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Integrated T&E Process and Tools in a Joint Services Acquisition Program

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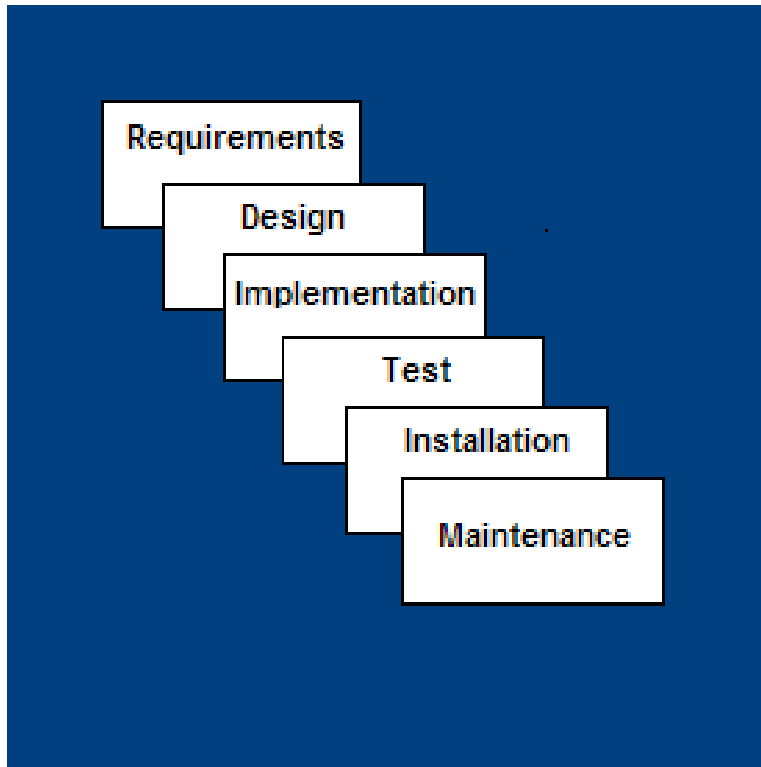


Integrated T&E in a Joint Program

- Integrated Test & Evaluation (T&E) provides an integral part of the Systems Engineering Process, identifying levels of performance, assisting developers in identifying and correcting deficiencies, and validating to the system owner that performance requirements are met in a cost efficient manner. Historically, developmental T&E activities conducted by the Program Office have been fire-walled from the operational T&E activities and organizations.
- Joint Naval Platform acquisition programs have the additional constraints of supporting the needs and requirements of potentially three varied customer groups, such as the U.S. Army, The U.S. Marines, and the U.S. Navy. As the lead Program Office, NAVSEA has led the development of processes and tools that meet the various programmatic needs and potentially provide a cost savings by the use of an Integrated T&E environment.
- This presentation will discuss some of the lessons learned and an oversight into the methodology and tools used in a program that is a model for future joint programs to provide a cost-effective interface between the Requirements Engineering, and the Developmental T&E and Operation T&E communities.



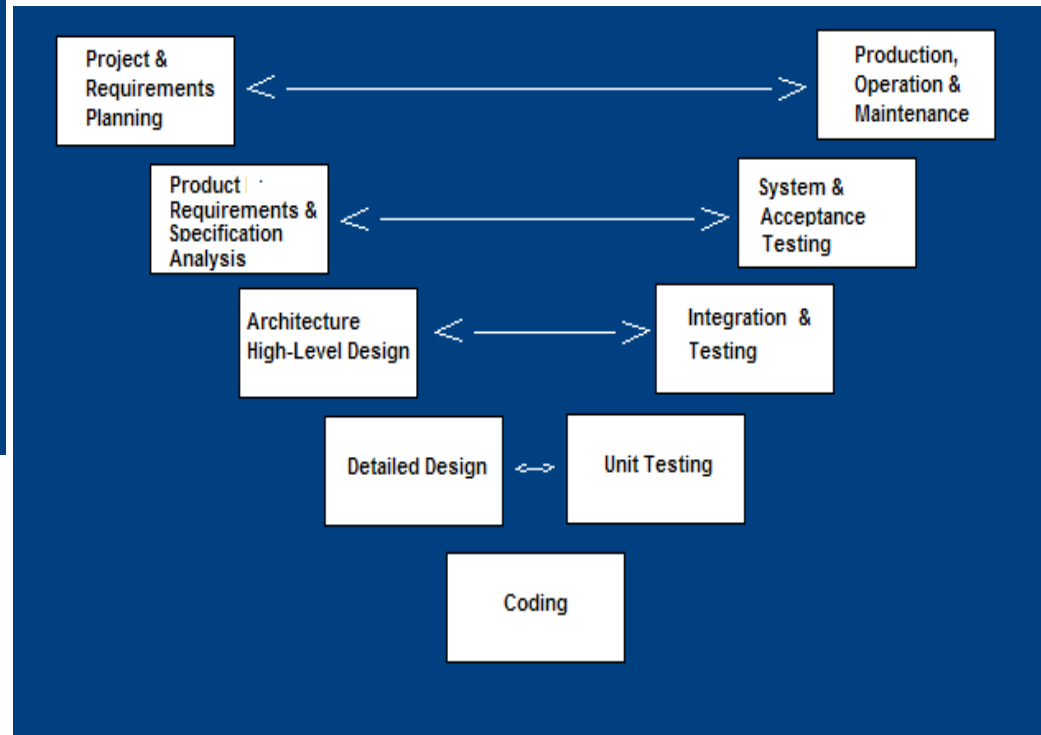
The Technical Process



Other Life Cycle examples:

- Evolutionary
- Incremental
- Spiral
- Agile

Standard Waterfall and V-Model Life Cycles





Verification and Validation

- INCOSE Handbook 3.1
 - Verification -
 - “confirmation, through the provision of objective evidence, that specified requirements have been fulfilled [ISO 9000: 2000]”.
 - “The purpose of the Verification Process is to confirm that all requirements are fulfilled by the system elements and eventual system-of-interest, i.e. that the system has been built right. This process establishes the procedure for taking remedial actions in the event of non-conformance.” [Section 4.7]
 - Validation –
 - “confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled [ISO 9000: 2000]”.
 - “The purpose of the Validation Process is to confirm that the realized system complies with the stakeholder requirements. System validation is subject to approval by the project authority and key stakeholders. This process is invoked during the Stakeholders requirements Definition Process to confirm that the requirements properly reflect the stakeholder needs and to establish validation criteria, i.e. that the right system has been built.” [Section 4.9]



ICD, CDD, and CPD

- Initial Capabilities Document (ICD)
 - Identifies a capability gap or other deficiency
 - Describes evaluation of approaches
 - Supports AoA, Concept Refinement and Milestone A
 - Not normally updated once approved
- Capability Development Document (CDD)
 - Identifies operational performance attributes of proposed system
 - System specific, applies to single increment (in an evolutionary program)
 - Results from Technology Development and supports Milestone B
 - Updated or rewritten for subsequent increments
- Capability Production Document (CPD)
 - Identifies production attributes for a single increment of a program
 - Prepared during System Development and Demonstration
 - Rewritten for each increment in a evolutionary program



Joint Acquisition for Naval Platforms

- While many know of the U.S. Navy combatant and non-combatant fleet and of the Coast Guard fleet, most do not know the U.S. Army maintains it's own fleet of littoral non-combatant vessels.





Joint High Speed Vessel Prototypes

- The U.S. Army and U.S. Navy have been very successful testing converted high speed ferries as non-combatant vessels.



- Currently the Navy, Army, and Marines are jointly acquiring a production Joint High Speed Vessel.
- NAVSEA is the lead acquisition organization.



Joint Stakeholders

- The T&E W-IPT developed to represent all the major stakeholders.
- Stakeholders include:
 - Program Executive Office, Ships (PEO SHIPS)
 - NAVSEA Ship Design Manager (SEA 05D3)
 - Commander, Operational Test and Evaluation Force (COMOPTEVFOR)
 - Army Test and Evaluation Command (ATEC)
 - Marine Corps Test and Evaluation Activity (MCOTEA)
 - Chief of Naval Operations, Expeditionary Warfare (OPNAV N85)
 - Chief of Naval Operations, Navy Test and Evaluation Division (OPNAV N912)
 - Deputy Assistant Secretary of the Navy (DASN(Ships))
 - Army Test & Evaluation Executive
 - U.S. Army Test and Evaluation Management Agency (TEMA)
 - Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology) (OASA(ALT))
 - Office of the Secretary of Defense, Director, Operational Test and Evaluation (OSD/DOT&E)
 - Office of the Under Secretary of Defense (Acquisition, Technology and Logistics), System and Software Engineering/Assessments & Support (OUSD(AT&L)/SSES/AS)

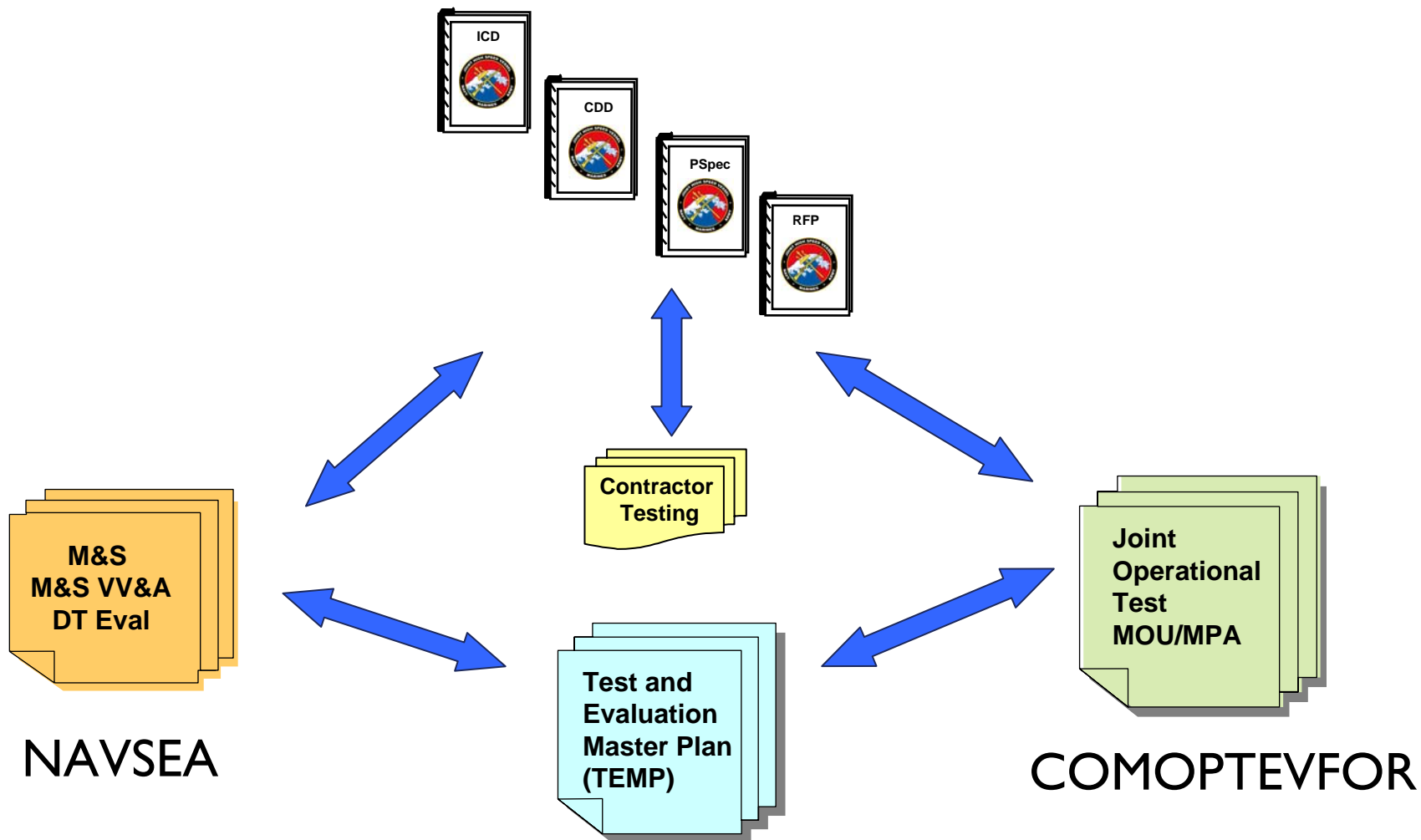


Joint Requirements

- The Army, Navy, and Marines formed an IPT to develop the Analysis of Alternatives (AoA), Initial Capabilities Document (ICD), and Capability Development Document (CDD) IAW Joint Capabilities Integration and Development System (CJCSI 3710.01).
- NAVSEA coordinated the development and adjudication of the AoA, ICD, and CDD, including the Key Performance Parameters (KPP).
- With it's background of deepwater non-combatant ship design, NAVSEA took the lead in the development of the platform Performance Specification (PSpec (CPD)) and coordinated adjudication through the Joint IPT.

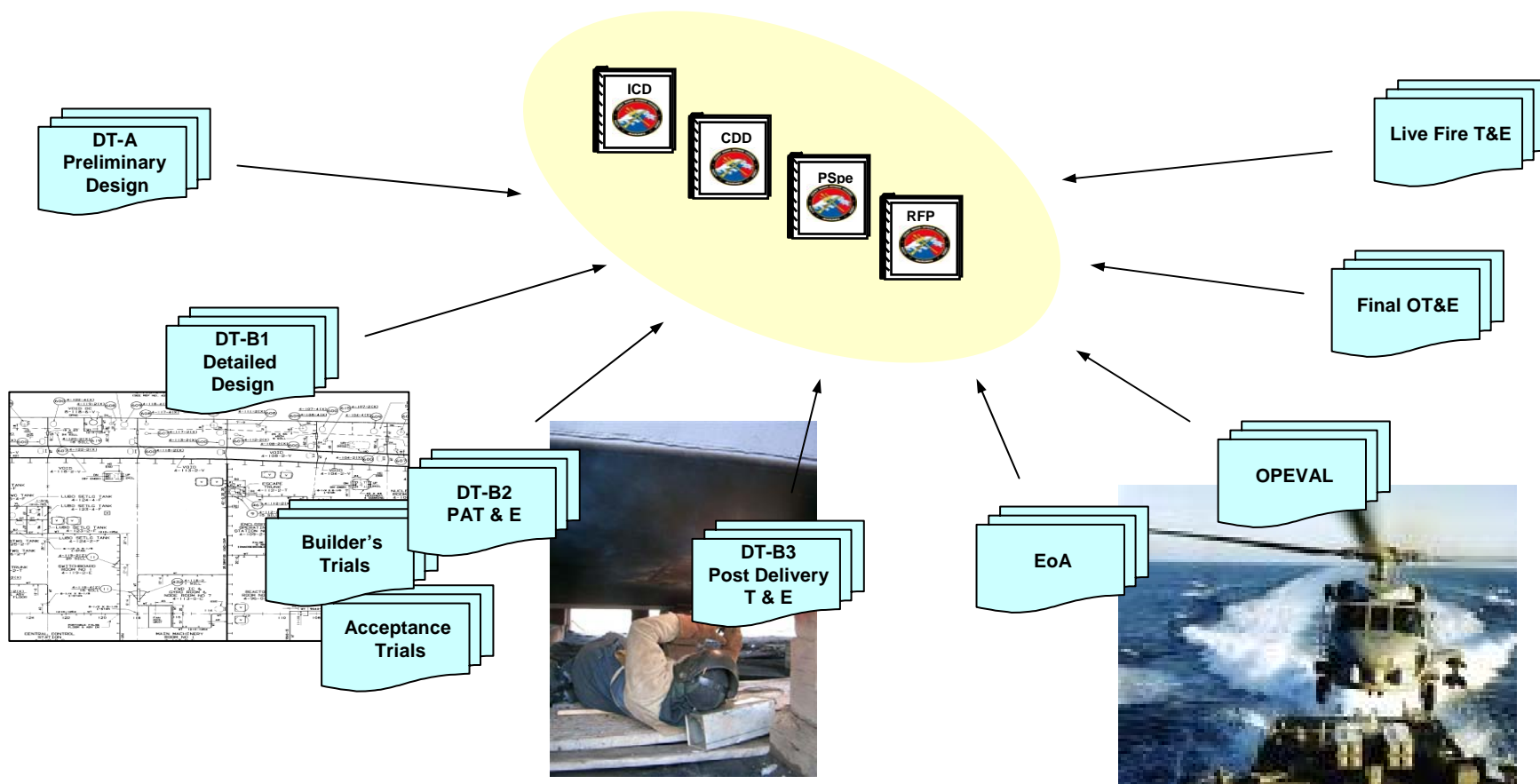


Verification & Validation Traceability





Integrated Test Phases



Supports Staged T&E Approach through Acquisition Lifecycle

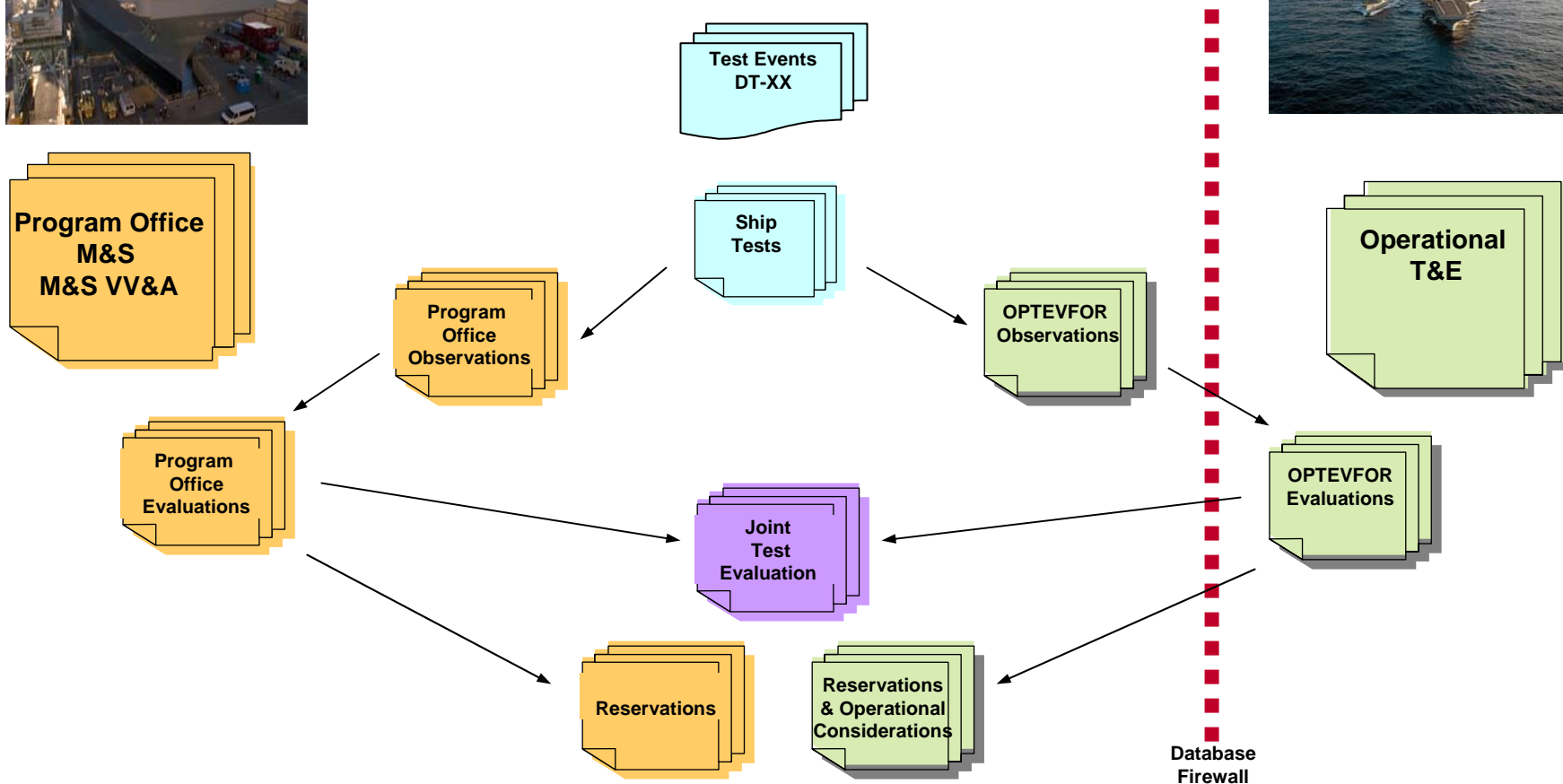


MOE/MOSs, CTPs and COIs

- Requirements module and T&E modules linked by various categories of measures.
- Developmental T&E test events linked to PSpec via Critical Technical Parameters (CTP).
- Operational T&E test events linked to CDD via Measures of Effectiveness and Suitability (MOE/MOS).
- Additional concerns in regards to survivability features and Live Fire Test & Evaluation Issues



Web-Enabled Integrated Test Evaluation Tool



Provides for Independent Evaluation



SMARTT[®] Alion's Web-enabled Integrated Requirements Management and T&E Database

- Integrated program developed by Alion and currently used in a variety of internal and external naval acquisition programs.

JHSV - Joint High Speed Vessel Internet
SMARTT Database
 (Simplified Management & Analysis of Requirements Traceability & Testing)

Select Search Criteria
 Requirement Management Menu
 Select Requirement Type
 Requirement Search
 Test And Evaluation Menu
 Select Test Period
 Test And Evaluation
 Reports
 Select Category
 Reports

JHSV - Joint High Speed Vessel Internet
SMARTT Database
PSpec Search Results
 (Simplified Management & Analysis of Requirements Traceability & Testing)

Your search returned 1819 records

CDD ID	CDD Requirement	CDG Member
CDD-1	Test in	Priority Level: Army Navy Marine
CDD-2	The vessel will operate in ambient air temperatures of 32°F to 122°F for operations in cold climates similar to winter from the Persian Gulf region.	Priority Level: Army Navy Marine
CDD-3	Sea water temperatures of 28°F to 86°F are to be expected at all sea water intakes to correspond to the same regions used for air temperature.	Priority Level: Army Navy Marine
CDD-4	The JHSV will be designed to operate in a range of sea states defined by NATO STANAG 4154 REV3.	Priority Level: Army Navy Marine
CDD-5	The vessel will achieve mission speed at all loadings in 500 ft (152m) wave height, and 80% speed at a head heading in 500 ft (152m) wave height.	Priority Level: Army Navy Marine
CDD-6	The operational sea state envelope for the vessel will be 500 ft (152m) wave height with a capability for head heading at best speed for craft survivability.	Priority Level: Army Navy Marine
CDD-7	The JHSV will be designed to operate with a mixed gender military crew.	Priority Level: Army Navy Marine
CDD-8	The JHSV will be capable of transporting a mixed gender passenger complement.	Priority Level: Army Navy Marine
CDD-9	JHSV will be built in accordance with the ASB High Speed Craft code.	Priority Level: Army Navy Marine

JHSV CDD Universal Joint Task List Requirements

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SHIP SYSTEM PERFORMANCE PARAMETERS
 The vessel will be an intra-theater, medium lift platform utilized for the vessel's primary mission is to deliver and receive FSE, from any theater.

KEY SHIP SYSTEM PERFORMANCE PARAMETERS
 Performance parameters outlined in this specification will be present objective.

ID	Text
3.0501	Transport Capability The vessel shall be capable of transporting 544.31 metric ton (1210,000 lbs) of cargo.
3.0501	Transport Capability The vessel shall be capable of transporting 1200 metric tons (2646,000 lbs) of cargo.
3.0501	Transport Capability This transport capability requirement must be obtained without reference to the vessel's primary mission.
3.0502	Amtrac Port Access The vessel shall be capable of operating in shallow-draft ports and rivers.
3.0502	Amtrac Port Access The full load navigational draft shall be less than 4.57 m (15.0 ft).

Start Date YYYYMMDD 218841418
 Stop Date YYYYMMDD 2005-12-31
 Cost Estimate 0.00
 Actual Cost 0.00
 Resources Resources undefined
 Risk Title
 Risk ID G
 Verification Method MSG
 Severity 1
 Likelihood 1
 Summary G
 Status (3 MSG)
 Location Select Location Type
 Support Test Agency COW M584
 Test Plan Location
 Test Report Report to IIC location
 Evaluation Report Report to IIC location
 Evaluation Report Approved Select
 Applicable MOEMO 5

Provides Virtual Team Direct Editing and Management of Data



Questions or comments can be forwarded to:

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