Agenda
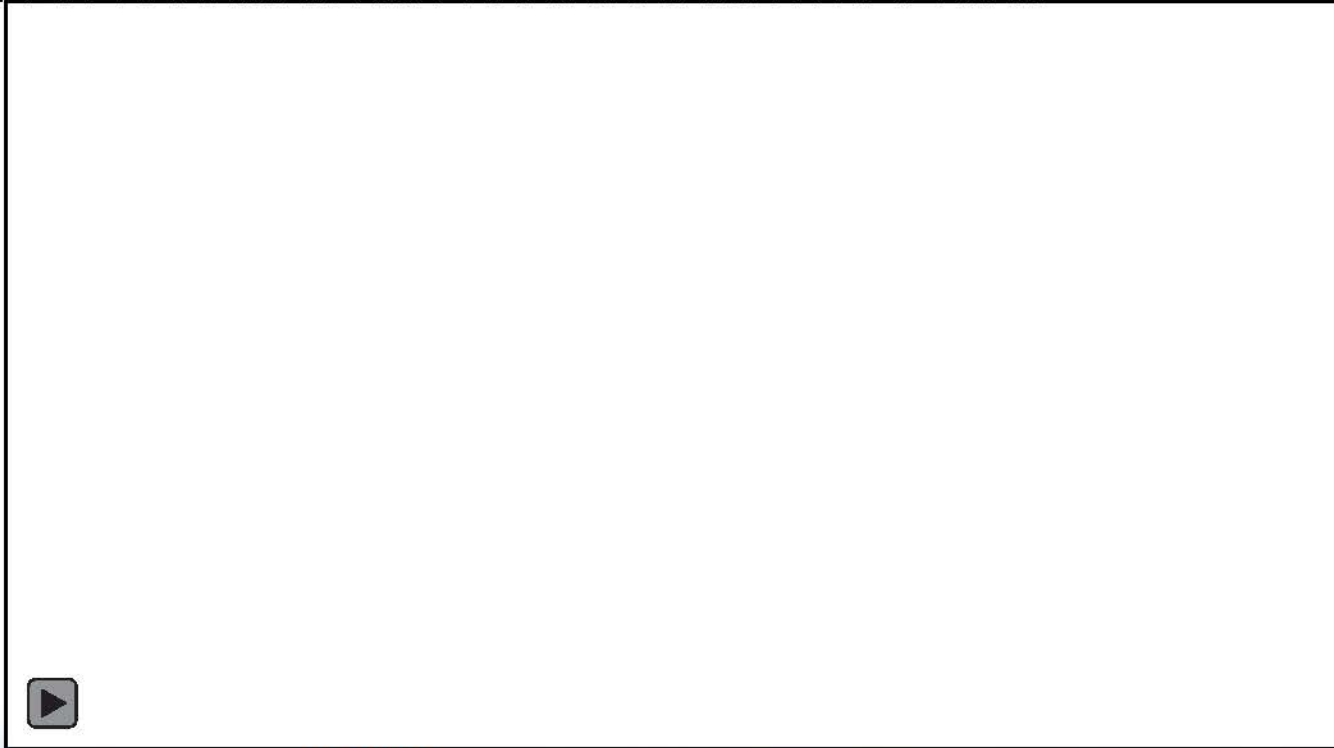
- MBPS INTRO

- USE CASE 1 – TRANSFORM THE WAY NAVY CONTRACTS FOR MODEL-BASED DATA

- USE CASE 2 – MANAGE SYSTEM CONFIGURATIONS

- USE CASE 3 – CREATE CONFIGURATION CHANGE FOR WEAPON SYSTEM 3D TECHNICAL DATA PACKAGE (TDP)

- USE CASE 4 – ACQUIRE AND INTEGRATE SUSTAINMENT DATA

- **USE CASE 5 – CREATE LIFECYCLE COST AND READINESS MODELS FOR DESIRED A_o**

- Q&A DISCUSSION – ALL - 10 MINS

MBPS - Model Based Product Support

○ The United States Navy requires a Model-Based Product Support (MBPS) system(s) with enterprise and field level capability to effectively and efficiently acquire, field and sustain weapon systems' **digital twin** and enable appropriate **predictive analysis** and modeling tools that can improve material availability and **reliability**, **increase operational availability**, and reduce Operation and Sustainment (O&S) cost.

Why MBPS?
The Need for Digital Transformation

CURRENT STATE

FUTURE STATE

Digital Twin   Reduce O&S costs   Improve Logistics   Predictive Analysis
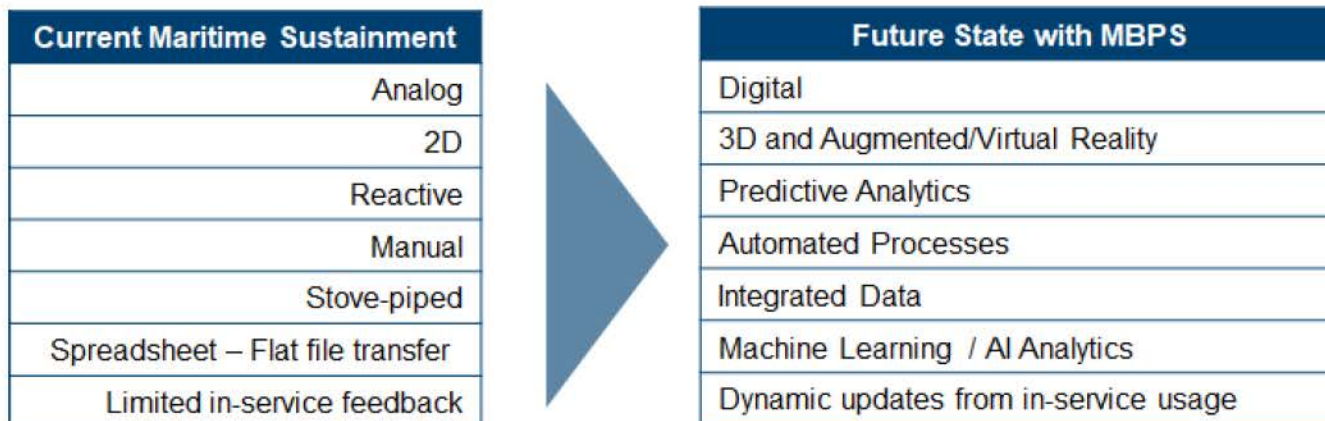
INCREASE OPERATIONAL AVAILABILITY
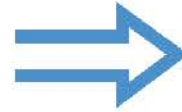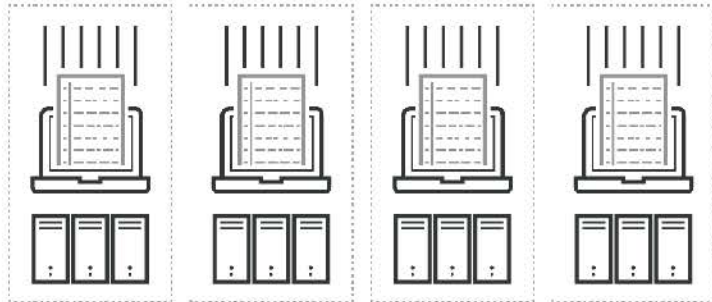
Increasing weapon system readiness uptime while reducing support costs requires a digital transformation of NAVSEA logistics IT systems

Current and Future State

- MBPS delivers readiness/sustainment as a warfighting capability and combat multiplier

- MBPS modernizes the maritime configuration management, provisioning, readiness modeling and technical data management Information Technology (IT) portfolio to enable advanced warfighter readiness capabilities

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

Current Maritime Sustainment
Analog
2D
Reactive
Manual
Stove-piped
Spreadsheet – Flat file transfer
Limited in-service feedback

Future State with MBPS
Digital
3D and Augmented/Virtual Reality
Predictive Analytics
Automated Processes
Integrated Data
Machine Learning / AI Analytics
Dynamic updates from in-service usage

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
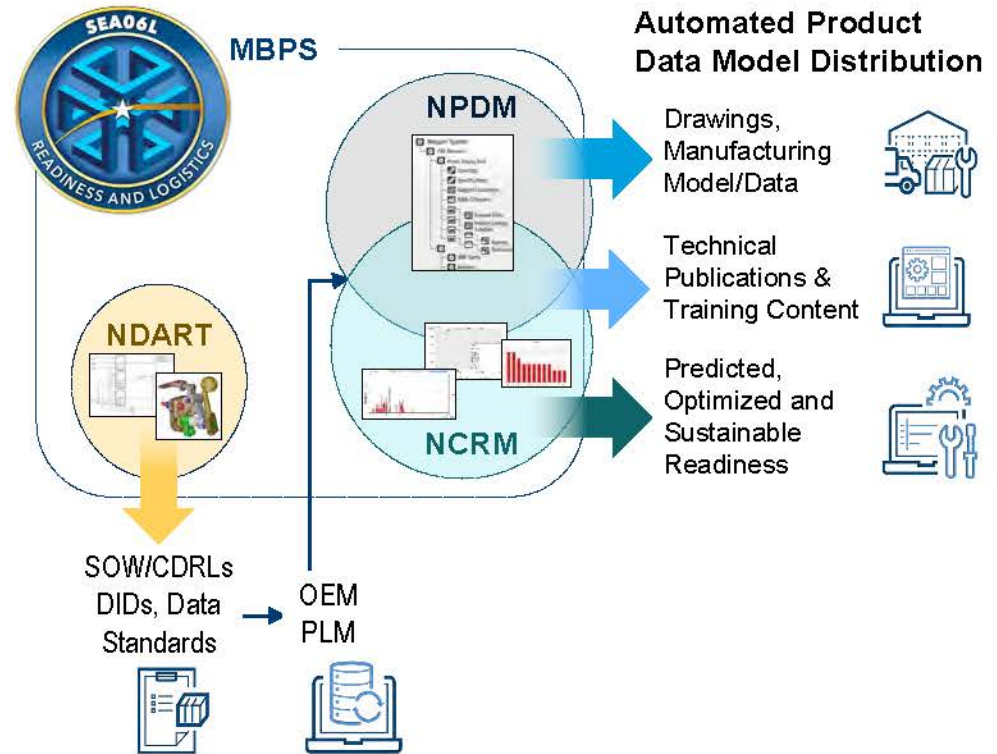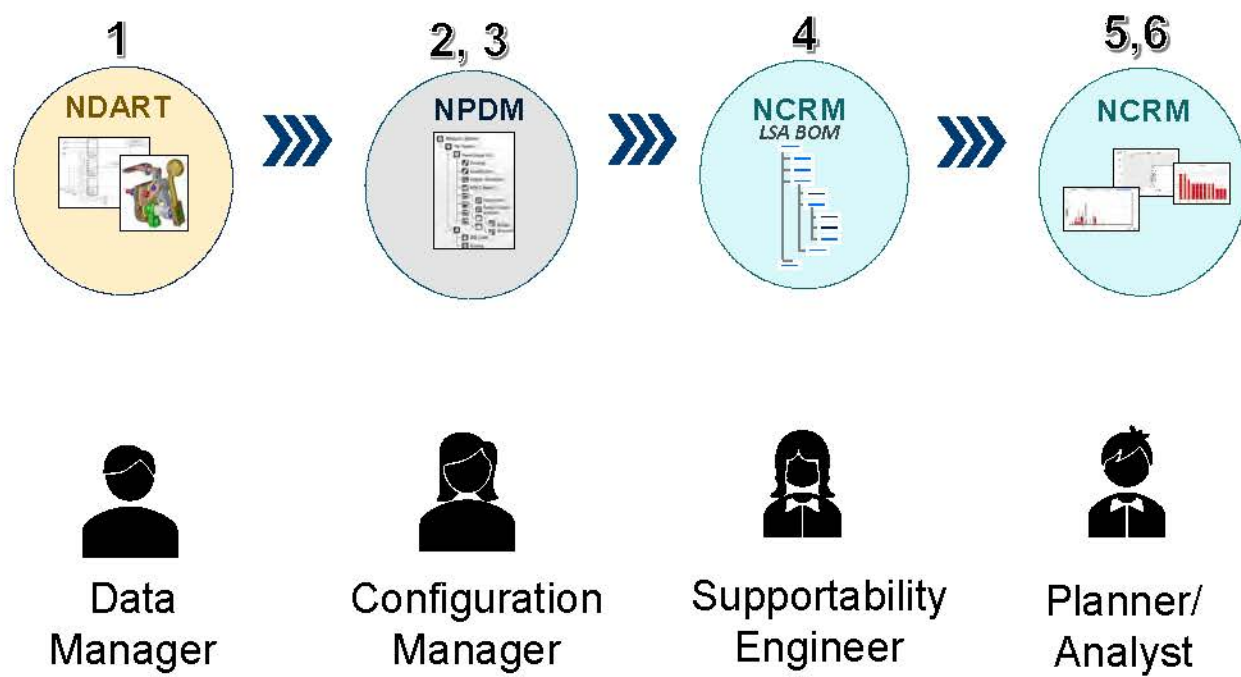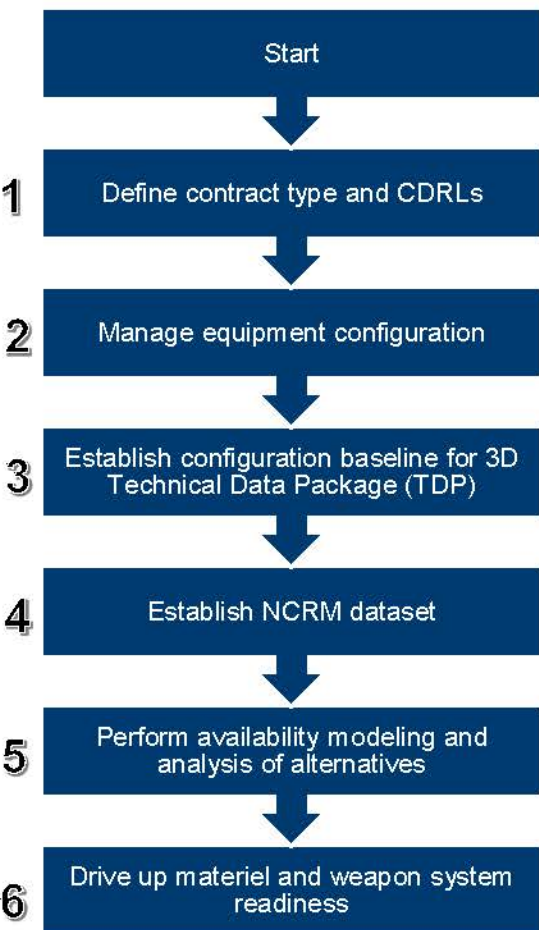

MBPS is comprised of three primary capabilities providing enterprise product data and readiness analytic services to enable predictive digital twins that optimize lifecycle costs ($) and maximize operational availability (A_O)

6

DEMONSTRATION SCENARIO

Demo Flow

Start

1 Define contract type and CDRLs

2 Manage equipment configuration

3 Establish configuration baseline for 3D Technical Data Package (TDP)

4 Establish NCRM dataset

5 Perform availability modeling and analysis of alternatives

6 Drive up materiel and weapon system readiness

A team of NAVSEA personnel collaborate on the contract definition, data acquisition and lifecycle planning, of a new weapon system

1
NDART

2, 3
NPDM

4
NCRM
LSA BOM

5, 6
NCRM

Data
Manager

Configuration
Manager

Supportability
Engineer

Planner/
Analyst

MBPS Workbench Overview

- Initial entry point for all MBPS users that provides:
  - Tailored menu selections based on MBPS personas
  - Quick and easy access to search and view configuration data, technical manuals, and engineering drawings
  - Access to MBPS training materials and Help functions

- Information is grouped by either "Parts" or "Documents"
  - "Parts" = Ship/Hull configuration data and structure (i.e. DDG-1000)
  - "Documents" = Technical Manuals and Engineering Drawings

- MBPS functions are located in the Custom collections" section
  - About – about page for the MBPS program and capabilities overview
  - FAQ – Help page with answers frequently asked questions and other help functions
  - External Links – contains links to supporting sites for the MBPS user community.
  - Training – Area for locating training material(s) for MBPS capabilities
  - NDART Contract Technical Package App – Application for the creation of a contract technical package
  - NDART Library – Launches the NDART Library where the generated contract technical packages are stored and managed in NPDM(Data Administrators)
  - NPDM – Launches the NPDM application.

Data Consumer

PART TASKS COLLECTION

View Design Files

View Drawing

View & Measure in 3D

View Part Properties

View Parts List

View Part Structure

DOCUMENT TASKS COLLECTION

View Document

View Document Structure

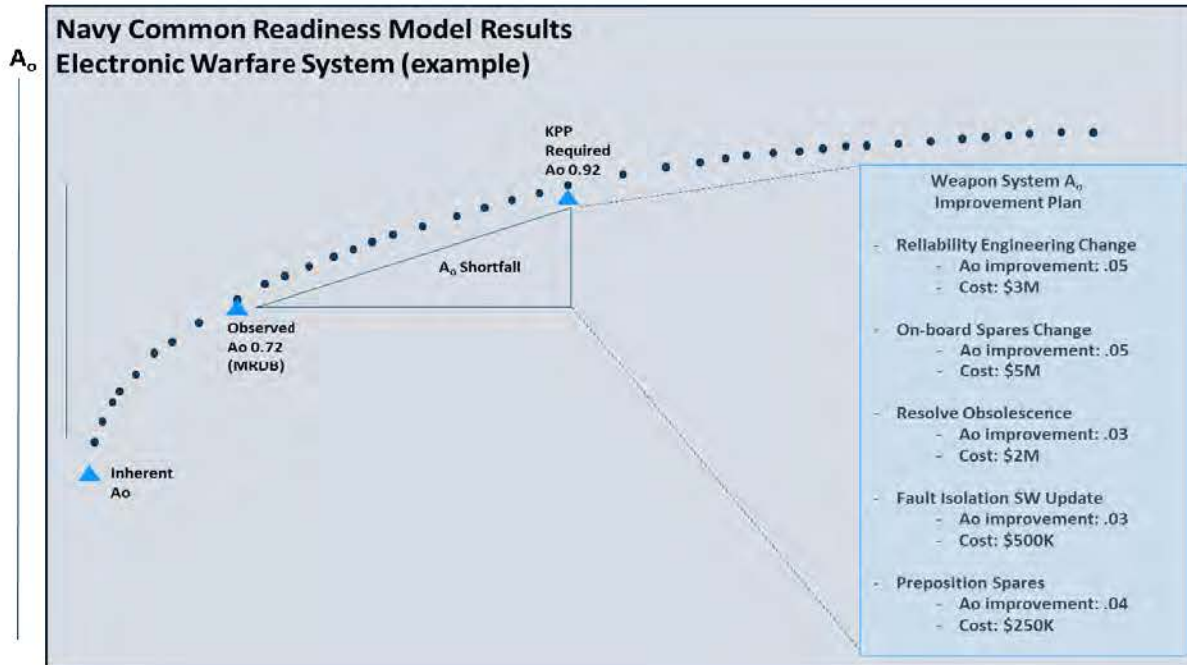**CUSTOM TASKS COLLECTION**

About

FAQ

View External Links

Contract Technical Package Creator

Training

NPDM

NDART Library

USE CASE READINESS MODELING
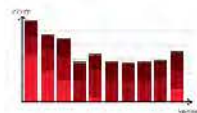
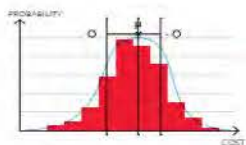# NCRM - data driven analysis of alternatives that drive readiness

Navy Common Readiness Model Results
Electronic Warfare System (example)

- KPP Required Ao 0.92
- Observed Ao 0.72 (MRDB)
- Inherent Ao
- Ao Shortfall

Weapon System Ao 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

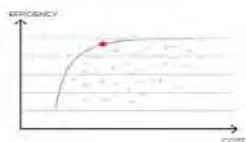- Preposition Spares
  - Ao improvement: .04
  - Cost: $250K

Total life cycle perspective on costs and performance

Risk management

Agile resource dimensioning

Scenario evaluation

- ✪ Deliver the desired level of availability at the optimum cost
- ✪ Reduce excess inventory
- ✪ Invest in strategic spares that are the main drivers of system readiness

Q&A/Discussion

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UNCLASS