Diminished Manufacturing Sources and Material Shortages (DMSMS)

Obsolescence 101
Within the HM&E Navy

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Distribution Statement A: Approved for public release; distribution is unlimited.
The Obsolescence Issues We See Daily Are Only the *Tip of the Iceberg*…

**Obsolescence on the Surface**

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<tr>
<th>Subsurface Contributors</th>
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<td>DOD Budget Cuts</td>
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<td>Changing and Diminishing Manufacturing Base</td>
<td>Reduced Domestic Sources of Supply</td>
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<td>Legacy System Life Extensions</td>
<td>Supportability</td>
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</table>
What is HM&E & Why Monitor HM&E?

What is Hull Mechanical and Electrical (HM&E) equipment:

- All equipment required to operate Navy Ships:
  - Pumps, Valves, Motors, Toilets, Programmable Logic Controllers (PLC’s)
  - Galley Equipment, Range Hoods, Dishwasher, stoves, grills
  - Propulsion Controls (Electronic in nature), Damage Control Consoles
  - Gas Turbine and Diesel Propulsion Engines and all associated systems

Why Monitor HM&E

- The Majority of the 2030 Battle Force Exists Today and is operating
- We Will Have Obsolescence Problems That We Did Not Plan For
  - Ship Life Extensions
  - Fact of Life Changes (OEMS closing product lines or Closing doors all together)
  - Ever Changing Markets (Commercial sales driving industry, not Gov’t anymore)
- Mission Readiness needs to be maintained
HM&E Systems/Problem Areas

22 Technical Areas
(19 Surface Ship Areas and 3 Additional Areas)

Steam Generation/Systems
Submarine Antennas
Submarine Sail Systems

Machinery Controls
Condition Assessment Systems
Damage Control & Firefighting
Fasteners, Fuels & Lubricants, and Water Chemistry
Sensors Systems & Wireless Systems
Auxiliary Machinery & Fluid Systems
Ship Handling & Deck Machinery

Pollution Abatement Systems
Maneuvering, Hydraulics, Hull Outfitting & Habitability
Solid and Hazardous Waste

Waste Water Engineering

Life Support Systems, Climate Control, and Compressed Air Systems
Ship Survivability

Diesel Engines & Power Transmission Systems
Electric Power Systems

Gas Turbine Systems

HM&E Networks, Integrated Bridge, and Machinery Interface Systems

Cargo/Weapons Handling & Stowage Systems

Pollution Abatement Systems

HM&E Systems/Problem Areas

HM&E Systems/Problem Areas

HM&E Systems/Problem Areas

HM&E Systems/Problem Areas

HM&E Systems/Problem Areas

HM&E Systems/Problem Areas

HM&E Systems/Problem Areas

HM&E Systems/Problem Areas

HM&E Systems/Problem Areas

HM&E Systems/Problem Areas
### Six Tenets of Managing DMS

#### INTERACT/FORM TEAMS
- Teams to include:
  - ISEA/ILS Sponsors
  - Life Cycle Managers
  - Industry Builders

#### MONITOR MARKET
- **Vendor Surveys:** Regular correspondence with the Original Equipment Manufacturers (OEMs)
- **Market Monitoring:** Researching Industry Trends

#### IDENTIFY ISSUES
- Predicting obsolescence early is the key to successfully managing during the design, build, and operational phases.

#### ESTABLISH CASES
- **Verify Obsolete Items**

#### ANALYZE SOLUTIONS
- Cost Effective
- Value Engineering

#### PROPOSE RESOLUTIONS
- Provide to PEO
- Business Case Analysis (BCA)
- Develop Metrics

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NAVSSES Philadelphia DMSMS Tracker
- Assemble, Consolidate and Analyze Information for Decision Making and Metrics
- Data sources Fleet, GIDEP, DLA, NAVSUP-WSS, HEDRS, OEM’s, and NAVSEA Emails
- Ship Level Reporting and research Capability

DLA Engineering Support Program
- Provides Technical Guidance to DLA for DLA Managed and Procured Service Used Parts
- DLA-339 Program AVG 4,800 Issues Yearly

NAVSUP Engineering Support Program
- Provides Technical Guidance to NAVSUP for NAVSUP Managed and Procured Service Used Parts
- ESRS Program AVG 200 Issues Yearly

NSWC-PLD Data Sharing & Interface Activities

**Life Cycle Programs**
- Carriers, Surface Combatants, MACCP, Subs, LCS, JHSV & LCAC

**Supply Systems**
- DLA & NAVSUP-WSS

**Warfare Centers**
- NUWC Keyport & NSWC PHD

**New Acquisition Programs**
- Carriers, Surface Combatants, MACCP, LCS, JHSV & SCS

**Industry**
- Sperry, LM, HII, GD, NNSY & Austral

**Tool Sets**
- SMART, OMIS

*Sharing Data . . . reducing costs, while identifying Cross Platform Solutions*
Reactive vs. Proactive

**Reactive**
- Identify DMS issues near to or after date of obsolescence
- “Fighting Fires”
- Time Constraints
- Starting point for Proactive Management

Cost: $$$$$$

**Proactive**
- Identify obsolescence before it becomes an issue
- Solutions developed in context of Technology Roadmap
- Focused on sustainability through a total systems engineering approach

Cost: $$$$$$
The ISEAs identification and/or approval of alternate/substitute parts reduces the need for high cost solutions (e.g. Reverse Engineering and Redesign efforts) to support the ships’ life expectancy.

98.4% OF RESOLUTIONS WERE LOW COST-LONG TERM SOLUTIONS.
DMS Resolution Elements

- **DMS Evaluation**
  - Generate Detailed Reports of System/Equipment Status (R/Y/G)
  - Perform Internal Review in IPT and Technical Forums
  - Perform Business Case Analysis (BCA) of Options

- **ISEA Technical Review**
  - Present and Review Technical Options
  - Complete/Review Business Case Analysis
  - Evaluate System Configuration Considerations and Potential Tech Refresh Planning
  - Encourage Use of NAVSEA 06 Commonality Mandate
  - Recommend/Approve Resolution

- **Program Review and Adjudication**
  - Provide Notification and Authorization
  - Present Review Results to Program and Decision Makers
    - Present Developed Quad Charts
  - Obtain Authorization From a Technical and Contractual Standpoint

- **Resolution Implementation**
  - Implement Resolution and Monitor Results
  - Close DMS Case and Provide Metrics and Reports
A Supply System Health Analysis was performed to identify High, Medium, and Low Risk candidates for obsolescence.

Historical Data:
- 2152 candidates analyzed
  - 164 were identified as Red – High Risk Candidates for obsolescence
    - 1 verified as obsolete through vendor surveys
  - 650 were identified as Yellow – Medium Risk Candidates for obsolescence
    - 26 verified as obsolete through vendor surveys
  - 1338 were identified as Green – Low Risk Candidates for obsolescence

As of 6 Jan 2013, the current status of the 27 obsolete components:
- 3 components are Red and currently under review by the ISEA for resolution
- 24 components have been reviewed and resolved by the ISEA and are now Green. The DMSMS cases are closed.

Current Health Status of the 2152 candidates:
- 21 Red
- 105 Yellow
- 2026 Green
**System C System Assessment**

**Assessment of system health is VERY GOOD:** 95% parts in production, 0% repairable, considering available spares, supportability of System C is increased to 95%. However, 5% of the parts are at risk of going unsupported without DMS resolutions. (333 items monitored)

Key actions underway to mitigate obsolescence risk and sustain support:

- Life-of-type (LOT) or bridge buys in progress / planned (0 parts)
- Monitoring Inventory Demand (53 parts)
- Investigating resolution (10 parts)
- Procurable parts not yet DMS (6 parts)
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* QUAD Chart
Company A valves are used on all Navy SYSTEM E equipment to regulate the flow. Two years ago, Company A stopped making the repair kits for the ¼ to ¾ inch globe and angle valves for the Navy and Company B Inc. was contracted to reverse engineer the internal components of the valves for repair kits. Repair kits will minimize future maintenance requirements.

**Maintenance Description**
- Replacement of a failed valve requires hot work and due to the presence of chemicals in SYSTEM E, the equipment must be evacuated prior to hot work (labor intensive process).
- Replacement of the internal components would only require the specific area of piping to be secured and the refrigerant loss would be classified as a “minimal release.”
- Ship’s Force labor hours are reduced by eliminating the need to evacuate the system and is a considerable cost savings to the Navy.

**Fleet Lifetime Cost Savings**

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<td>$3,480.59</td>
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<td>Lifetime Best Case Savings</td>
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<td>Lifetime Worst Case Savings</td>
<td>$1,373.98</td>
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**Analysis**
- Cost savings per valve installation were calculated using the man hour rates for FY11 provided by the Fleet Analysis Center (FAC) and 3M data.
- Annual demand was calculated by averaging the past 16 years of demand data from 3M.
- Lifetime cost saving was calculated by multiplying the cost savings per installation by the lifetime demand.
- The average cost savings per valve installation is $3204, the best case cost savings per valve installation is $6315, and the worst case cost savings per valve installation is $980.

**Reduced Total Ownership Cost**

- Annual Demand – 447
- Maintenance Actions Expected over the Next 30 Years - 13,421
FY15 DMSMS PROGRAM HIGHLIGHTS

- Assisted in identifying a new source of supply for the Weapons Handling Hoist for New Acquisition and Life Cycle ships while incorporating commonality and standardization initiatives
- CG-47 Integrated Ship Controls (CG-IS) DMS Long Term Support continued with ZERO DMS impacts to Fleet
- DDG-51 MCS Steering, Integrated Bridge System (IBS), IBNS Common Equipment Programs continued with ZERO DMS impacts to Fleet
- Greater than $55M potential cost savings to fleet by reutilizing recovered assets
- Carrier Obsolescence Management Working Group (COMWG) received the 2012 Naval Sea Systems Command Team Excellence Award
- Completed Supply System Health Analysis for Foreign Military Sales (FMS) Class HM&E
- Initiated proactive monitoring of HM&E Systems aboard LCAC, LHD-8, LSD-41, and SSN-688 Classes
DMSMS Program as a Resource

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What We Need To Know:

- National Stock Number
- Manufacturer Part Number
- CAGE Code
- APL (if available)
- Quantity required
- POC information
Backup
Red, Yellow, Green
What Does it All Mean?

- **Unverified Red**
  - Supply System Analysis
    - No known technical data is available and current stock levels will not support present consumption rates more than two years.

- **Verified Red**
  - Vendor Survey Analysis
    - All known sources of supply have discontinued the product or are no longer in business, no known technical data available and current stock levels will not support present consumption rates more than two years.

- **Yellow**
  - Supply System Analysis
    - No known technical data available and current stock levels will support present consumption rates for two years but less than seven years.
  - Vendor Survey Analysis
    - Sources of supply have or plan to discontinue production, no known technical data available and current stock levels will support present consumption rates for two years but will not support the needs for seven years or the estimated end of life for the system.

- **Green**
  - Supply System Analysis
    - Complete technical data packages available. Stock system will support present consumption rates for the seven years.
  - Vendor Survey Analysis
    - Sources of supply verified availability and plans to support the item for the next seven years or the estimated end of life for the system.
Inputs of Reported DMSMS Items

- DLA-339
- NAVSUP TR
- Fleet Input
- Research Studies
- OEM Notifications
- ISEA Notifications
- Bill Of Material Reviews
- Vendor Surveys
- Shipbuilder/SUPSHIP Notifications
- OTHER ???

CASE TRACKING FILE: NSWCC-SSES DMSMS TRACKER DATABASE

PRIORITIZE WITH PEO

Verify reported DMSMS. Fix easy resolutions 30%

RESEARCH / DETERMINE RECOMMENDED ACTIONS & DEVELOP COST ESTIMATES

REVIEW/PRIORITIZE CASES WITH TYCOM/ FLEET

TASKING AND BUDGET APPROVALS

OBTAIN FUNDING AND TASK ACTIVITIES

SHARE INFORMATION WITH EXTERNAL
- OEMS
- SHIP BUILDERS

NSWC-PLD

MONITOR EXECUTION STATUS

PROVIDE RESOLUTIONS/FUNDING REQUIREMENTS VIA QUAD CHART

NSWC-PLD

TRACK/DEVELOP/REPORT METRICS

December 2015

Distribution Statement A: Approved for public release; distribution is unlimited.
Obsolescence Management Provides Value Added

DMSMS EFFORTS CONTINUOUSLY RESULT IN VALUE ADDED SUPPORT FOR the UNITED STATES NAVY

- Interfacing with DoD and DoN DMS Working Groups to maintain Best Practices (SD-22 Guidance and SSES DMS Policies and Procedures)

- Manage DMS throughout ship’s lifetime—from new acquisition, during operation lifecycle, and through decommissioning

- Leveraging from Ships and System Commonality to resolve issues and share costs

- Integrated with Engineers for Tech Refresh planning, design groups, and ship builders

- Proactive management enhances DMSMS sustainability while reducing Fleet impacts