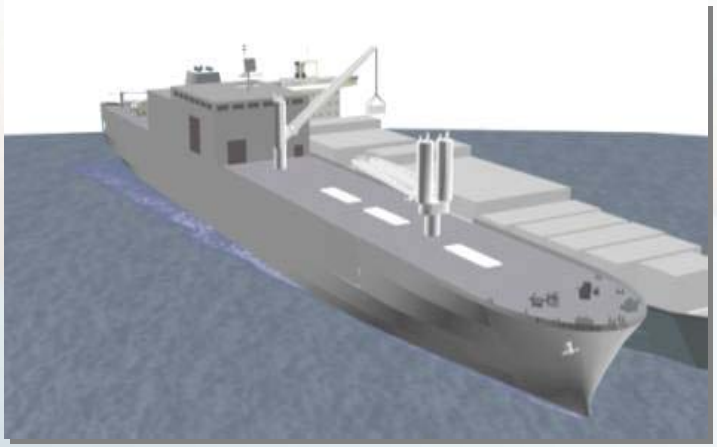
Vertical Replenishment

Connected Replenishment
Limit: 5,700 lbs SS3

The Evolution of Intership Materiel Transfer is Essential to Support the High Capacity Transfer and Throughput Demands of the Seabase

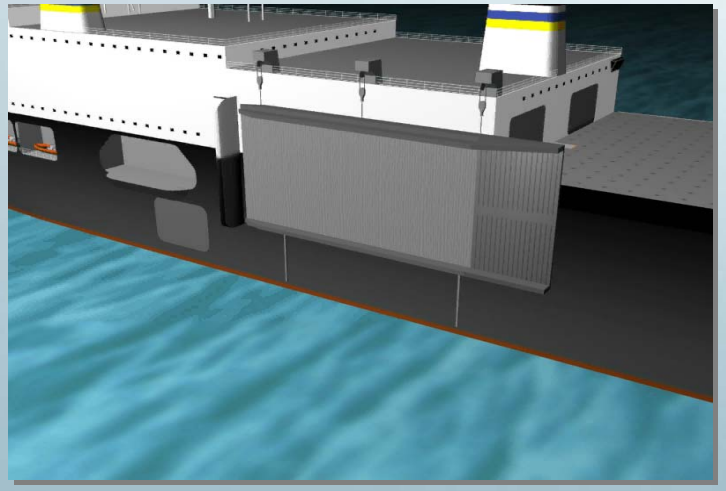
Desired Capabilities for Intership Materiel Transfer

- Intermodal/Commercial Interoperability
- Increased Sea State Capability
- Increased Overall Throughput
- Improved Retrograde Transfer Capability
- Heavy Transfer Capability
- Reduction in Time Alongside
- Improved Small Surface Craft Interface



Motion Compensation Ship Roll Mitigation
Advanced Fendering/Mooring

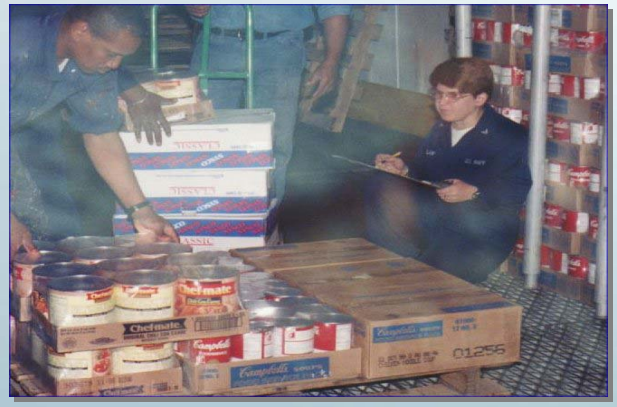
Heavy 12K UNREP: Total Load Control, Station Keeping, Wireless Ranging, Wireless Data Link, Tensioned Ropeway



Ship to Surface Craft Interface

Why is Real Time Total Asset Visibility Required?

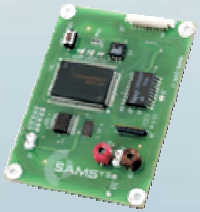
- Current Methods Are:
  - Time Consuming, Manual, Paper Based Systems
  - Stovepiped Logistics Processes
  - More Conducive to Errors or Redundant Accounting
  - Not Conducive to Continuous Tracking From Factory to Warfighter
  - Not Conducive to the Efficient and Flexible Selective Offload and Reconfiguration of Loads
  - Lacking Integration with:
    - Materiel Handling & Transfer Systems
    - Shipboard Networks
    - Logistics Information Systems (NTCSS)
    - Cargo Loading and Planning Tools



Requires Integration of Tools and Processes That Are Technically Achievable Today

Desired Capabilities for Total Asset Visibility

- **Automation of Supply Chain Information Systems**
- **Real Time Data Provided to:**
  - Naval Tactical Command Support System (Existing)
  - Enterprise Resource Planning (Future)
- **Integration with Automated Materiel Handling Systems**
- **Automated Cargo Loading and Planning**
- **Open, Scalable and Standards Based Architecture**



RFDC
RFID
Smart Shelves
Sensor Tags

Real Time Total Asset Visibility is Required to Manage High Volume/High Tempo Movement of Materiel

Contact Information

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- Visit ONR FNC Website at www.onr.navy.mil/explog/default.asp
- Or Contact NSWC Team Members:

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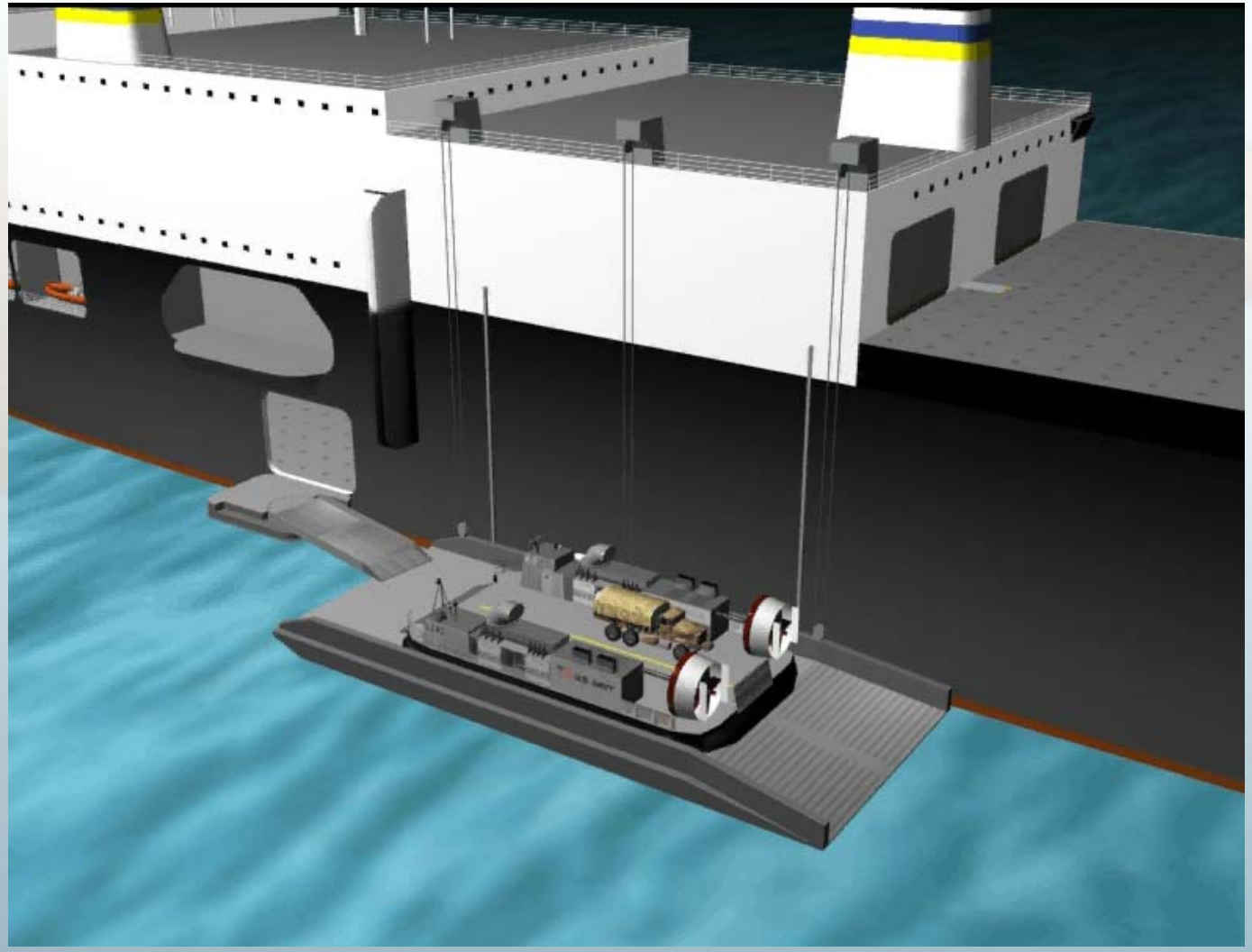
** Team Lead			

Glossary

JILWG	Joint Intermodal Logistics Working Group
AIT SG	Automatic Identification Tracking Steering Group
NavOpLog	Naval Operational Logistics
APM	Acquisition Program Manager
SDM	Ship Design Manager
MHE	Material Handling Equipment
PHST	Packaging, Handling, Stowage and Transportation
NTCSS	Naval Tactical Command Support System
FNC	Future Naval Capabilities

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