Sustained Materiel Readiness

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Sustained Materiel Readiness

**ISSUE:**
- Suboptimized Materiel Condition Reliability Declining
- Maintenance too expensive
  - Reliability accounts cut ~ 80% over the years
- We must do things smarter to achieve/sustain SPG/CPG readiness
  - Balance Safety, Reliability, and Maintenance activities to achieve readiness at best cost
  - Optimize TIME-ON-WING and Repair TURN AROUND TIME

**WAY AHEAD:**
- Cause and effect predictive modeling
- Continuous process improvements
  - CBM+/RCM
  - Lean, Six Sigma, Theory of Constraint
- Integrated Budgets (engineering, logistics, industrial)
Building the Optimum Materiel Sustainment Plan/Budget

START

SPG/CPG
“WAR PLAN”

mission-based operational readiness requirement

Required Number of RFI Weapons

Required Amount of RFI Materiel (installed + uninstalled)

INTEGRATED MANAGEMENT PLAN

READINESS BASED MATERIEL REQUIREMENTS MODEL

Technical PLAN

INTEGRATED REPAIR/BUILD CYCLE TIME PLAN

SPARES FORECASTING & PROCUREMENT PLAN

MATERIEL TRANSPORTATION DISTRIBUTION PLAN

INTEGRATED BUDGET

R&D
• S&T
• Design

O&M
• In Svc Eng/Log
• DEPOT
• DLR
• WCF

SAFETY STANDARDS

EQUIPMENT RELIABILITY

MAINT/RCM STRATEGY

PIPELINE

COMMON METRICS

PLANNING FACTORS

See to increase sustainment performance

NO

YES

Seek to reduce sustainment costs

MATERIEL READINESS GOALS ACHIEVED?

Required Amount of RFI Materiel (installed + uninstalled)

mission-based materiel readiness requirement

mission-based materiel readiness requirement

Required Number of RFI Weapons

Seek to increase sustainment performance
Materiel Readiness Integrated Management (E2E)

Integrated Approach Achieves Readiness Goals at Reduced Cost
## On Condition Maintenance (OCM) vs Reliability Centered Maintenance (RCM)

<table>
<thead>
<tr>
<th>OCM</th>
<th>vs</th>
<th>RCM</th>
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<tbody>
<tr>
<td>Repair Only What Is Broken</td>
<td>Repair Not Only What Is Broken but What Will Likely Fail Before a Defined Time on Wing</td>
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<tr>
<td>Maintenance Is Unplanned</td>
<td>Focus is Planned Maintenance</td>
<td>Facilitates Resource Requirements Predications</td>
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<tr>
<td>No Requirement to Build for Time on Wing</td>
<td>Build to Achieve Inherent Reliability</td>
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<tr>
<td>Maintenance Driven by Equipment Conditioner or Lowest $/Shop Visit</td>
<td>Maintenance Based on LCC &amp; Value</td>
<td>(What's Best for the Long Term)</td>
</tr>
<tr>
<td>(What's Easiest Today)</td>
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**T700 Engine Life Recovered After Repair**

Reliability Centered Maintenance vs. Current On-Condition Practices

3X+ improvement in Time on Wing (TOW) with Comprehensive Reliability Centered Maintenance vs. Current On-Condition Practices

RCM = Reliability Centered Maintenance

US Army

Commercial CT 7 Turbo Prop

US Coast Guard

Partial RCM Time on Wing Deteriorates

Current Practices Time on Wing Deteriorates

Full RCM Time on Wing Growth
Focus on continuous improvement (Maintenance Cycle Time Days)

AIMD Lemoore Power Plants Shop
F404 Engine Repair Cycle Time

- Oct-01: 83 days
- Apr-02: 40 days
- Oct-02: 14 days
- Apr-03: 11 days
- Oct-03: 10 days
- Apr-04: 5 days
Improving Materiel Readiness
Reliability, Cycle-Time, Cost

Drive reliability up to optimum level

Drive sustainment cycle time down to optimum level

Cost of Readiness
(O&S only)

Life-cycle cost (acquisition + O&S)

Sustainment cycle-time

Cost of Readiness
(R&D/ACQ Only)

Cost of Readiness
(R&D/ACQ/O&S)

Lowest $
T58 Integrated Recovery Approach

T58-GE-402

300 Engines Repaired per year
600 Eng req’d to meet CNO goals
400 hour MTBR

T58-GE-402

108 Engines Repaired per year
390 Eng req’d to meet CNO goals
1000 hour MTBR

Current Process is out of TUNE
Integrated Approach is Harmony.

Technical
• Life Management
• Reliability Centered Maintenance (RCM)
• Design Changes
• Engineering Investigations
• Failure Modes/Effects

Optimized T58 Repair Spec

Logistics
• Publications
• Parts Forecasting
• Inventory Tracking
• Build Specs
• Configuration Tracking

Industrial
• Industrial Process
• Depot/I-Level (IA5A, FHP)
• Facilities/Capital Equipment (IA5A)
• Parts Forecasting (NWCF)
• Depot/I-Level Production (IA5A, FHP)

Integrated Approach is HARMONY!
VISION - Focus Areas

• Readiness Process(es) Improvement:
  – Improve System Life Cycle Management Prediction Capabilities
    • Expertise, Tools and T&E Facilities
    • Cause and effect modeling
  – Optimize Reliability
    • Implement CBM+/RCM
      – Preventing Maintenance Addresses Failure Characteristics
      – Optimize Repair/build specs
  – Optimize Cycle Time
    • Employ CPI (Lean, 6 Sigma, Theory of Constraints)
    • Integrate Depot and Intermediate Level Best Practice and Processes
    • Parts forecasting
  – Integrate Budgets
    • Balance Engineering, Logistics, Industrial Accounts