Affordable Readiness

Linking Resources to Readiness throughout the Life Cycle

“Sea Power to the Hands of Our Sailors”

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Affordable Readiness Perspective

■ Readiness is a **critical, dominant element** of the overall capability a system provides. It determines the real and sustainable capability that system users can realistically achieve in an operational environment **within planned resource levels**

■ **“Re-establish Readiness as a Priority:”** The creation of combat ready forces must take equal footing with meeting the immediate demands of Combatant Commanders….**” – 2017 Strategic Readiness Review**

NAVSEA is Taking a Systems Engineering Approach to Providing the People, Process, and Tools to Enable Affordable Readiness
Affordable Readiness

- Modeling and Simulation used extensively in PEO Integrated Warfare System (IWS) new programs to ensure affordable readiness is designed in:
  - Air and Missile Defense Radar (AMDR) (ACAT-IC)
  - Enterprise Air Surveillance Radar (EASR) (non-ACAT)
  - Directed Energy (DE) Programs (Rapid Acquisition)

- System models drive, align, and validate system designs and Product Support Strategies
Current Applications

- Develop, analyze, and justify Sustainment Key Performance Parameters (KPPs) and Key System Attributes (KSAs) prior to prototyping and formal design efforts

- Continuously analyze and assess design compliance with Sustainment Key Performance Parameters (KPPs) and Key System Attributes (KSAs)
  - Operational Availability ($A_o$)
  - Probability of Successful Mission ($P_{sm}$) – Material Reliability
  - Operating and Support (O&S) cost

- Requirement to use the same “model” incorporated into new contracts and required as a contract deliverable throughout the Systems Engineering process
  - Government validates/verifies model deliveries

- Feed the program’s Life Cycle Cost Estimate such that O&S costs in the estimate are inextricably linked to the program’s readiness (availability) requirement
Current Applications

- Assess O&S budget cut impacts on readiness
- Model metrics and associated costs for PBL contracts and organic arrangements
  - Evaluate contract cost and ensure contract performance metrics support the system availability requirement
  - Structure contract strategies around risk, reliability, availability, maintainability, and cost drivers resulting from M&S effort
- Provide fleet decision support capability for fielded systems
  - Model is dynamic – can support continuous optimization of support solutions for rapidly changing and complex combat conditions
Capabilities / Model Description

- Based on a model of the system design / Technical Data Package (TDP), supportability analysis, and the product support strategy
  - All Lowest Replaceable Units (LRUs) and components to model all system failure modes
  - Integrated with (and a natural part of) classic “supportability analysis”
    - FMECA, LORA, Reliability Predictions, MTA, RCM, etc.
  - Built on a complex Reliability Block Diagram (RBD) to account for complex redundancy strings and unique maintenance capabilities (hot swap, etc.)
  - Supply chain nodes and support provider selections (depots, forward supply points, ships, etc.) with associated performance levels (turn around times, transportation times, etc.)
  - Accounts for system population and associated Operational Tempo
  - Phases in planned reliability growth across production systems
Model Outputs

- Outputs optimized support solutions to meet a particular availability or mission reliability requirement
  - Wholesale and retail spares (multi-echelon Readiness Based Sparing)
  - Optimized manpower for maintenance
  - Optimized organizational, intermediate, and depot level repair cycles
  - Optimized Operating and Support (O&S) cost
Model and Analysis is the Basis of the Business Approach (PBL) to Affordable Readiness

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NAVSEA Enterprise Path Forward

- SEA06L is responsible for NAVSEA’s Product Support Policy, Information Technology (IT), and Competency
- As part of OPNAV N4 Digital Transformation effort, SEA06L is transitioning its legacy Product Support IT Systems to a modern Product Lifecycle Management (PLM) environment
  - Focused on providing the technologies necessary to **increase weapon system readiness** and reduce Total Ownership Cost (TOC)
  - Leverages modern commercial technologies / open data standards and aligns NAVSEA’s business processes to industry practices to reduce infrastructure, software, and cyber costs
  - Works towards a joint SYSCOM solution

Building on Best of Breed Work from PEO IWS to Establish Enterprise Solution for Affordable Readiness
Affordable Readiness Enablers

**Human Capital**
- Reshape the product support career field technical competencies

**Technology**
- Implement digital transformation through Navy PLM environment

**Policy and Process**
- Adopt technical data standards to enable PLM success
- Adopt common readiness model
- Revamp the SE Process for Readiness
Technology

Future state Product Support IT will differentiate us from our adversaries through enabling **Affordable Readiness**

- Establish digital thread and digital twin with models and data developed during design and extending them into an enterprise decision support capability for fleet readiness
  - Makes Supportability Analysis a continuous optimization from requirements through disposal

- Through system and data integration, never lose the connection between resources (cost) and readiness to support high fidelity decision making

- Enable rapid fielding of capability and associated “rapid support” through increasing digital data integration and process efficiencies
Systems Engineering Process and Policy

- Requirement for a common Readiness Model at system, System of Systems (SoS) level from requirements through disposal
  - Built on supportability analysis foundation
- Implement modifications to the Systems Engineering Technical Review (SETR) process to ensure readiness and fielding risk are an integral part of it
- Implementation of common standards for the acquisition of product and technical data to support both acquisition and sustainment functions
  - Aligns data procurement to ensure success of future IT systems that are standards-based
Human Capital

- Focus on engineering, business, and mathematics competencies for the future Product Support workforce
  - Advanced analytics and new technologies require technical skill sets that are not currently part of the Product Support workforce
- Deploy training to the new and existing workforce to address new technologies and future analytics skill sets
- Work towards a positive degree requirement for the workforce that is responsible for the majority of the Life Cycle Cost of a weapon system ….