
Maritime Maintenance For The 21st Century



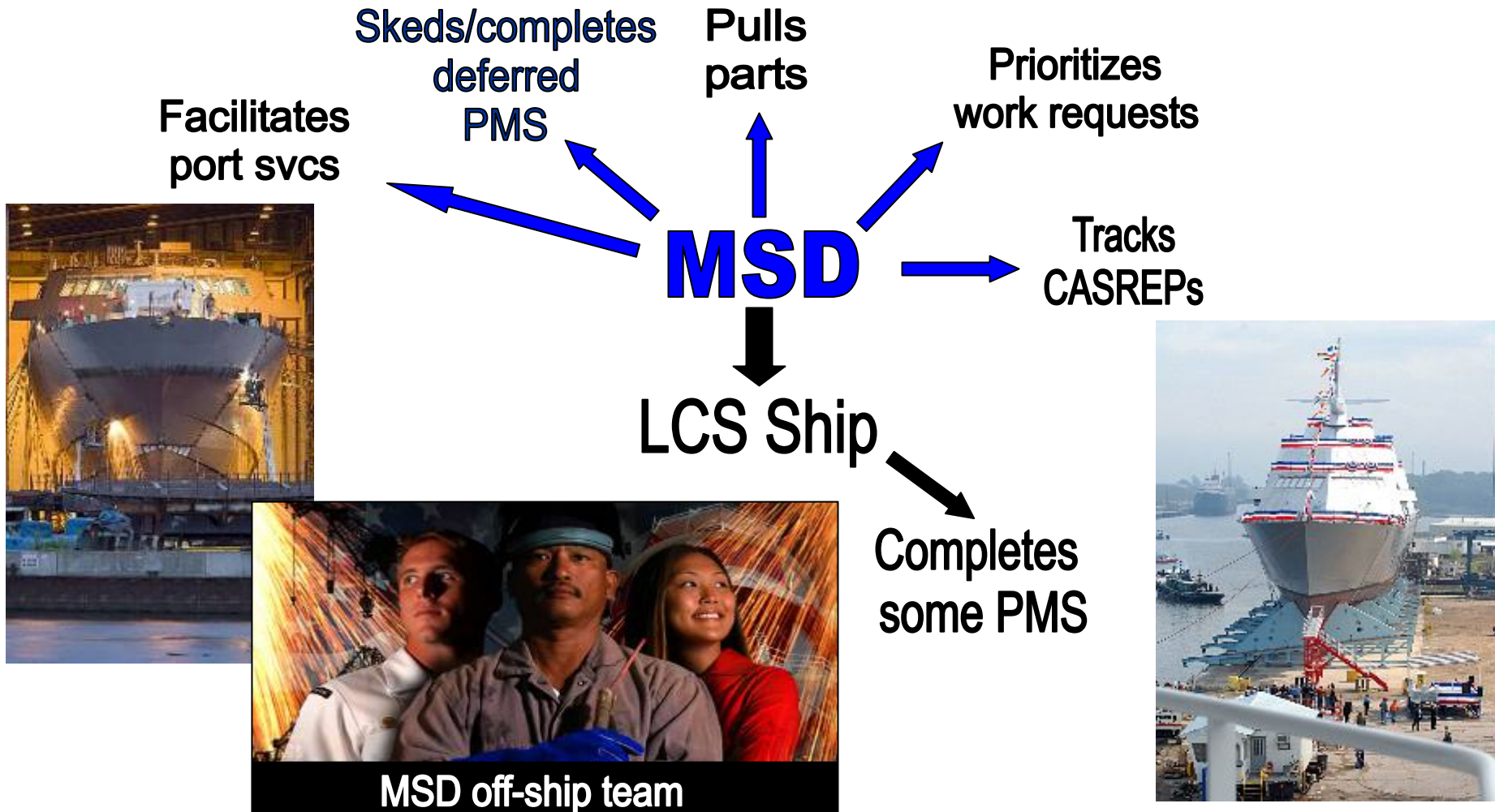
2007 DoD Maintenance Symposium
RDML Joseph F Campbell, CNO, N43B

- ◆ Organizational, Intermediate and Depot Level Maintenance (O/I/D)
- ◆ Continuous Maintenance Availabilities (CMAV)
- ◆ Multi-Ship/Multi-Option Contracting (MSMO)
- ◆ Integrated Condition Assessment System (ICAS)



I/O Level Combination

- ◆ Maritime Support Detachment demonstrates Intermediate and Organizational (I/O) Combination in LCS Class



Continuous Maintenance Availabilities (CMAVs)



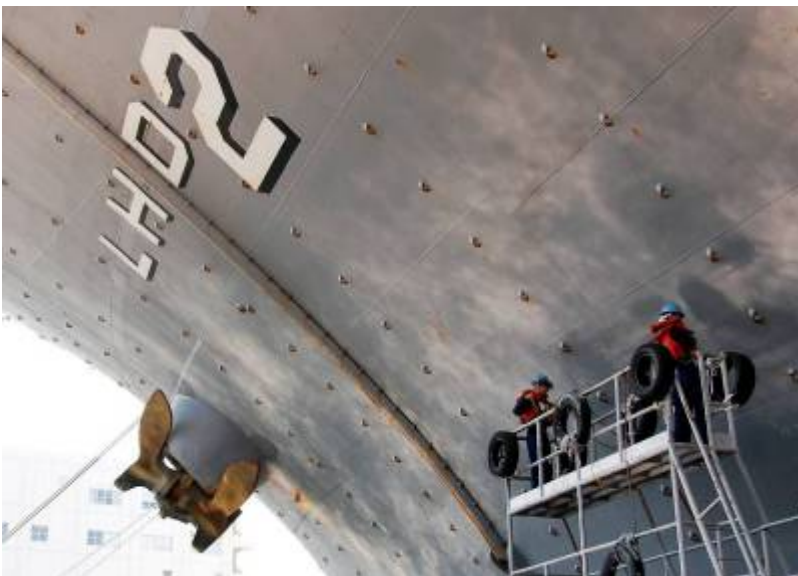
- ◆ Navy continues to go toward Continuous Maintenance such as CVN Carrier Incremental Availabilities (CIAs) in new operational cycle

- ◆ CMAVs reduce the material readiness “bath tub” effect
- ◆ CMAVs reduce work load variation – provides level-loading



Multi Ship Multi Option (MSMO) Contracting

- ◆ Strategy: Max MSMO contracts for Surface Maint / Mod
- ◆ Continuous, responsive, accessible, flexible, affordable, 24/7 maintenance delivery process
- ◆ Enterprise Behavior + MSMO supports FRP and delivers required A_0 to Fleet
- ◆ LHD-7 Capstone test of MSMO-AIT integration

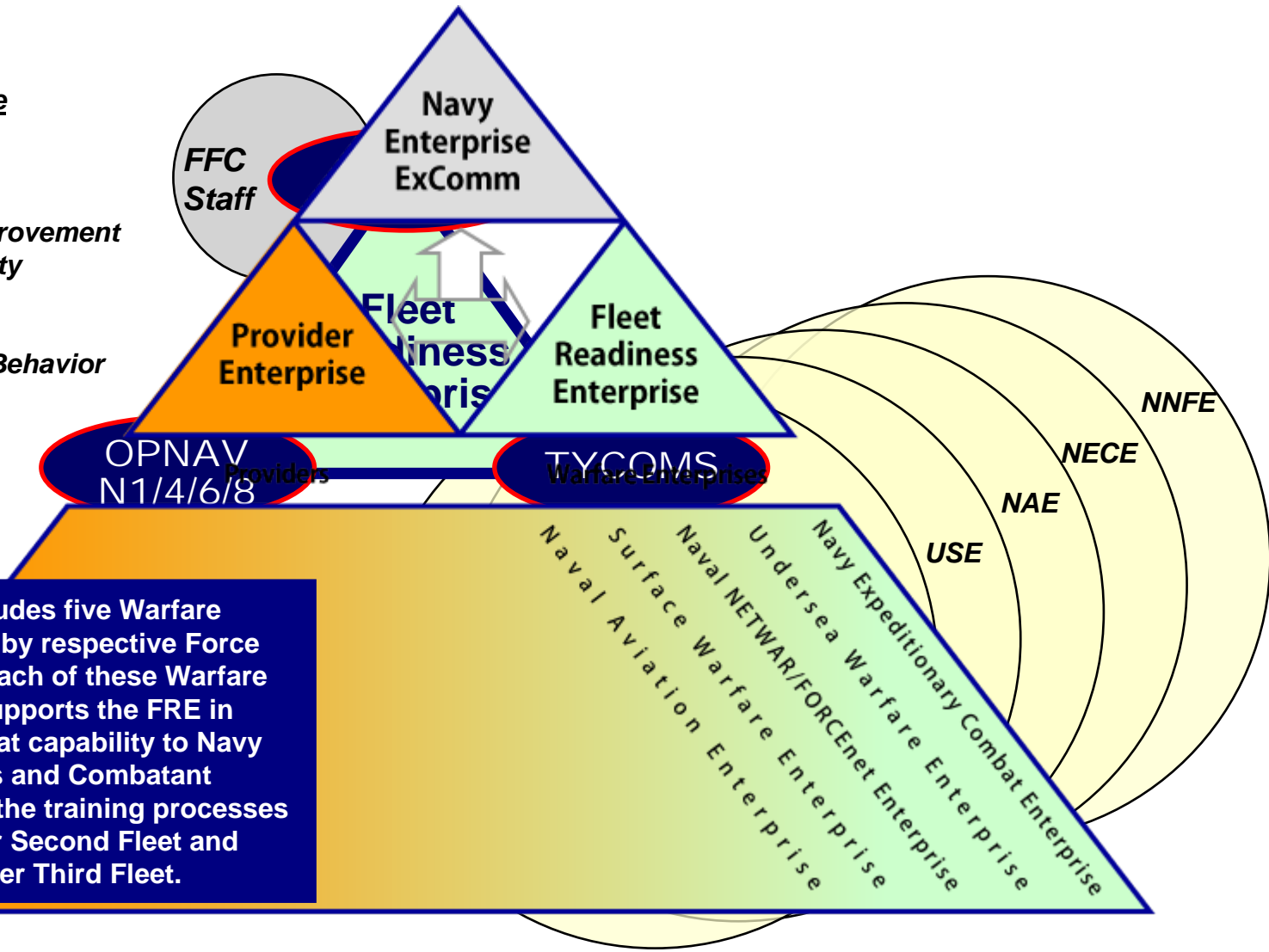


Enterprise Construct



Fleet Readiness Enterprise

- Lead and Empower
Warfare Enterprise
Readiness/Cost improvement
- Drive Enterprise Maturity
- Barrier Removal
- Fiduciary Integrity
- Incentivize Enterprise Behavior
- CPF Collaboration



The FRE includes five Warfare Enterprises, led by respective Force Commanders. Each of these Warfare Enterprises supports the FRE in delivering combat capability to Navy Components and Combatant Commanders, via the training processes of Commander Second Fleet and Commander Third Fleet.

Warfare

- Re
- Pro
- Ov
- FR
- For

- 8 CLASSRONs stood up JUN '07

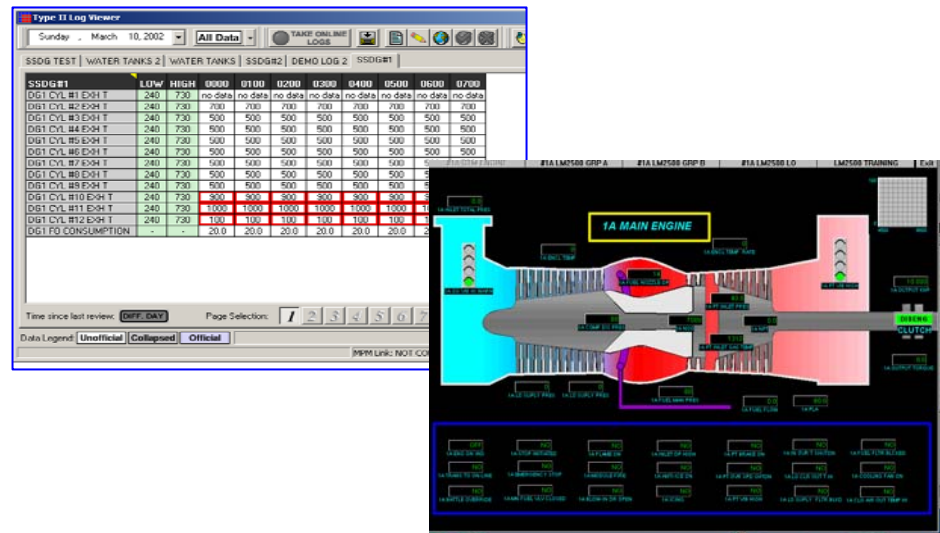


IMPROVE WARFIGHTING READINESS

Integrated Condition Assessment System (ICAS) Capabilities

- ◆ CBM implementation tool
 - Machinery Data Trending
 - Rules-based expert system
 - Vibration Analysis
- ◆ Troubleshooting Aid
 - Rules-based expert system
 - Event capture
- ◆ Operational Assessment
 - Material Assessment
 - Plant Situational Awareness
 - Assessment Visit Support (Availability Planning)
- ◆ Tool that enables reduced manning
- ◆ ILS --access & linkage to PMS, EOSS and IETMs
- ◆ Electronic Log Sheets

Data Logging / Situational Awareness



Continuous Analysis

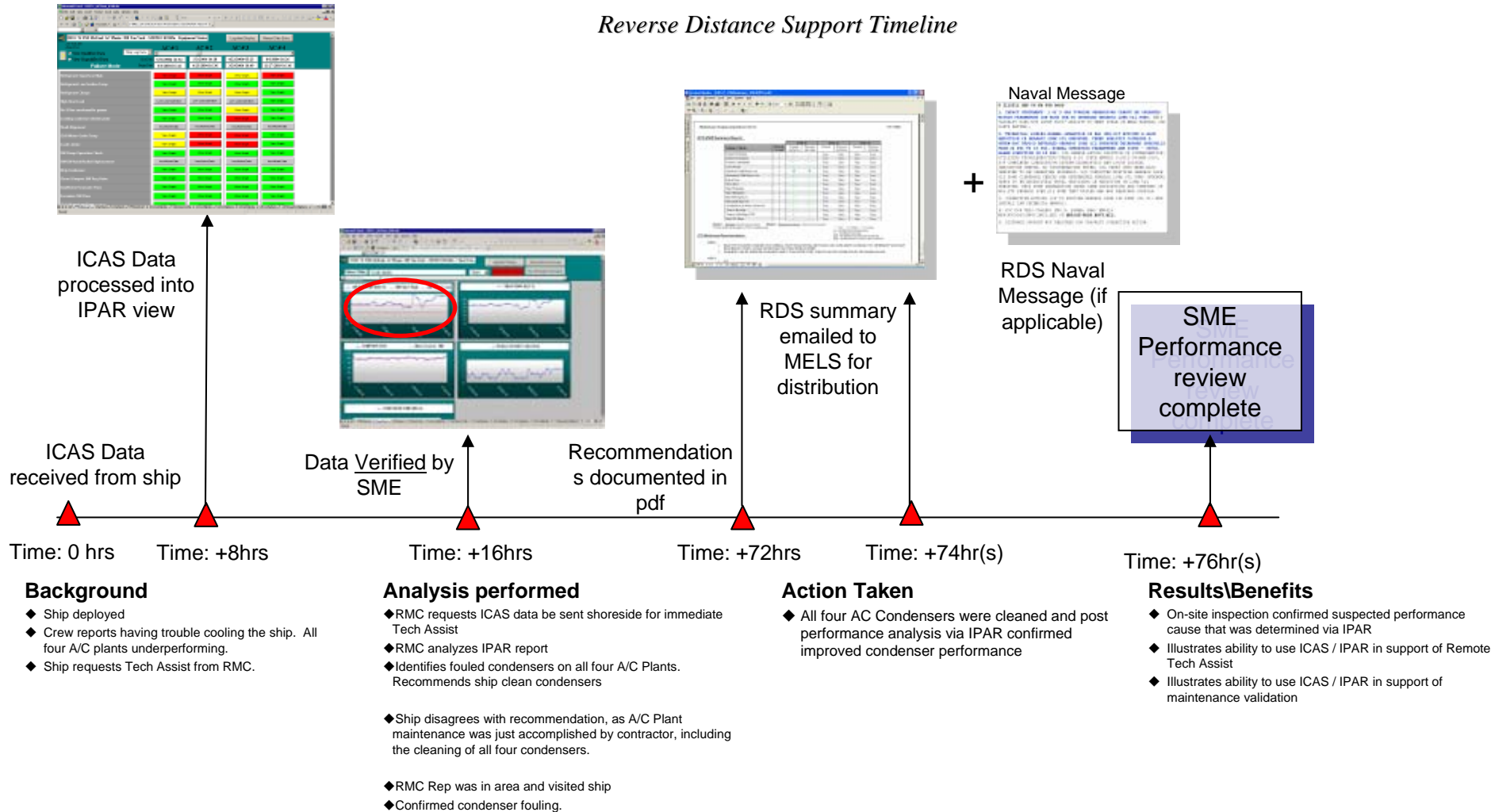
The figure shows two screenshots from the ICAS system. The top screenshot is a 'Hybrid Tag Setup' window with an advisory message: 'LEAKING SUCTION VALVES. Compressor suction temperature and pressure are at the high limit. Inspect compressor suction valves (AW NAVSEA 0959LP-049-7010 Para. 5-3.3. Replace valves if necessary.)'. The bottom screenshot is a 'Trend Chart & Alarm Log' window showing a line graph with red and green data points over time.

ICAS Expert System:

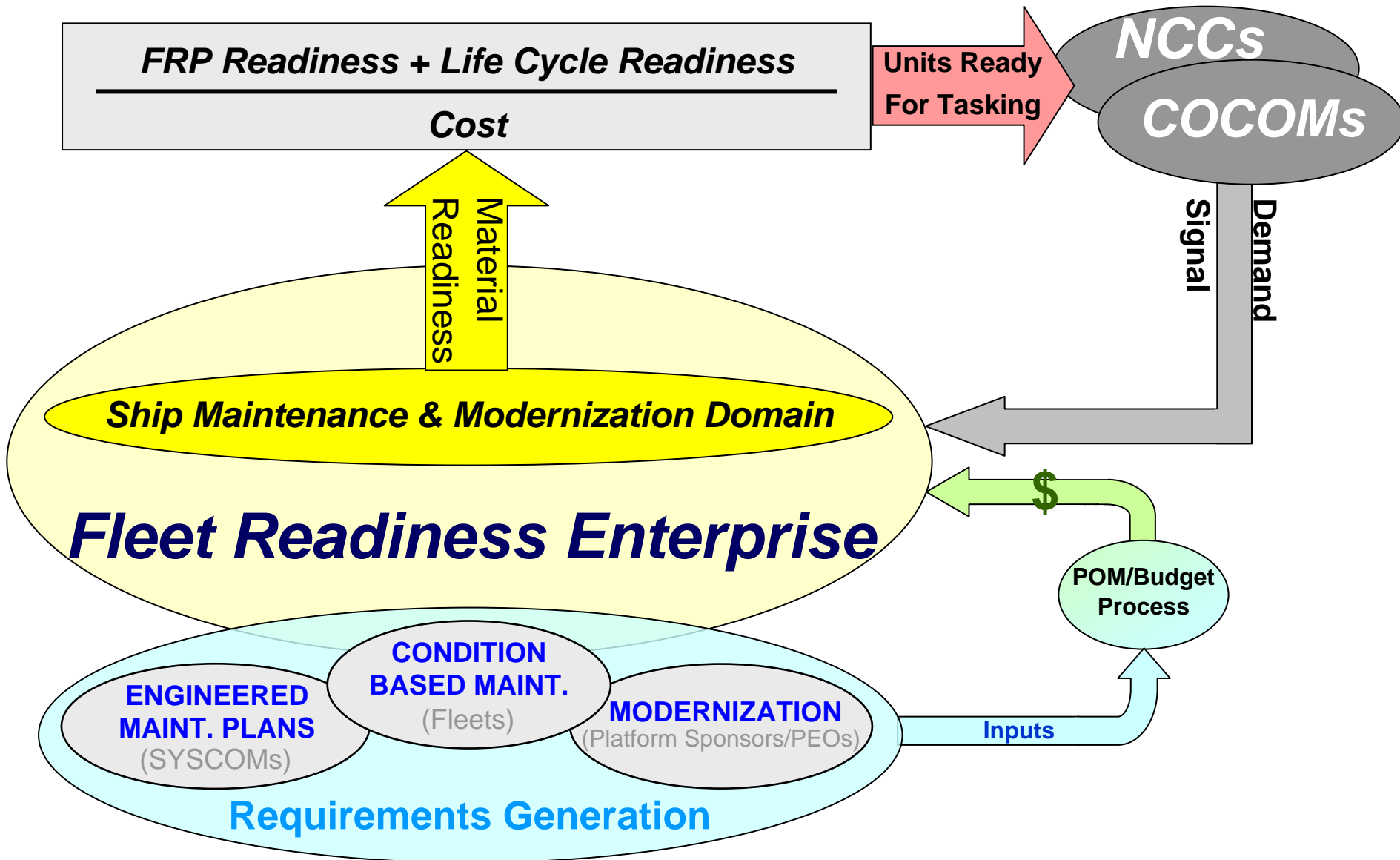
- performs a continuous analysis of machinery data.
- automatically generates maintenance advisory

DDG 74 – AC Plant Fouled Condensers

Reverse Distance Support Timeline



Today's Maintenance Strategy





Backup Slides

Elements of Success in LHD 7 Capstone

- ◆ MSMO funded to develop a detailed, integrated, & balanced master production & test plan
- ◆ Resolved modernization package potential conflicts in planning
- ◆ MOU negotiated between stakeholders
 - NSA (MARMC) designated as arbiter
- ◆ Results
 - Availability completed on time, at programmed cost
 - MSMO returned \$1.5M to the Navy due to reduced OT, growth, new work and disruption costs (ROI = 400%)
 - All AITs were able to execute tasking per the original master schedule without adverse cost impact
- ◆ Demonstrates MSMO support to FRE in delivering combat capability



**First Capstone integrated
by MSMO**

CLASSRON: Enabler

ENTERPRISE

GAP

FLEET

Support →

**SWE
Board of Directors (BCD)**

CLASSRONs

CNSF

Chief Operating Officer

**Communications
Team**

PAC

LANT

**Sustainment &
Modernization
Team**

**Personnel
Readiness Team**

**Chief Financial
Officer**
**Strategic Financial
Management Team**

**Chief Readiness
Officer**

CLASSRONs

**Over-arching
Metrics
Team**

CSGs/ESGs

DESRONs

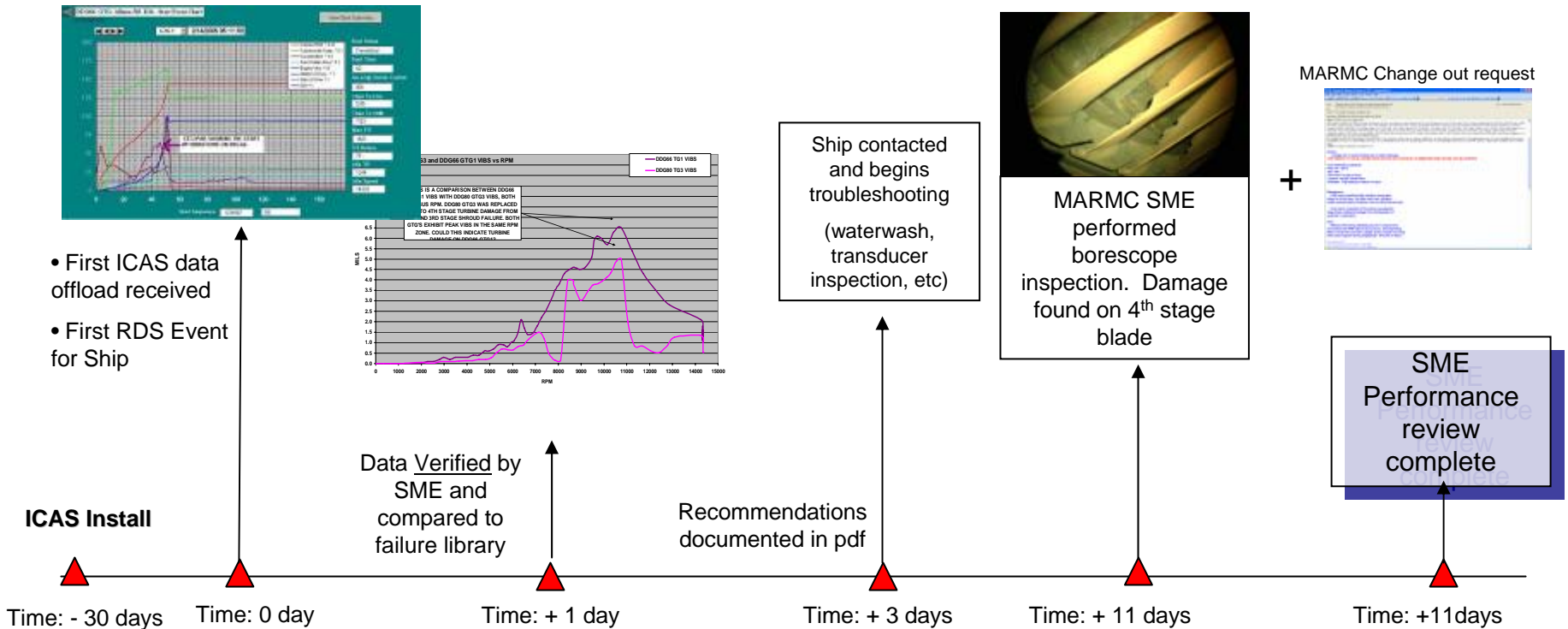
PHIBRONs

← **Feedback**

PRODUCE WARSHIPS READY for TASKING

DDG 66 GTG High Startup Vibration

Reverse Distance Support Timeline



Background

- ◆ Ship preparing for 18 month SEA SWAP deployment
- ◆ All Gas Turbines were thought to be in good condition
- ◆ Problem identified with first data offload after install

Analysis performed

- ◆ Startup vibrations compared to DDG80 GTG high vibrate problem that resulted in engine replacement due to 4th Stage turbine blade damage
- ◆ Vibe signature matched and suspected 4th stage turbine damage on GTG#1

Action Taken

- ◆ Ship notified (in POM period) and begins troubleshooting
- ◆ MARMC performs borescope inspection during connection of independent vibration gear
- ◆ Borescope revealed, (as suspected), 4th stage turbine blade damage

Results\Benefits

- ◆ Engine replacement accomplished stateside prior to ship deployment
- ◆ Reduced replacement cost
- ◆ Increased Ship/System Readiness