Model Based Product Support (MBPS)

General Overview

SEA06L 06/30/2020
OPNAV Engineering Technical Reference Framework (ETRF) Vision

**MISSION OUTCOMES**
- Reduced failure rate
- Improved repair time
- Improved outfitting and resupply time and accuracy
- Affordable sustainment
- Mission capable and secure facilities
- Reliable installation operations
- Safeguard personnel performing Operations and Maintenance

**CAPABILITIES**
- Planning
- Design Integration
- Program Management
- Data Management
- Job Support
- Procurement
- Order Fulfilment
- Transportation
- Manufacturing Management
- Maintenance Identification
- Maintenance Scheduling
- Maintenance Execution
- Maintenance Completion
- Operations Support
- Facilities Support
- Installations Support

230 systems
1,600 applications
1,000s of data sources

**OPERATIONAL**
- Supply Chain Management
- Maintenance, Repair, & Overhaul

**INDUSTRIAL**
- Support
- Data Platform Technology

**Shore Maintenance of Ships**
1. NMMES – Navy Maritime Maintenance Enterprise Solution: N97, NAVSEA 04
2. NMMES-TR – NMMES Technical Refresh: N97, NAVSEA 04 / PEO(EIS) PMS-444

**Naval Aviation Enterprise**
3. SV 2020 – Sustainment Vision 2020: N89/MYCF, NAVAIR 6.0/COMFRC
4. MBPS – Model-Based Product Support: N96, NAVSEA 05L

**Operational Forces**
- AIR, SURFACE, SUB, NECC, CYBER
  5. NAMS – Naval Aviation Maintenance System: N41, PEO(C4I) PMW-150
  6. NOSS – Navy Operational Supply System: N41, PEO(C4I) PMW-150
  7. NORE – Navy Operational Repair Environment: N41, PEO(C4I) PMW-150
  8. CBM+ ES – Condition-Based Maintenance Plus: Enterprise Solution: N96, NAVSEA 05

**Finance & Supply Chain Management**

**Facilities & Installations Operations**
- Readiness Ashore Strategy
# Logistics Digital Transformation POAM

## Data Analytics / Digital Platform
**AWARE**
*Agile Warfighter Analytics Readiness Environment*
- RS: N41
- PMO: PEO(C4I) PMW-150

## Operational Forces Supply & Maintenance
**NOBLE**
*Naval Operational Business Logistics Enterprise*
- RS: N41
- PMO: PEO(C4I) PMW-150

## Maritime Weapon Models & Support
**MBPS**
*Model-Based Product Support CBM+ Enterprise Solution*
*Condition-Based Maintenance Plus ES*
- RS: N96
- PMO: SEA 06 SEA 05

## Shore Maintenance of Ships
**NMMES**
*Navy Maritime Maintenance Enterprise Solution*
**NMMES-TR**
*NMMES Tech Refresh*
- RS: N97
- PMO: SEA 04 SEA 04/PEO(EIS) PMS-444

## Aviation Sustainment
**Aviation Digital Sust**
- RS: N98
- PMO: PEO CS

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**Legend:**
- Blue: Contract
- Yellow: IOC
- Green: FOC

**CONTINUOUS DEPLOYMENTS**
The Navy’s current logistics data systems that provide configuration management, provisioning, readiness modeling and technical data management support for ships and weapon systems are outdated.

These systems are at the end of their useful life, are no longer supportable. Combined with unacceptable sustainment costs, cyber vulnerabilities, software obsolescence, rapidly changing/emerging technologies, lack of common data standards and interfaces, and outdated business processes, it greatly inhibits the ability to effectively and cohesively perform supply and maintenance functions.

Increasing weapon system uptime while reducing support costs requires a Digital Transformation of NAVSEA Logistics.
Current and Future State

- MBPS supports IT Replacement effort to modernize NAVSEA’s provide configuration management, provisioning, readiness modeling and technical data management Logistics IT systems to enable the advanced warfighter readiness capabilities.

- MBPS represents a seismic shift in the way the entire NAVSEA workforce will execute the processes necessary to sustain ships and submarines.

CTD funding line supports current in-service capabilities in addition to technology refresh (MBPS) efforts.
MBPS Digital Transformation (BCAT II)

MBPS is a Business Capability Acquisition Category Level II (BCAT II) currently in Phase 1 with Phase 2 completion expected by the end of prototype development period during Q2 FY21.

SEA06L is executing an Other Transaction Authority (OTA) to initiate an incremental approach for prototype development.

MBPS is executing an OTA Prototype Acquisition approach targeted to deliver operational capabilities in FY21.
MBPS Capability Overview

Navy Product Data Management (NPDM):
- Configuration manage, sustain, and provide enterprise access to all components of legacy and future standards-based Navy Weapon System Technical Data Packages (TDP)

Navy Common Readiness Model (NCRM)
- Analyze, report, predict, and optimize weapon system readiness and O&S cost throughout the life cycle

Navy Data Acquisition Requirements Tool (NDART)
- Common data standards, requirements and acquisition approaches to procure technical and product data

MBPS is comprised of three primary capabilities providing enterprise product data and readiness analytic services
MBPS will replace critical systems and applications. Other maritime logistics IT systems may be replaced as part of the future state.
## MBPS (BCAT II) Program Schedule

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<th>FY20 Q1</th>
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<th>FY21 Q1</th>
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FY21 legacy system concurrent operation and/or replacement schedule still in progress with MBPS vendor (Accenture)

- Aligning to capability maturity from MVP-1 and current MVP-2 progress
- Systems will not be shut down until end user training is executed and data V&V occurs
- Legacy systems availability planned for several months after transition to the MBPS environment in case fail-over is required
- CDMD-OA planned as the first legacy system to sunset (highest $, foundational functionality)

Training deployment schedule being developed in concert with legacy system replacement schedule

- Training development occurring in parallel to MVP software configuration
- Training execution contract awarded April 2020
The Navy maritime Model Based Product Support (MBPS) program will increase weapon system uptime and reduce support costs by providing:

- A decision support capability to relate resources ($) to readiness
- A maintenance and supply resource optimization model to dynamically meet mission readiness requirements
- Management and delivery of accurate, integrated, and modern 3D product data necessary to execute maintenance and supply actions on ships and submarines
- Common standards, requirements, and acquisition approaches for product and technical data

MBPS is a Program of Record (PoR) with a Business Capability Acquisition Category (BCAT) II designation. It is comprised of 3 primary capabilities: Navy Common Readiness Model (NCRM), Navy Product Data Management (NPDM), and Navy Data Acquisition Requirements Tool (NDART).

### MBPS to Legacy Systems Alignment

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### MBPS Will Replace Critical Systems/Applications

Other maritime logistics IT systems may be replaced as part of the future state.

### MBPS to Legacy Systems Alignment

1. **System Shipboard Config Status**
   - CDMD-OA, RADWEB
2. **Configuration Mgmt & Modernization**
   - NDE
3. **Provisioning Parts Information**
   - ICAPS
4. **Ship & Shore Tech Data Viewing**
   - ATIS
5. **Ship Drawings**
   - NEDR
6. **Org & Depot Maint Procedures**
   - TDMIS, NAVLOGTD, PMSMIS
7. **Readiness/Mission Models**
   - NMMAT, MRDB, RBS
8. **Tech Data Contract Requirements**
   - SMART-T

### Sea06L Mission

**Advocate and deliver superior Product Support through people, processes, and technologies to enable affordable Fleet readiness**

### FOR MORE INFORMATION

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Mil-STD-31000 Technical Data Package (TDP) (includes but is not limited to):
- 3-D Models
- Drawings
- Associated Lists
- Specifications
- Standards
- Quality Assurance Provisions
- Software Documentation
- Packaging Details

Mil-STD-31000
- 3-D Models
- Drawings
- Associated Lists

S3000L and S4000P
- Logistic Support Analysis (LSA)
- Maintenance Concept
- Corrective Maintenance Tasks
- Preventive Maintenance Tasks
- Maintenance Task Analysis and Planning
- Operational Tasks
- Human Factor Analysis
- Spares
- Tooling

S1000D
- Illustrated Parts Data
- Data Modules
  - Maintenance and Operation
  - Descriptions
  - Procedures
  - Troubleshooting
  - Training Modules

S2000M
- Initial Provisioning Lists
- Illustrated Parts Data

S6000T
- Training Needs Analysis
- Training Objectives

Product Model Data - Specifications
IT Systems in MBPS Baseline

SEA06L IT Systems under Command Tech Data (CTD) funding line included in FY20 MBPS Baseline:
- 1. Configuration Data Manager’s Database – Open Architecture (CDMD-OA)
- 2. Revised Alternative Dataflow WEB (RADWEB)
- 3. Advanced Technical Information Support (ATIS)
- 4. Naval Ships Engineering Drawing Repository (NSEDR)
- 6. Streamlined Modular Acquisition Requirements Tailoring Tool (SMART-T)
- 7. Naval Logistics Technical Data (NAVLOG-TD) Repository

Additional applications outside of CTD funding line included in MBPS Baseline:
- 8. Interactive Computer-Aided Provisioning System (ICAPS) – SEA 06L program, N9 Outfitting Account funded (FY 20 Baseline)
- 9. Navy Maintenance Figures of Merit (MFOM) Modeling Analysis Tool (NMMAT) – USFF, USFF funded (FY20 Baseline)
- 10. Material Readiness Database (MRDB) – SEA 21 program, N96 funded (FY21 Baseline)
- 11. Readiness Based Sparing Availability Centered Inventory Model (ACIM) – NAVSUP, Navy Working Capital Funded (FY20 Baseline)

Non-SEA 06 Applications identified for replacement outside of current MBPS baseline:
- 1. Program Support Data (PSD) Automated Reporting and Tracking System (PARTS) – SEA 06L, N9 funded (FY21 Baseline)
- 2. Planned Maintenance System Management Information System (PMS-MIS) – SEA 04RM, N96 funded (FY21 Baseline)
- 3. Navy Data Environment (NDE) – SEA 04RP, N96 funded (FY21 Baseline)
# MVP-1 and MVP-2 Planned Capabilities

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<th>NCRM</th>
<th>Infrastructure</th>
<th>NDART</th>
<th>Enabling/Supporting Capabilities</th>
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<tr>
<td>Document and 3D model management capability for all maritime technical manuals and drawings (Replaces NSEDR and TDMIS)</td>
<td>Predictive Availability and Operations and Support (O&amp;S) Cost model and simulation capability configured for systems, ships/subs, and strike groups (dependent on model availability)</td>
<td>Unclass (IL4), UNNPI (IL5) Authority to Operate for MVP-1 and MVP-2 Capabilities</td>
<td>SOW, CDRL, and DID output capability for acquisition programs</td>
<td>Training analysis and content developed and ready for delivery for all MBPS deployed capabilities</td>
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<td>Shore viewing capability for all formats of maritime 3D models, drawings, and technical manuals including S1000D (Replaces ATIS ashore)</td>
<td>Readiness Kill Chain capability</td>
<td>Legacy interfaces maintained and tested (ERP, OMMS-NG, R-Supply, REMAD)</td>
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<td>Vendor required cyber testing completed for all MBPS deployed capabilities</td>
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<tr>
<td>Configuration Status Accounting (CSA) capability for all communities currently utilizing CDMD-OA (Replaces CDMD-0A)</td>
<td>Failure Modes, Effects, and Criticality Analysis (FMECA) capability</td>
<td>Data import and export capability for CDMD-OA and ICAPS data sets implemented in support of distribution to ERP, legacy ICAPS, OMMS-NG, and R-Supply</td>
<td></td>
<td>Full S-Series+ data model configured in NPDM to include mapping of current CDMD-OA and ICAPS data sets to the S-Series data model</td>
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<td>Legacy CDMD-OA and ICAPS data converted into S-Series data model within MBPS</td>
<td>Reliability Centered Maintenance (RCM) analysis capability in compliance with MIL-STD-3043A</td>
<td>Data export capability for configuration-based technical publications</td>
<td></td>
<td>All CDMD-OA and ICAPS/ERP data sets moved to NPDM with configuration management capability implemented to support</td>
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<tr>
<td>Support of S-Series+ including S2000 (Provisioning), S3000 (Logistics Support Analysis), and S4000 (Preventive Maintenance) data standards for new programs. Near term stand alone S1000D authoring capability (NAVLOGTD). (Replaces ICAPS)</td>
<td>Multi-Echelon Multi-Indenture Readiness Based Sparing (RBS) (Replaces TIGER/ACIM)</td>
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<tr>
<td>Support of S-Series+ including S2000 (Provisioning), S3000 (Logistics Support Analysis), and S4000 (Preventive Maintenance) data standards for new programs. Near term stand alone S1000D authoring capability (NAVLOGTD). (Replaces ICAPS)</td>
<td>Relevance Block Diagram (RBD) development and configuration management capability (Replaces portion of MRDB)</td>
<td></td>
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<tr>
<td>Model creation capability from S3000L output of NDPM</td>
<td>Level of Repair Analysis (LORA) capability</td>
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<tr>
<td>Fault Tree Analysis (FTA) capability</td>
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</tbody>
</table>
MBPS High-Level Capability Architecture (MVP-1/2)

PTC software: 🐐
Beast Code software: 🐐
Systecon software: 🐐
Summary of Impacts:

- PI-1 Extended User Testing shifts from Sprint 4 to **Sprint 6** to allow development of additional end-user ready functionality
- Start dates for Sprints 2-7 adjusted to account for additional planning activities at start of Sprint 2
- Program Gates 2-5 adjusted to align with new dates for Extended User Testing and Sprints
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NAVSEA Product Support and Logistics Wiki
https://wiki.navsea.navy.mil/display/LOG

MBPS Demo
confluence.di2e.net/download/attachments/502385099/MBPS_LOGCOP_NPDM_DEMO_MAY20.mp4?api=v2
Back-Up
Readiness Review Example

Navy Common Readiness Model Results
Electronic Warfare System (example)

Weapon System $A_o$
Improvement Plan
- Reliability Engineering Change
  - Ao Improvement: .05
  - Cost: $3M
- On-board Spares Change
  - Ao Improvement: .05
  - Cost: $5M
- Resolve Obsolescence
  - Ao Improvement: .03
  - Cost: $2M
- Fault Isolation SW Update
  - Ao Improvement: .03
  - Cost: $500K
- Preposition Spares
  - Ao Improvement: .04
  - Cost: $250K

Cost $
**MBPS Shipboard Maintenance Scenario**

1. Ship CBM+ automatically detects future failure and fault and sends recommendation to NOBLE.
   - **Embedded Fault Detection, Fault Isolation, Fault Codes, and Sensors**

2. System auto generates 2K, which is verified and authorized by the Maintenance Chief.

3. Authorized 2K auto generates parts requisition 90 days prior to failure. Part is received and stowed 30 days prior to failure while maintenance is being scheduled.

4. Sailor can review the specific 3D training content for the repair prior to executing the maintenance action. Sailor can also review maintenance in virtual reality (VR).

5. Maintenance scheduled, part arrives, and sailor conducts maintenance changes; augmented reality (AR) can be enabled from handheld.

6. Program reviews the reported failure against system baseline data to understand root cause, determine if ECP required to change/modernize design to prevent future issues, etc.

7. Update Cloud-based MBPS baseline, initiate changes, etc.

8. Update ship baseline

**MBPS/ETRF**

**Naval Operational Business Logistics Enterprise (NOBLE)**

- Maritime, Aviation and Expeditionary Maintenance and Supply Operations

**NOME**

- NOSS
MBPS Shore Modernization Scenario

1. Serialized maintenance (MTBF, MTTR) Supply (MLDT), Machine Data feedback

2. Analytics IDs out of tolerance MTBF actual to predicted; triggers problem report
   - Propulsion
   - Power Gen
   - Combat Sys
   - Other

3. Government/OEM Logistics Management Specialist
   - Conducts root cause analysis

4. Initiates Engineering Change Request from Problem Report with analysis attached

5a. Updates technical data
   - Government/OEM Engineer

5b. Develops/recommends alternatives and updates MTBF
   - Government/OEM Logistics Management Specialist

5c. Update baseline and configure updated technical data for publishing
   - Government/OEM Logistics Management Specialist

6. Cloud-based MBPS distributes updated serialized technical data (includes mBOM, AM CAD)

7a. NMMES-TR sends AM CAD/instructions to print part

7b. NMMES-TR orders remaining parts and materials from mBOM

8. Once parts are received and job scheduled, NMMES-TR sends MES data and Work Instructions to the shop floor for job completion