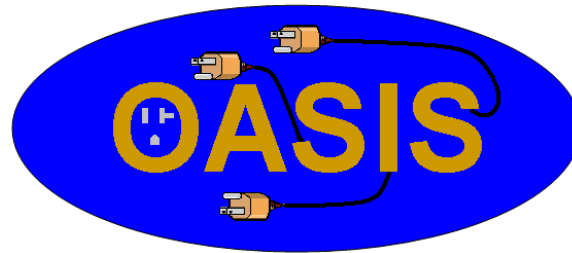


Open Architecture Ship Interface Standards

NSRP Panel Meeting
New Orleans, LA
December 9, 2009

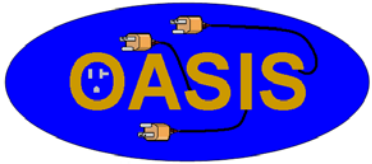
OASIS Team



Participants

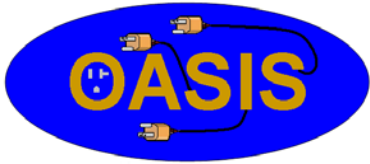


- **PEO Ships / Subs / Carriers**
- **PEO C4I**
- **PEO LMW**
- **PEO IWS**
- **NAVSEA 05**
- **SPAWAR Charleston**
- **NSWC Carderock & Dahlgren**
- **NUWC**
- **NGSB Gulf Coast and Newport News**
- **General Dynamics (Bath Iron Works & EB)**
- **VT Halter**
- **Bollinger**



Task Statement Overview

- Establish and provide support for an OASIS IPT
- Develop a Roadmap and Implementation Plan for achieving cross-platform C4I interface standards (Hardware focused)
- Conduct site visits to gather best practices from within and outside the shipbuilding industry

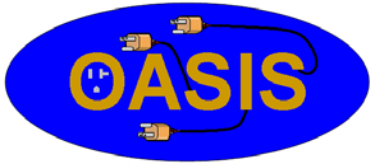


OASIS



Purpose & Goals

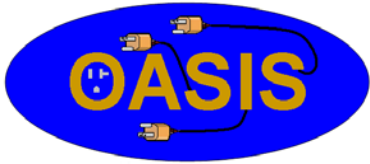
- Currently, a significant portion of the cost of a C4I upgrade goes to HM&E modification
 - High change areas are Foundations, Electrical & HVAC
- The OASIS Team is working to create a process that mitigates the cost/schedule risk of C4I equipment installations and modernizations
- Goals:
 - Reduce cost of mission system ship modernization (ship changes, not new equipment)
 - Identify boundaries and interfaces between ship and mission systems
 - Enable more rapid technology refresh and insertion (including commercial equipment) to provide latest capabilities to the warfighter



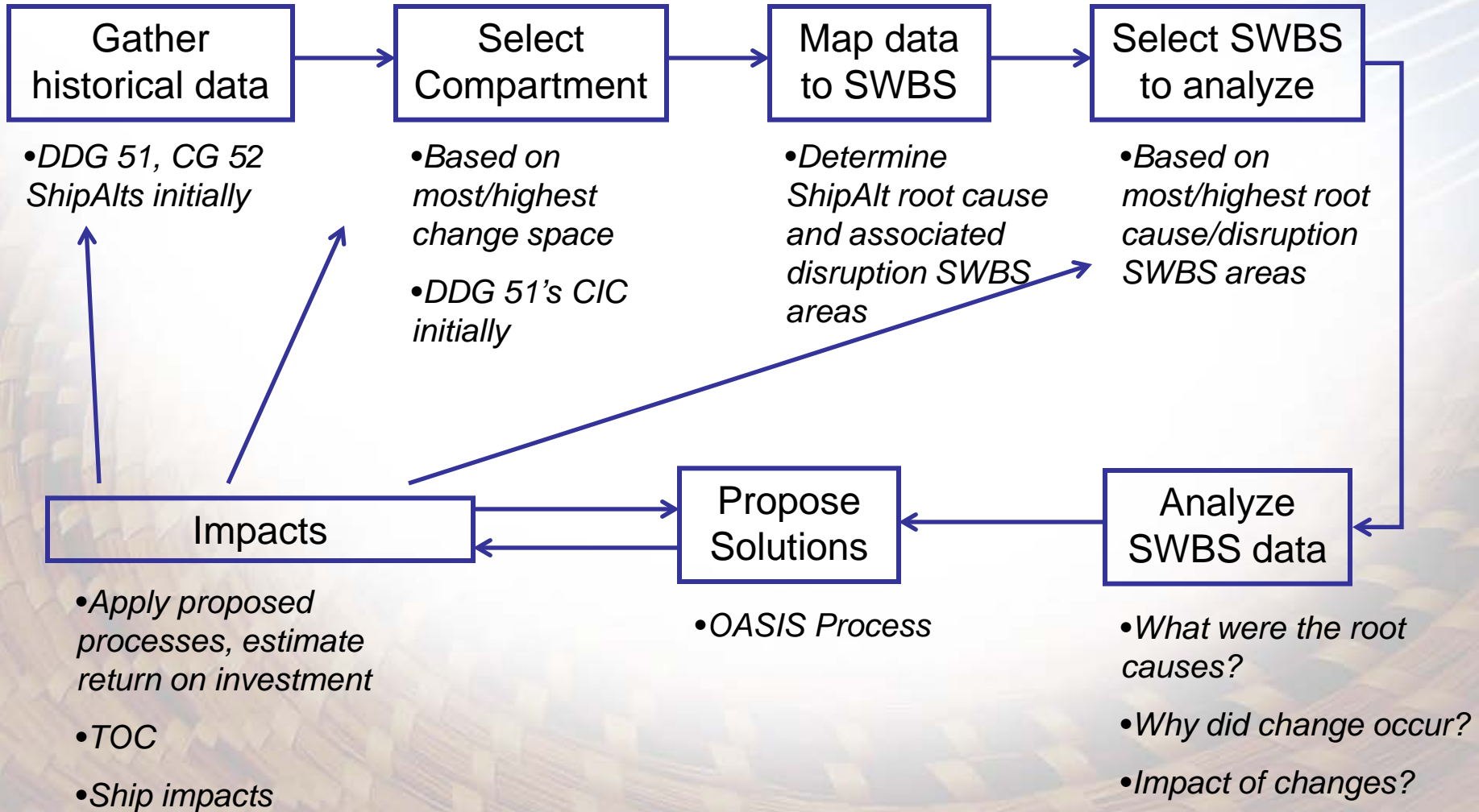
What We've Done So Far



- Brainstormed at length on the problem (it's larger than you think)
 - Shipbuilder perspective
 - Government perspective
- Researched current efforts and processes in physical modularity and standard interfaces
- Conducted site visits to view best practices
- Developed an iterative methodology that addresses the OASIS purpose and goals
- Held two meetings with System Integrators/Equipment Suppliers (via AFCEA) to receive their feedback

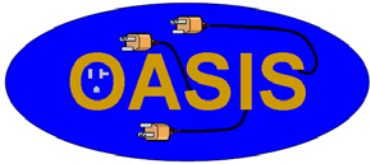


OASIS Methodology



ShipAlt Analysis

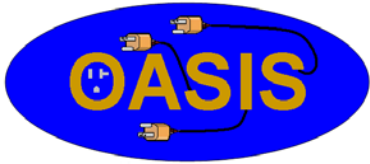
- Looked at ShipAlts in CIC
 - DDG51, CG and CG52
- Majority of Root Causes were the installation of new technology or update of outdated electronics.
- Root Cause SWBS centered in the 400 series – Command and Control.
- Disruption SWBS is mostly the major interfaces: foundations, electrical, cooling, and paint/insulation/deck covering.



Current Efforts



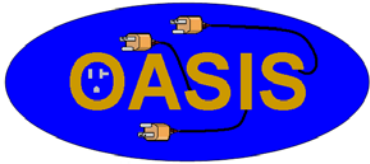
- Flexible Infrastructure (CVN/AIMS)
 - Raised floor with track system for equipment mounting
 - HVAC fed from special floor grates
 - Cabling can be run below deck as well
- Design Budget Process
 - Just-in-time GFI process with shipyard/govt installation responsibilities delineated
- Structurally Integrated Enclosure w/ Hotel Services Working Group (VCS)
 - Enclosure framework that is integral to ship's hull
 - Supports cabinet or workstation build
 - Boundary system between PARMs and SY actively managed



Current Efforts



- Common Display/Processor System
 - Standardized cabinet/workstation modules designed to be open architecture compliant
 - Workstation has 5 configurations
- AIMS
 - Modularity and Open Systems Architecture development for physical systems and applications
 - Technology and solution development to achieve cost avoidance throughout life cycle
 - Total ship design and life cycle impact determination

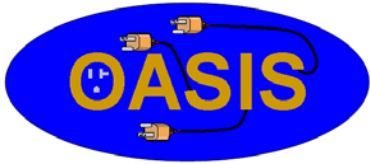


Proposed OASIS Roadmap



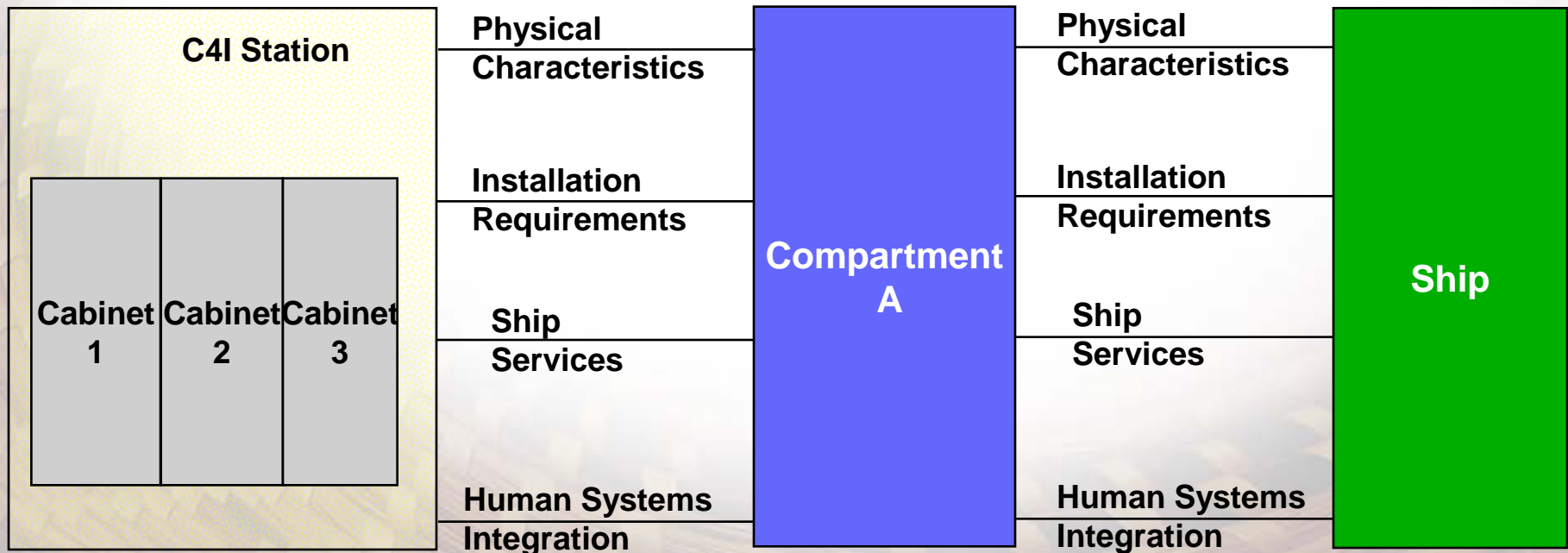
- The IPT is recommending the development and maintenance of a process that will...
 - Early in a ship class lifecycle, define and actively manage HM&E boundaries between a ship and its mission systems
 - Be supported by a phased GFI delivery plan
 - Be governed by a body comprised of shipyard, government and equipment supplier/integrator
 - Be scalable and flexible to allow expansion to other areas of a single shipbuilding program, or across multiple programs

[Proposed Outline Format](#)



OASIS Boundary Concept

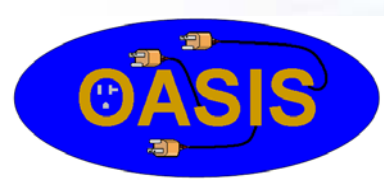
- Boundary provides:
 - A clear **division of responsibility** between the shipbuilder and the system supplier.
 - A **location** for possible standard interfaces between ship and system





- **Physical Characteristics**
 - Weight & CG
 - KG
 - Dimensional characteristics
 - Location
 - Access

- **Installation Characteristics**
 - Time to install
 - Securing/foundations
 - Cabling
 - Physical security
 - Clearance/access
 - Safety
 - Grounding & bonding
 - RF & EMI
 - Shock & Vibration



Boundary Interface Examples



- **Services**

- Electrical power
- HVAC
- Cooling water
- Cooling air
- Input/output (data, voice, video)
- Structural Support

- **Human Factors Engineering**

- Operations
- Maintenance

Design Budget Overview

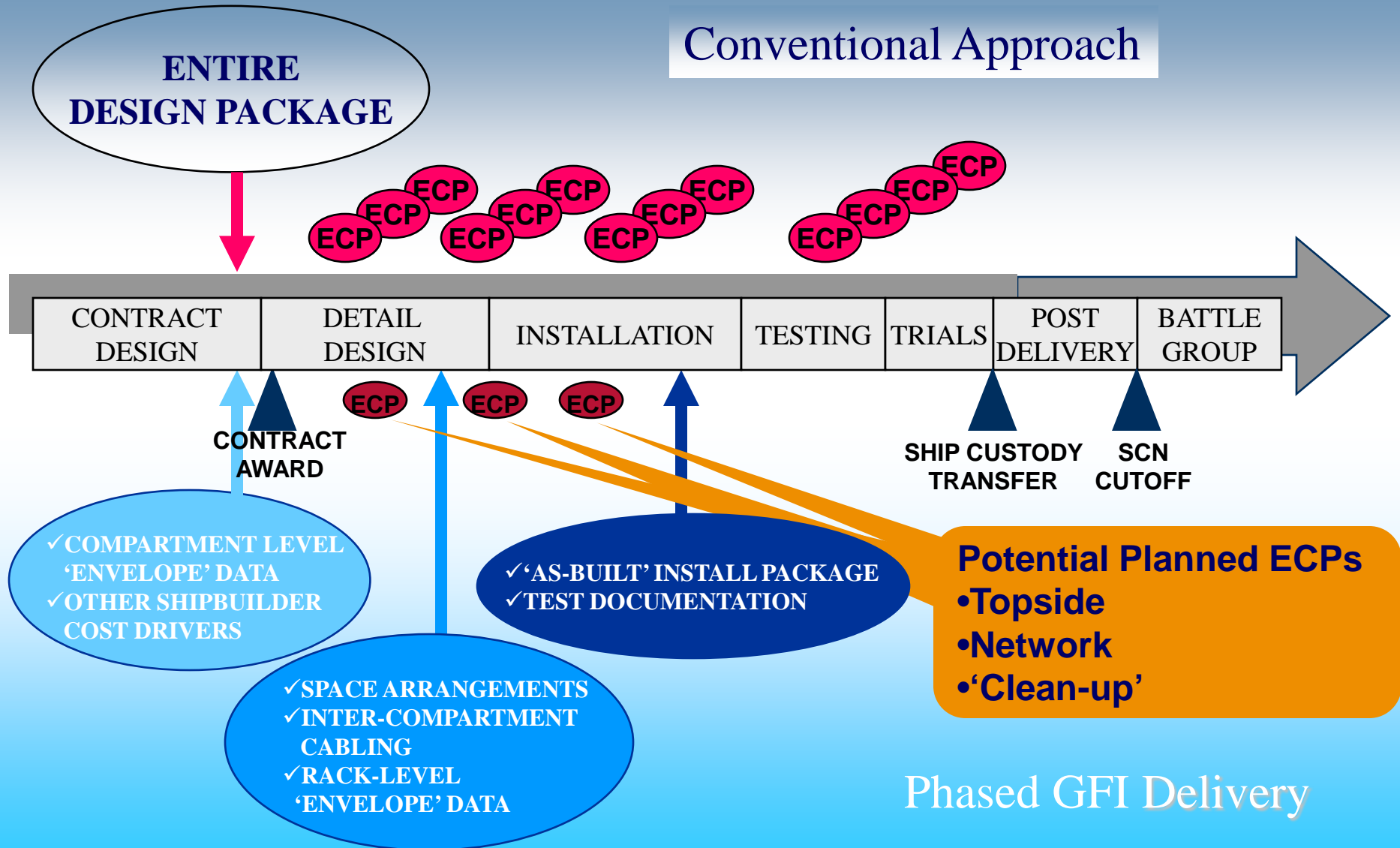
SCN integration process that allows C4I baseline to evolve **transparently to the shipbuilder**. Detailed information is phased to allow maximum flexibility for delivering the latest systems

▼ Design Budget Components:

- Phased GFI Deliveries
- 'Just in Time' GFE Deliveries
- C4I Test and Integration Facility (TIF)
 - Turnkey
 - Modified Turnkey
- Verbiage in Shipbuilding Contract

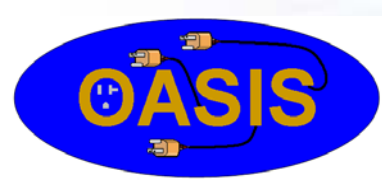
C4I transforming into manageable and agile efforts to enable rapid development and fielding

Phased GFI/GFE Design Budget vs Conventional





- **IPT's final meeting is right now in Charleston, SC**
 - Team is smoothing the Roadmap
- **Roadmap will be submitted to ECB for review and endorsement**
- **Roadmap is intended to be a public document and will be available for review after December.**



Points of Contact



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