Should Cost Management For Product Support

4 April 2017
DAU Acquisition Training Symposium
The Future Of Defense Acquisition – Improvement From Within!
Ft. Belvoir, VA
AGENDA

• Should Cost Background Information
• Cost Reductions – a structured approach
  – Follow the money
  – Identify root cost drivers
  – Develop Initiatives
  – Prioritize initiatives
  – Establish Should Cost targets
  – Develop Should Cost POA&M
  – Tracking Should Cost savings
• Should Cost and Product Support
The Congress and the Department of Defense have a responsibility to find answers to these problems together – because we have a shared responsibility to protect our national security.”

- Secretary of Defense Chuck Hagel, 11 April 2013

http://www.usdebtclock.org/index.html
Our structural fiscal trajectory is unsustainable

Our large cyclical deficits are exacerbating debt levels and interest costs

There are serious shortfalls in public investment in education, infrastructure, research and much else that is critical for longer-term competitiveness, growth, job creation and broad-based income increases in the US

Everything must be on the table

"This department simply cannot risk continuing down the same path - where our investment priorities, bureaucratic habits and lax attitude towards costs are increasingly divorced from the real threats of today, the growing perils of tomorrow and the nation's grim financial outlook."

SecDef Robert Gates, 6 Jan 2011
“We can no longer afford to spend as if deficits don’t matter and waste is not our problem.”

“To sustain necessary investment levels . . . we must significantly improve the effectiveness and efficiency of our business operations. Doing so will increase funding . . . For our mission functions from savings in overhead, support, and non-mission areas.”

“We must therefore strive to achieve what economists call productivity growth: in simple terms, to DO MORE WITHOUT MORE . . . Drive productivity growth through Will Cost/Should Cost management.
USD(AT&L) Guidance

• USD(AT&L) launched BBP in 2010 to restore affordability and productivity to Defense spending

• BBP 1.0 challenges the way we think about our programs to achieve greater efficiency

• BBP 2.0 builds on this beginning to further install a culture of cost consciousness and increase procurement efficiencies

• BBP 3.0 strengthens and expands “should cost” as an important tool for cost management
Achieve Affordable Programs
- Continue to set and enforce affordability caps

Achieve Dominant Capabilities While Controlling Lifecycle Costs
- Strengthen and expand “should cost” based cost management
- Anticipate and plan for responsive and emerging threats by building stronger partnerships between the acquisition, requirements, and intelligence communities
- Institutionalize stronger DoD level Long Range R&D Planning
- Strengthen cybersecurity throughout the product lifecycle

Incentivize Productivity in Industry and Government
- Align profitability more tightly with Department goals
- Employ appropriate contract types, but increase the use of incentive type contracts
- Expand the superior supplier incentive program across DoD
- Increase effective use of Performance-Based Logistics
- Remove barriers to commercial technology utilization
- Improve the return on investment in DoD laboratories
- Increase the productivity of IR&D and CR&D

Incentivize Innovation in Industry and Government
- Increase the use of prototyping and experimentation
- Emphasize technology insertion and refresh in program planning
- Use Modular Open Systems Architecture to stimulate innovation
- Increase the return on Small Business Innovation Research (SBIR)
- Provide draft technical requirements to industry early and involve industry in funded concept definition to support requirements definition
- Provide clear “best value” definitions so industry can propose and DoD can choose wisely

Eliminate Unproductive Processes and Bureaucracy
- Emphasize Acquisition Executive, Program Executive Officer, and Program Manager responsibility, authority, and accountability
- Reduce cycle times while ensuring sound investments
- Streamline documentation requirements and staff reviews
- Remove unproductive requirements imposed on industry

Promote Effective Competition
- Create and maintain competitive environments
- Improve DoD outreach for technology and products from global markets
- Increase small business participation, including through more effective use of market research

Improve Tradecraft in Acquisition of Services
- Strengthen contract management outside the normal acquisition chain
- Improve requirements definition
- Improve the effectiveness and productivity of contracted engineering and technical services

Improve the Professionalism of the Total Acquisition Workforce
- Establish higher standards for key leadership positions
- Establish stronger professional qualification requirements for all acquisition specialties
- Strengthen organic engineering capabilities
- Ensure the DoD leadership for development programs is technically qualified to manage R&D activities
- Improve our leaders’ ability to understand and mitigate technical risk
- Increase DoD support for Science, Technology, Engineering, and Mathematics (STEM) education

Continue Strengthening Our Culture of:
Cost Consciousness, Professionalism, and Technical Excellence

Ideas retained from BBP 2.0
New in BBP 3.0
Effective November 15, 2010, you will establish “Should Cost” targets as a management tools for all ACAT I programs as they are considered for major MS decisions. As described in my September 14, 2010, Guidance to the acquisition workforce, “Should Cost” targets will be developed using sound estimating techniques that are based on bottoms-up assessments of what programs should cost, if reasonable efficiency and productivity enhancing efforts are undertaken. These costs will be used as a basis for contract negotiations and contract incentives and to track contractor and program executive officer/project manager performance.

By January 1, 2011, you will establish “Should Cost” estimates for ACAT II and III programs as they are considered for component MS decisions. You will use “Should Cost” – based management to track performance of ACAT II and III programs.
“...it is already clear to me that any serious effort to reform and reshape our defense enterprise must confront the principal drivers of growth in the Department's base budget – namely acquisitions, personnel costs, and overhead...

...despite pruning many major procurement programs over the past four years, the military's modernization strategy still depends on systems that are vastly more expensive and technologically risky than what was promised or budgeted for. We need to continually move forward with designing an acquisition system that responds more efficiently, effectively and quickly...

One that rewards cost-effectiveness and efficiency, so that our programs do not continue to take longer, cost more, and deliver less than initially planned and promised.”
Achieve Affordable Programs

Mandate affordability as a requirement: The initiative to provide affordability caps for unit production cost and sustainment costs was put in place two years ago and will continue. Affordability caps force prioritization of requirements, enabling cost trades and ensuring that programs which are currently too expensive in future budget to be affordable from continuing.

Control Costs Throughout the Product Lifecycle

Implement “should cost” based management: Should cost, the concept that our managers should set cost targets below independent cost estimates and manage with the intent to achieve them, is well on its way to becoming part of the DoD culture. This effort is fundamental to cost control and deserves continued emphasis. Proactively controlling cost is everyone’s business. Savings will continue to be applied as close to their origin as Service and Department priorities allow. Successful should cost management should be recognized and rewarded by the chain of command and by personnel system.

The basic goal of BBP...remains unchanged: deliver better value to the taxpayer and Warfighter by improving the way the Department does business.
A NEW ADMINISTRATION

• Nothing to indicate the pressure to identify and implement cost saving initiatives is going away
• Coincidental to the introduction of BBP, and Should Cost, the rate of cost growth for the major weapons systems has gone from over 9% in 2011 to 3.5% in 2015
• Nunn-McCurdy breaches are down and cost overruns have come down significantly.
• Even GAO has had positive things to say about BBP
SHOULD COST MOTIVATION

• Motivator #1
  • Data from last 30 years show that 80% of programs overrun their initial 50/50 independent cost estimates.

• Motivator #2
  • Programs are required to provide Should Cost analysis/documentation at Milestone reviews.

Solution: Conduct Should Cost analysis; establish a culture of savings and constraint; and reduce program costs if reasonable efficiency and productivity enhancing efforts identified by the Should Cost analysis are implemented.
Table 2. Milestone and Phase Information Requirements, continued

<table>
<thead>
<tr>
<th>INFORMATION REQUIREMENT</th>
<th>PROGRAM TYPE 1</th>
<th>PROGRAM TYPE 2</th>
<th>LIFE-CYCLE EVENT 2</th>
<th>SOURCE</th>
<th>APPROVAL AUTHORITY</th>
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<tbody>
<tr>
<td>PROGRAM CERTIFICATION TO THE DEFENSE</td>
<td>MDAP</td>
<td>MAUS</td>
<td>ACAT</td>
<td>10 U.S.C. 2222 (Ref. (g))</td>
<td>DBSMC Chair</td>
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<tr>
<td>BUSINESS SYSTEMS MANAGEMENT COMMITTEE (DBSMC)</td>
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<td>x III</td>
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<td>STA()TORY: for DBS programs only. Due prior to obligation of funds for any DBS that will have a total cost in excess of $1 million over the period of the current Future Years Defense Program.</td>
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<td>Program Protection Plan (PPP)</td>
<td>MDAP</td>
<td>MAUS</td>
<td>ACAT</td>
<td>DoDI 5200.39 (Ref. (a))</td>
<td>MDA</td>
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<tr>
<td>Regulatory. A draft update is due for the Development RFP Release decision and is approved at Milestone B. The PPP includes appropriate appendices or links to required information. See section 13 in Enclosure 3 of this instruction.</td>
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<td>REPLACED SYSTEM SUSTAINMENT PLAN</td>
<td>MDAP</td>
<td>MAUS</td>
<td>ACAT</td>
<td>10 U.S.C. 2437 (Ref. (g))</td>
<td>DoD Component</td>
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<td>STA()TORY: May be submitted as early as Milestone A, but no later than Milestone B. Required when an MDAP replaces an existing system and the capability of the old system remains necessary and relevant during fielding of and transition to the new system. The plan must provide for the appropriate level of budgeting for sustainment of the old system, the schedule for developing and fielding the new system, and an analysis of the ability of the existing system to maintain mission capability against relevant threats.</td>
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<td>Request for Proposal (RFP)</td>
<td>MDAP</td>
<td>MAUS</td>
<td>ACAT</td>
<td>Federal Acquisition Regulation Subpart 15.203 (Ref. (a))</td>
<td>MDA is release authority</td>
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<td>Regulatory. RFPs are issued as necessary, they include specifications and statement of work. See also Defense Federal Acquisition Regulation Supplement, subpart 221.170 (Reference (a)) for the requirement for peer review.</td>
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<td>Should Cost Target</td>
<td>MDAP</td>
<td>MAUS</td>
<td>ACAT</td>
<td>Para. 5d(3)(b)(1) of this instruction</td>
<td>MDA</td>
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<tr>
<td>Regulatory. <em>Should Cost</em> is a regulatory tool designed to proactively target cost reduction and drive productivity improvement into programs. Paragraph 6e in Enclosure 2 of this instruction provides additional detail on <em>Should Cost</em>.</td>
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<td>Spectrum Supportability Risk Assessment</td>
<td>MDAP</td>
<td>MAUS</td>
<td>ACAT</td>
<td>DoD4850.01 (Ref. (am))</td>
<td>Component CIO or designee</td>
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<td>STAt()ORY: Applicable to all systems/equipment that use the electromagnetic spectrum in the United States and in other host nations. Due at milestone reviews and prior to requesting authorization to operate (for other than testing) in the United States or in host nations.</td>
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Table Notes:
1. A dot (\(\cdot\)) in a cell indicates the specific applicability of the requirement to program type and life-cycle event, and represents the initial submission requirement. Moving right across a row, a checkmark (\(\checkmark\)) indicates the requirement for updated information.
2. All of the “Life-Cycle Events” will not necessarily apply to all “Program Types.”
3. Unless otherwise specified when discussed in this instruction, documentation for identified events will be submitted no later than 45 calendar days before the planned review.
4. Requires a Program Manager, PEO, and CAE-approved draft.
5. Information requirements that have been finalized and approved by the responsible authority in support of the Development RFP Release Decision Point do not have to be re-submitted prior to Milestone B unless changes have occurred. In that case, updated documents will be provided.
6. Incrementally Deployed Software Intensive Programs (Model #3) do not have a Milestone C and consequently are not required to satisfy the Table 2 requirements associated with that milestone.
SHOULD COST IN THE LCSP

- Life-Cycle Sustainment Plan (LCSP): primary program management reference governing operations and support planning and execution from MSA to disposal
- The LCSP Version 2.0 outline:
  - reflects changes to statute
  - clarifies previous guidance
  - expands the funding section to include
    - cost estimates
    - Should Cost initiatives
    - Affordability considerations
  - incorporate critical thinking questions
• Don’t accept the Will Cost (or baseline) as a self-fulfilling prophecy
• All program managers should *routinely analyze all cost elements* and look at reasonable measures to reduce them with prudent considerations of risks
• Don’t just expend the budget – get the best value for the $
• PM’s performance evaluation should consider effective cost control including implementation of should cost
• Should cost targets required for all ACAT I-III (services and products) programs
• ACAT I PMs and PEOs report should cost progress in DAES and DAB reviews
Cost control is a PM responsibility throughout the program lifecycle

- Different program types (weapon system, C4I, services) will have different opportunities
- Specific tools will differ depending on the phase
- Different functional domains will apply various cost control strategies, as appropriate, throughout the program lifecycle

Partner with your contractors, and challenge your team to find cost reductions
WHAT DOES IT ALL MEAN?

• Each Program Manager must establish a culture of savings and constraint

• **It's about cost analysis, not cost estimating and the setting of cost targets**

• Everyone on the PM’s team must become “Cost Warriors”
  – Skills include understanding of the operations context, communication, a savings mindset, business acumen, courage and thick skin, analytical skills, and a willingness to try new ideas*

• Each Program Office needs to look for options and alternatives that reduce costs

• Everyone needs to maximize the ROI for taxpayer dollars

* Reference: Am. Society of Military Comptrollers, June 2011, Annual Survey
WHAT IS SHOULD-COST?

Should-cost management as intended as part of BBP is not the same as the Should-cost review as defined in the Federal Acquisition Regulation/Defense Acquisition Regulation Supplement (FAR/DFARS) as they are very different.

The FAR/DFARS Should-cost review is typically undertaken when a program is entering production. This review is a manpower-intensive, in-depth review of contract for production processes and costs. A large team of engineers, production specialists, logisticians, and program managers perform the in-depth analysis.

The BBP "Should-cost" management approach is used throughout the program lifecycle as an ongoing effort. Additional information detailing the differences between should cost review and Should-cost management is covered in the next lesson.
• Affordability is the degree to which an acquisition program’s funding requirements fit within the service’s overall portfolio plan
  – Addressed at each milestone/decision point in a program’s life cycle;
  – Affordability metrics are expected to be met
  – Affordability will be treated LIKE a KPP

• Should Cost is different than affordability. Focus is on controlling costs to beat Independent Cost Estimate (ICE) or Program Office Estimate (which should already reflect affordability requirements)
  – Applied once the requirements, design, and affordability goals are established and an ICE or POE exists
  – Used to control program costs, but it should not keep us from making sound investments in product affordability

See DAG, Para. 10.15. Relationship of Affordability and Should Cost for more
WILL-COST VERSUS SHOULD-COST

**WILLCOST:** Establish Budget

- Developed by Non-Advocate Organization
- "Reasonable Extrapolation"
  - Continually updated with current available information for budget process
  - Normal conditions; average level of technical, schedule, and program risk
  - WHO
    - Program Offices
    - PEOs
    - Cost Staffs
    - SecAF
    - OSD
    - Congress
  - Normal business for program procurement support
  - Threshold for budgeting, APB, SAR, Nunn-McCurdy

**SHOULD-COST:** Drive Productivity

- Owned/executed by Program Manager
- "Scrutinize every element of cost"
  - Justify "each" element of program cost to develop a realistic price objective for negotiation purposes
  - Implementation of efficiencies, lessons learned & best practices
  - WHO
    - Program Offices
    - PEOs
    - Cost Staffs
    - SecAF
    - OSD
  - Will be developed by program teams with qualified expertise from cost estimating, technical, contracting, and logistics communities
  - Target for program management baseline execution and contract negotiation

"Margin" funds intended to be managed by CAE/PEO

Create a transparent, two-tiered cost, funding, and management approach using two separate cost estimates
“While ICE Will Cost analysis is valuable and credible, it does not help the program manager to drive leanness into the program. In fact, just the opposite can occur: the ICE, reflecting business-as-usual management in past programs, becomes a self-fulfilling prophesy.”

- Ashton B. Carter, USD(AT&L) Memo 14 Sep 2010
SHOULD COST CHALLENGES

• Program Will Costs are higher than their budget (Marks, resourcing issues at Milestone review)
  – Margin between Will Cost and Should Cost is a reduction in budget not a bankable reserve.
  – Many plausible Should Cost initiatives are included in the Will Cost in an attempt to achieve affordability.

• Recommendations
  – Programs should separately identify, thoroughly document and take credit for cost savings initiatives incorporated in the Will Cost
  – Margin will be calculated as Budget minus Should Cost, when Will Cost is greater than budget
    • Obviously negative margin will not be held in reserve
EVENT DRIVEN COST ESTIMATE REPORTING REQUIREMENTS

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<tbody>
<tr>
<td>MS A</td>
<td>Initial</td>
<td>Initial</td>
<td>N/A</td>
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<tr>
<td>MS B</td>
<td>Update</td>
<td>Update</td>
<td>Initial to Support Contract Actions (Optional)</td>
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<tr>
<td>MS C / LRIP 1 Contract Award</td>
<td>Update (Initial setting of Budget Baseline for Nunn-McCurdy metrics)</td>
<td>Update (Sets Internal Program Execution Baseline)</td>
<td>Optional (Refer to recommendations IAW FAR 15.407-4 and DFAR 215.407-4)</td>
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</table>

*Will Cost* estimates are the official program position for budgeting, programming, and reporting. The *Should Cost* estimate is an internal management tool for incentivizing performance to target.
SO WHERE DO YOU START?

• It’s not about which process you use, as long as it’s disciplined, uses sequential steps, and is repeatable
• Select a process that will work for your program and stick to it
• Monitor your progress
• Repeat your actions. This is an ongoing activity, not a one-time event.

Remember: Pick the process that works best for YOUR program
METHODOLOGIES ABOUND!

Align the process with program resources!

Enterprise AIRSpeed

A 7-Step Methodology for Discovering & Documenting SCIs
THE IMPORTANCE OF TEAMS

Team building and leading effective teams is critical to achieving our best acquisition outcomes.

DoD Directive 5000.01 requires the Department's acquisition community implement the concepts of Integrated Product and Process Development (IPPD) and Integrated Product Teams (IPTs) as extensively as possible, so as to simultaneously integrate all essential acquisition activities.

Used 18 times in DoD Instruction 5000.02
Over 100 chapters/sections in the DAG
CORE SHOULD COST IPT MAKEUP

- PM/DPM/APM (empowered representative)
- Business Financial Manager
- Cost Estimator
- Contracting
- Logistics
- Engineers
- Test Lead
- Contractors (Product/Product Support/Service Providers)
- Continuous Process Improvement Facilitator
- Industry Experts/Consultants
- Others as needed
# SHOULD COST PLANNING

## TEAM CHARTER

<table>
<thead>
<tr>
<th>Team Name:</th>
<th>Senior Stakeholder:</th>
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<tbody>
<tr>
<td><em>(Your Team Name Here)</em></td>
<td><em>(Who is the principle leader being supported by this effort)</em></td>
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<thead>
<tr>
<th>Project Name:</th>
<th>Period of Performance:</th>
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<td>Start Date: Completion Date:</td>
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**Team Purpose:** *(Why are you here)*

*Example: To identify and plan for cost reduction initiatives as part of an ongoing Should Cost Management effort.*

**Vision:** *(At a high level, define in one sentence what you're trying to achieve)*

*This is the vision for the team not the overall vision of the organization. They certainly should be aligned, but this goes to the end game of what the team is trying to accomplish.*

**Mission:** *(How will you achieve your vision and why is it important)*

*This mission statement relates to the vision above.*

<table>
<thead>
<tr>
<th>Project Description:</th>
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<tr>
<td><em>(Capture the essential performance requirements of your project or acquisition)</em></td>
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</table>

**Team Objectives:**

*(Define your key objectives that must be successfully accomplished to achieve your vision and mission requirements)*
**SHOULD COST MANAGEMENT PROJECT PLAN**

<table>
<thead>
<tr>
<th><strong>1.0 Form the Team</strong></th>
<th>Responsible</th>
<th>Target Due</th>
<th>Accountable</th>
<th>Consulted</th>
<th>Informed</th>
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<tbody>
<tr>
<td>1.1 Ensure senior management involvement and support</td>
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<td>1.2 Build the Team</td>
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<td>1.2.1 Appoint core team members (Program Manager or Project team lead, CO, COR, EN, JA, FM, etc.)</td>
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<td>1.2.2 Empower Team</td>
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<td>1.2.2.1 Vision statement, charter, MOU, etc.</td>
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<td>1.2.2.2 Develop rules of conduct</td>
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<td>1.2.2.3 Develop a preliminary project plan/projected timeline, and update regularly</td>
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<td>1.2.2.4 Document key tasks, action items, and schedule constraints, and update regularly</td>
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<td>1.2.3 Align workload to team members</td>
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<td>1.2.3.1 Tap multi-disciplinary expertise</td>
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<td>1.2.3.2 Define roles and responsibilities</td>
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<td>1.2.4 Identify gaps between workload and resources</td>
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<td>1.3 Identify stakeholders and nurture consensus</td>
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<td>1.3.1 Identify interests, objectives, and possible objections</td>
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<td>1.3.2 Identify additional team members (as required)</td>
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<td>1.4 Develop communication plans</td>
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<td>1.4.1 Refine communication plan</td>
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<td>1.4.2 Coordinate with MAJCOMs, DRUs, and FOAs</td>
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<td>1.4.3 Coordinate with Agency HQ</td>
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<td>1.5 Develop and maintain the knowledge base over the project life (create project library)</td>
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<td>1.6 Plan and schedule topical team training such as Risk/Opportunity Analysis, Process Improvement Tools, Decision Making Tools, Stakeholder Management, etc.</td>
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**2.0 Review Current Strategy**

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<thead>
<tr>
<th><strong>2.1 Identify current initiatives/contracts</strong></th>
<th>Responsible</th>
<th>Target Due</th>
<th>Accountable</th>
<th>Consulted</th>
<th>Informed</th>
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<tr>
<th><strong>7.6 Formulate plan for managing continuous improvement</strong></th>
<th>Responsible</th>
<th>Target Due</th>
<th>Accountable</th>
<th>Consulted</th>
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# SHOULD COST PLANNING

COMMUNICATION PLAN

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<thead>
<tr>
<th>PROJECT NAME:</th>
<th>VISION:</th>
<th>MISSION:</th>
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<tr>
<th>AUDIENCE</th>
<th>WHAT NEEDS TO BE COMMUNICATED</th>
<th>DESCRIPTION OF CONTENT</th>
<th>WHO IS RESPONSIBLE FOR GENERATION</th>
<th>TYPE OR FORMAT OF COMMUNICATION</th>
<th>FREQUENCY</th>
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CRITICAL THINKING

• The art of thinking about your thinking while you are thinking in order to make your thinking better

• Critical thinking is key to effective Should Cost Management
“One of the dominant characteristics of defense acquisition is its scope and complexity. There are no simple solutions to all the myriad problems acquisition professionals have to solve. There is no short “rule set” that will tell us all we need to know. Acquisition professionals have to be able to think on many levels, integrate inputs from many perspectives, balance competing needs, and satisfy many stakeholders and customers.”

Frank Kendall – Under Secretary of Defense (AT&L), Power 3.0 White Paper, 19 September 2014
Dangerous Opportunity
SO WHERE DO YOU START?

- It’s not about which process you use, as long as it’s disciplined, uses sequential steps, and is repeatable
- Select a process that will work for your program and stick to it
- Monitor your progress
- Repeat your actions. This is an ongoing activity, not a one-time event.

**Notional Process**

**Step 1:** Review program artifacts to identify cost drivers

**Step 2:** Conduct root cause analysis on cost drivers

**Step 3:** Identify and prioritize opportunities to address the root causes

**Step 4:** Develop POA&M for implementation

**Step 5:** Track and repeat process
STEP 1: REVIEW PROGRAM ARTIFACTS TO IDENTIFY COST DRIVERS

• Look for the majority of where funding is spent

• Where does the product/service provider spend the majority of your funding

• Look for historical cost drivers

• Look across the life cycle of the program for where bulk of the future cost will be spent
FOLLOW THE MONEY

Scrutinize each ingredient of program cost and justify it

- Using your cost baseline categorize by:
  - Appropriations
  - WBS
  - Life Cycle
- Within each category sort in descending order
- Focus on the few that drive most cost
- Understand the basis for the cost

Remember the WILL COST addresses research and development, procurement and investment, operations and support, and disposal costs. You should address all life cycle costs as well.
ADDITIONAL THINGS TO CONSIDER

• Where is the program in its lifecycle?
• What are the main cost drivers?
• Can you influence the cost?
• Determine what efficiency initiatives might be taken to reduce cost?
• Do you have to invest money to save money?
• Is the risk acceptable?
### WHAT ARE THE COST DRIVERS?

#### GXX PLCCE Costs by APPN/WBS - Risk Adjusted (PLCCE dated Oct 2011)

RDTE,DW (PMW 150 Funded, TY $K)

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Sort baseline by APPN, Cost, WBS, FY to identify potential areas for should cost savings!
AIM-9X Tactical Missile Unit Cost (USG Only)
(NCCA “Will Cost” Position)

All programs will not have the same cost drivers
Potential Cost Drivers

- Program complexity
- Requirements maturity
- Requirements stability
- Resource availability
- Funding stability
- Contract type
- Tech maturity
- Manufacturing maturity

- Competition
- Performance Risk
- Security Level
- Oversight requirements
- Delivery locations
- Production/Deployment rate
- Hazardous material
- Test methodology
STEP 2: CONDUCT ROOT CAUSE ANALYSIS ON COST DRIVERS

• Identify main cost drivers
• Why they are the majority of the spend?
• Are these cost drivers value added?
• Do these cost drivers trace back to a validated requirement?
• Are these causes within the control of the program or can at least be impacted by the program?
Common tools for root cause analysis

- Five Whys

- Cause and effect/Fishbone/Ishikawa diagram

- Value Stream Map (VSM)

- Quality Function Deployment (QFD)
CAUSE AND EFFECT -- FISHBONE

**Acquisition Strategy**
- Contract Type: FPIF (entire missile?)
- Base year extensions: Lot 11/12
- “True” Multi-year: Lot 14 – enabler for improved supplier / materials purchase efficiency e.g. high price metals: Titanium
- Common contract requirements / language
- Large Lot Procurement (LLP)
- Contract to Price, not by Element
- Contract Strategy/Type
- Consolidate shared support functions across multiple contracts: e.g. Production, Sustainment, SIP: e.g. government property management, SEPM, etc.
- Synchronize contract award timelines across multiple programs for shared suppliers, e.g. ATK – bundle shared sub-supplier awards for savings for both programs – assist sequencing of supplier factories and material

**Vendor Management**
- Lack Of Competition
  - Break out GFE versus prime contractor provided items (e.g. AOTD – late, FY16)
  - Promote supply chain management to encourage competition (Example: CNU-609A/E)
  - Data package ownership and data rights – is there benefit to USG owning or not owning data package?
- Supplier Management
  - Reduce overhead costs associated with supplier management
  - Reduce material burdens with suppliers
  - Re-use common parts from old missiles in new production vice building new
  - Vertically integrate suppliers
  - USG: Synchronize the CDRL / quality req’ts for parts across multiple USG customers
  - Strategize supplier purchase agreements: buy EOG / for multiple lots of parts when market price is right
  - Rationalize supply chain for major/complex subs
  - Random inspections/process QA
  - Incentives/Investment: “shared urgency with suppliers” and their awareness of Dr. Carter Initiatives

**Existing Workforce/Overhead**
- Reduce SEPM / Overhead
- Reduce support/touch labor ratio – look at trends over time
- Factory modernization: improve test equipment to reduce labor requirements

**Contract Negotiation Timeline**
- Target December Production Contract Award
- Accelerate production deliveries (12 mo.to 6 mo.)
- Package H/W ECPs (including CRI implementation) in 2 yr centers: Actively manage EMS Strategy
- Package HW ECPs in 2 yr centers. Actively manage EMS Strategy
- Bundle software ECPs in 2-3 centers (OF5.9.4)
- Replace IMU to improve reliability

**Support / Sustainment Strategy**
- Break up sustainment monopoly: alternate or multiple depot locations
- Improve existing depot leverage opportunities with production
- Pursue alternate Warranty / Repair Strategy
- Transportation process: allow shipment of warranty and non-warranty repairs on the same trucks, USN+USAFL
- Actively manage fleet use of missiles
- Transition to sectionalization
- Expand surveillance program
- CAIV performance requirements: MTBF tradeoffs
- Transition to tailored CATM maintenance
- Change requirements for reliability: CPD 550, observed reliability 1500. Change yield requirements to yield more parts but at reduced performance/reliability. Reduce TOC for sustainment
- Change CATM testing requirements: what can we ignore in CATM testing and what matters to reduce the sustainment costs for CATMs. Invest in OF5.0 to ignore failed parts that don’t matter
- Streamline process for contractor response to quality escapes (contractor must maintain a standing SEPM army to respond)

**Development Processes**
- Streamline software development processes

**Test Management**
- Test Data Analysis

**Schedule Management**
- Schedule Management

**Policy Issues**
- Streamline FRP / Milestone Process
- Align TPO and RMS Fridays off to same Fridays so we don’t lose a day of work every week

**Contractor Cost Structure**
- Reduce Fees
- Manage Profit
- Contractor Rates
- FRPA Process Change

**Contractor Cost Management**
- Integrated DT/OT (including future 9.4 SW/W)
- Maximize use of M&S
- Shared flight test with other platforms or programs
- Test Data Analysis

**Alternative Design, Material, and Technical Opportunities**
- AOTD
  - VECPs / Multiple discrete CRIs
- Missile
  - VECPs / Multiple discrete CRIs
- GU
  - VECPs / Multiple discrete CRIs
- Other
  - Package HW ECPs in 2 yr centers. Actively manage EMS Strategy
  - Bundle software ECPs in 2-3 centers (OF5.9.4)
  - Replace IMU to improve reliability

**Support Philosophy**
- ECP Management & Control
  - Design for architectural modularity and tailoring – to better support planned ECPs, CRIs, DMS, and EMS strategies
  - Change reliability requirements
  - Reduce AOTD performance requirements
  - Match production spec requirements to current production capabilities
  - Reduce requirements for CATM IMU

**Quality Control**
- Change software quality requirements targets (manage to requirements, avoid creep) – don’t build beyond what meets threshold
- Adequately decompose spec detail from source requirements. Balance quantitative and qualitative requirements

**Design for Architectural Modularity**
- CATM performance requirements: MTBF tradeoffs
- Transition to tailored CATM maintenance
- Change requirements for reliability: CPD 550, observed reliability 1500. Change yield requirements to yield more parts but at reduced performance/reliability. Reduce TOC for sustainment
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**ECPs/CRIs**
- VECPs / Multiple discrete CRIs

**Data Package Ownership**
- CAIV performance requirements: MTBF tradeoffs
- Transition to tailored CATM maintenance
- Change requirements for reliability: CPD 550, observed reliability 1500. Change yield requirements to yield more parts but at reduced performance/reliability. Reduce TOC for sustainment
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**Test Management**
- Streamline software development processes

**Schedule Management**
- Schedule Management

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STEP 3: IDENTIFY AND PRIORITIZE OPPORTUNITIES TO ADDRESS THE ROOT CAUSES

- Opportunity Management
- AFSO 21
- Lean/Six Sigma
- Total Quality Management
- Theory of Constraints
- Design for Affordability (DFA)
- Design for Manufacturing & Assembly (DFMA)

- Pick Chart
- QFD
- VSM
- Force Field Analysis
- Flow Charts
- Value Engineering
- Pareto
- Others

“It is tempting if the only tool you have is a hammer, to treat everything as a nail.”

Abraham Maslow
OPPORTUNITY MANAGEMENT

Through the opportunity management process, the program identifies potential enhancements to cost, schedule, and/or performance. Opportunities may be identified before program execution and should be sought across the program life cycle. Important sources of opportunities include system and program changes that yield reductions in total ownership cost. For example, adherence to a modular open systems approach or securing appropriate government rights to a technical data package can offer opportunities in sparing and competition for modifications. These cost reductions can be in research, development, test, and evaluation (RDT&E), production, and operations and maintenance (O&M) dollars throughout the life cycle.

Programs should not ignore opportunities with small improvements that can be obtained with minor effort and without program disruption. Aggregation of multiple smaller benefits may accrue to a larger program benefit.
Opportunities are potential future benefits to the program’s cost, schedule, and/or performance baseline, usually achieved through reallocation of resources. Risk and opportunity management support Better Buying Power initiatives to achieve “should-cost” as well as “will-cost” objectives. Figure 6-1 is a simple portrayal of how opportunity management and risk management help realize benefits for a program.

“... what became clearer to me is that Should Cost is very much like the Risk and Opportunity Management process industry and programs use, where the Opportunity represents specific efforts to reduce cost.”

RDML Becker
OPPORTUNITIES HELP DELIVER SHOULD-COST OBJECTIVES

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<td>4</td>
<td>Highly Likely</td>
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<td>3</td>
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**Cost**

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<th>Schedule</th>
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<td>5</td>
<td>Significant cost benefit of &gt;$W; or reduces costs by &gt;q% of budget</td>
<td>Significant cost benefit of &gt;$C or; reduces production unit cost by &gt;q%</td>
<td>Significant cost benefit for O&amp;M savings</td>
<td>Exceptional benefit in meeting major milestones and improving critical path</td>
<td>Exceptional benefit to design margin, system performance and requirements</td>
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<tr>
<td>4</td>
<td>Major cost benefit $Z - &lt;$W; or reduces costs by p% - q% of budget</td>
<td>Major cost benefit of $C - &lt;$D or; reduces production unit cost by p% - q%</td>
<td>Major cost benefit for O&amp;M savings</td>
<td>Major benefit in meeting major milestones and improving critical path</td>
<td>Major benefit to design margin, system performance or requirements</td>
</tr>
<tr>
<td>3</td>
<td>Cost benefit of SY - &lt;$Z; or reduces costs by n% - q% of budget</td>
<td>Moderate cost benefit of $B - &lt;$C or; reduces production unit cost by n% - q%</td>
<td>Moderate Cost benefit for O&amp;M savings</td>
<td>Moderate benefit in meeting major milestones</td>
<td>Moderate benefit to design margin, system performance or requirements</td>
</tr>
<tr>
<td>2</td>
<td>Minor cost benefit of S$X - &lt;$Y; or reduces costs by m% - n% of budget</td>
<td>Minor cost benefit of $A - &lt;$B or; reduces production unit cost by m% - n%</td>
<td>Minor cost benefit for O&amp;M savings</td>
<td>Minor benefit in meeting lower level milestones</td>
<td>Minor benefit to design margin, system performance or requirements</td>
</tr>
<tr>
<td>1</td>
<td>Minimal cost benefit of &lt;$X; or reduces costs by &lt;m% of budget</td>
<td>Minimal cost benefit of &lt;$A or; reduces production unit cost by &lt;.5%</td>
<td>Minimal cost benefit for O&amp;M savings</td>
<td>Minimal benefit to improving overall schedule</td>
<td>Negligible benefit to design margin, system performance or requirements</td>
</tr>
</tbody>
</table>
**OPPORTUNITIES**  
(Life Cycle Perspective)

<table>
<thead>
<tr>
<th>Materiel Solution Analysis</th>
<th>TMRR</th>
<th>EMD</th>
<th>Production</th>
<th>O&amp;S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordability is Prime</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Should Cost is Prime</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PM**
- AoA
  - Look for opportunities to inject competition and ways to maintain competition throughout the lifecycle
  - Reconstruct the program team (Gov't & KTR) for efficiency and streamlining
  - Disciplined RASCI
  - Trade-Off Analysis
  - Partner with your contractor(s) – motivate them to reduce costs
  - ID items or services contracted through 2nd or 3rd party vehicles; consider other options
  - Benchmark against similar DoD programs, commercial analogues, programs by same KTR
  - Track recent program cost, schedule, and performance trends and identify ways to reverse negative trend(s)
  - Examine OGC closely - especially A&AS/SETA costs & look for Gov't sourcing (labs, DCMA,...)
  - Consider economic order quantities

**IPT Discipline**

**CON**
- FAR Should Cost - Negotiations
  - CDRL Reduction - is every deliverable necessary? Who uses each one?
  - ID opportunities to breakout separate small business or GFE items/services
  - Build in contract provisions for potential off-ramps and partial transitions
  - Pursue contract type(s) appropriate to risk
- Carefully structure contract incentives to control costs and incentivize program priorities and cost reductions

**Should Cost is a PM Responsibility - but a multifunctional team effort**
## OPPORTUNITIES
### (Life Cycle Perspective)

<table>
<thead>
<tr>
<th>Material Solution Analysis</th>
<th>TMRR</th>
<th>EMD</th>
<th>Production</th>
<th>O&amp;S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affordability is Prime</strong></td>
<td><strong>Should Cost is Prime</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LOG</strong></td>
<td>Promote supply chain management to encourage competition and incentivize cost performance at lower tiers</td>
<td>Look for supply and parts similarity within the service and DoD</td>
<td>Strongly consider PBL support contract relationships</td>
<td>Optimize On-Call support hours</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TEST</strong></td>
<td>Utilize integrated DT/OT</td>
<td>Look for opportunities to utilize Gov’t ranges &amp; test facilities/organizations rather than KTRs</td>
<td>Look to utilize modeling and simulation to reduce testing req’ts</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BFM</strong></td>
<td>Exercise Travel Discipline (both Gov't and KTR)</td>
<td>Seek KTR cost reductions/consideration due to Gov't progress payments</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
OPPORTUNITIES
(Life Cycle Perspective)

<table>
<thead>
<tr>
<th>Materiel Solution Analysis</th>
<th>TMRR</th>
<th>EMD</th>
<th>Production</th>
<th>O&amp;S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordability is Prime</td>
<td></td>
<td></td>
<td>Should Cost is Prime</td>
<td></td>
</tr>
<tr>
<td>BFM (con’t)</td>
<td></td>
<td></td>
<td>Pricing, cost estimating</td>
<td></td>
</tr>
<tr>
<td>Consider cost share arrangements to incentivize savings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Challenge the basis for indirect costs in contractor proposals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGR</td>
<td></td>
<td></td>
<td>Identify alternative materials / technologies that could reduce development or life cycle costs</td>
<td></td>
</tr>
<tr>
<td>Obtain GPR Data Rights in a competitive environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consider exportability features early to save design costs later</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enforce Open System Architectures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pursue Agile vs. Traditional software design practices</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Conduct engineering root-cause analyses to look for the cause of cost drivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
<td>Carefully consider security requirements levied on the KTR – what does the program really need?</td>
<td></td>
</tr>
<tr>
<td>Others?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each program is different - where can you find costs to eliminate?
Analyze and prioritize the list of Should Cost initiatives if necessary. Decide which initiatives to pursue first, second, and so on, dependent upon available resources.
Each of the eleven initiatives was analyzed based on: Investment Cost, Operational Impact, Implementation Effort, Implementation Timing, and Estimated Benefits.

### INITIATIVE COMPARISON TABLE (IAMD Sample)

<table>
<thead>
<tr>
<th>#</th>
<th>Initiative</th>
<th>Estimated Investment Cost</th>
<th>Operational Impact (to soldier, compared to current design)</th>
<th>Implementation Effort Required (Level of Effort)</th>
<th>FY Year of Implementation</th>
<th>Estimated Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CBRN/ABT Alarm</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>EOC Generator/ECU/Trailer Choice [DP 1]</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>13</td>
<td>$1.67M</td>
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<tr>
<td>3</td>
<td>EOC Prime Mover/Shelter/Generator/ECU/Trailer Choice [DP 2]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$306K</td>
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<tr>
<td>4</td>
<td>Portable Timing Unit Removal</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>12</td>
<td>$272K</td>
</tr>
<tr>
<td>5</td>
<td>Weapons Rack Removal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$1.28M</td>
</tr>
<tr>
<td>6</td>
<td>IPT/WG Structure: Non-Contract-Change (e.g. Charter, Re-Org)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>12</td>
<td>Unquantifiable</td>
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<tr>
<td>7</td>
<td>EOC Generator Change</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>12</td>
<td>$272K</td>
</tr>
<tr>
<td>8</td>
<td>EOC ECU Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>EOC Trailer Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>EOC Shelter Change</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>13</td>
<td>$1.28M</td>
</tr>
<tr>
<td>11</td>
<td>Decrease Number of Generators Required</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>12</td>
<td>$680K</td>
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</tbody>
</table>

#### Investment Cost

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
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<tbody>
<tr>
<td>0-$100,000</td>
<td>5</td>
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<tr>
<td>$100K-250K</td>
<td>4</td>
</tr>
<tr>
<td>$250K-500K</td>
<td>3</td>
</tr>
<tr>
<td>$500K-$1M</td>
<td>2</td>
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<tr>
<td>&gt;$1M</td>
<td>1</td>
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</tbody>
</table>

#### Operational Impact

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>High positive impact</td>
<td>5</td>
</tr>
<tr>
<td>Low positive impact</td>
<td>4</td>
</tr>
<tr>
<td>No impact</td>
<td>3</td>
</tr>
<tr>
<td>Low negative impact</td>
<td>2</td>
</tr>
<tr>
<td>High negative impact</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Implementation Effort

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Easy</td>
<td>5</td>
</tr>
<tr>
<td>Somewhat easy</td>
<td>4</td>
</tr>
<tr>
<td>Neutral</td>
<td>3</td>
</tr>
<tr>
<td>Somewhat Difficult</td>
<td>2</td>
</tr>
<tr>
<td>Very Difficult</td>
<td>1</td>
</tr>
</tbody>
</table>
INITIATIVES BY BEST VALUE

Net Benefit ($K) vs. Evaluation Criteria Score

- Best Value
- Less Benefit for Cost/Effort
- Difficult & Low Value

1. A-Kit Design Implementation Contract
2. LTPO/IAMD Combined Testing
3. Elimination of second LOG DEMO
4. Remove Cross Domain Solution
5. Other LoE Support
6. Contractor Data for Resp Verification
7. Util. of existing data networks
8. SIPR/NIPR over IFCN
9. Reduce Raytheon A-Kit SE LOE
10. Requirements Verification by Analysis
11. CBRN/ABT Alarm
12. EOC Gen/ECU/Trailer Choice [DP 1]
13. Reduce/Eliminate Formal V2 Testing
14. Use of Emulators
15. Other Contractor Support
16. EOC Trailer Change
17. EOC Pr/Mo/Sh/Gen/ECU/Tr Ch [DP 2]
18. EOC Shelter Change
19. Overhead Cost Fees
20. Use MEF Gen, Std Army Trailer, ECU
21. Combine SRS & IRS Documents
22. Combine SDD & IDD Documents
23. Delete CIDS from IBCS Spec Tree
24. GFX (15% Reduction)
25. Reduce scope for FY13 Demo
26. Reduce the amt of FSR Support
27. IFC Network Planner
28. Integrated Def. Designer (IDD) Dev
29. Decrease # of Generators Req’d
30. Use Non-Ruggedized Parvus Switch
31. Reduce # Warfighter Events for 3.0
32. Delete HEMP Requirement
33. Eliminate Warfighter Evt for Bld 3.1
34. Portable Timing Unit Removal
35. Change High Altitude Requirement
36. EOC Generator Change
37. Remove JLENS Specific capabilities
38. Reduction in NG CDRLs
39. Reduce # of CIV/NI St Guide Updates
40. Remove Over-the-air SW Update Req
41. EOC ECU Change
42. Weapons Rack Removal
43. Place copper connections on relay
PRIORITIZE INITIATIVES (AIM-9X)

**Investment Cost**
- **Lowest cost:**
  1. AOTD Spreader Lens Improvement
  2. Improve nLight AOTD Laser Solder Fixtures
  3. nLight AOTD Start Pulse CCA Ownership
  4. AOTD Microchip Laser Crystal STE
  5. Automated AUR Test at FACO
  6. Accelerate Lot 11 Production Deliveries
  7. Accelerate Lot 12 Production Deliveries
  8. Lot 11 Contract: FPIF (AOTD)
  9. Lot 12 Contract: December Option / FPIF (AOTD)
  10. FY14 Multi-Year Contract

**Ease Of Implementation**
- **Easiest:**
  1. AOTD Spreader Lens Improvement
  2. AOTD Laser Yield / Test Automation Assembly Improvement
  3. nLight AOTD Start Pulse CCA Ownership
  4. AOTD Microchip Laser Crystal STE
  5. AOTD STE/TE: Fiber Cleave Test Equipment
  6. Accelerate Lot 11 Production Deliveries
  7. Lot 11 Contract: FPIF (AOTD)
  8. Lot 12 Contract: December Option / FPIF (AOTD)
  9. Reduce SEPM/Overhead
  10. Automated AUR Test at FACO

**Time to Implement / Realize**
- **Quickest:**
  1. AOTD Spreader Lens Improvement
  2. AOTD Laser Yield/Test Automation Assembly Improvement
  3. nLight AOTD Start Pulse CCA ownership
  4. AOTD Microchip Laser Crystal STE
  5. AOTD STE/TE: Fiber Cleave Test Equipment
  6. Accelerate Lot 11 Production Deliveries
  7. Lot 11 Contract: FPIF (AOTD)
  8. Accelerate Lot 12 Production Deliveries
  9. Lot 12 Contract: December Option / FPIF (AOTD)
  10. Reduce SEPM/Overhead

**Combined Pareto: Overall Effort Required**
- **Overall least effort:**
  1. AOTD Spreader Lens Improvement
  2. nLight Start Pulse CCA ownership
  3. AOTD Microchip Laser Crystal STE
  4. Accelerate Lot 11 Production Delivery
  5. Lot 11 Contract: FPIF (AOTD)
  6. AOTD STE/TE: Fiber Cleave TE
  7. Reduce SEPM/Overhead
  8. Supplier Cost Reduction Urgency
  9. Lot 12 Contract: December Option / FPIF (AOTD)
  10. Automated AUR Test at FACO

---

**Bar Color Key:**
- Major Fishbone Cost Areas
- Acquisition Strategy
- Alternative Design, Material, Tech Opportunities
- Test Management
- Support/Sustainment Strategy
- Program Management

**Line / Markers Color Key:**
- Black = Program-Driven Initiative
- Red = Externally-Driven Initiative
PRIORITIZE INITIATIVES

Unit Cost Benefit

Highest Unit Cost Benefit:
1. Accelerate Lot 11 Production Deliveries
2. Accelerate Lot 12 Production Deliveries
3. FY14 Multi-Year Contract
4. Lot 11 Contract: FPIF (AOTD)
5. AOTD Laser Yield/Test Assembly Automation
6. AOTD Spreader Lens Improvement
7. Lot 13 Contract: FPIF (entire missile)
8. Mini EU Processor Stack
9. Replacement CAS
10. Lot 12 Contract: December Option / FPIF (AOTD)

Combined Pareto Effort & Benefit

Highest Combined Pareto Effort & Benefit
1. Accelerate Lot 11 Production Deliveries
2. Accelerate Lot 12 Production Deliveries
3. Lot 11 Contract: FPIF (AOTD)
4. AOTD Spreader Lens Improvement
5. AOTD Laser Yield/Test Assembly Automation
6. Lot 12 Contract: December Option / FPIF (AOTD)
7. FY14 Multi-Year Contract
8. nLight Start Pulse CCA Ownership
9. AOTD Microchip Laser Crystal STE
10. Reduce SEPM/Overhead
PRIORITIZE INITIATIVES

PRODUCTION Opportunities: Benefit vs. Effort
(Technical Investment Initiatives Only)

Increment 1: Lot 11
Should Cost

Increment 2: Lot 12
Should Cost

Increment 3: Lot 13
Should Cost

Increment 4+: Lot 14+
Should Cost

Overall Effort Required (Combined Investment Cost/Time/Difficulty)
Higher = Harder, Longer, Or More Costly

Incremental Benefit: Estimated Unit Cost ROI $8Y11 K

AOTD Laser Yield / Test Automation Assembly Improvement
AOTD Spread Lens Material/Shape Improvement
Mini EU Processor Stack
Replace CAS
Affordable CATM 2: Hardware Optimization
nLight Start Pulse (SP) CCA Ownership
Replace IMU for Reliability
Affordable CATM 1: Optimize CATM BIT
AOTD Data Link Test Equipment Upgrade
Cryoengine Seal Improvement
AOTD Microchip Laser Crystal Special Test Equipment
Improve ELCAN AOTD Transceiver Yield
AOTD Vibe Station Upgrade
Automated AUR Test at FACO
AOTD STE/TE: Fiber Cleave Test Equipment
Automate nLight AOTD Laser Test Station
Improve nLight AOTD Laser Solder Fixtures
AOTD Inner Housing Assembly Test Equipment
Factory Modernization
PICK CHART

Implement (Just Do It)

Low - Payoff - High

Possible

Easy - Difficulty - Hard

Challenge

Kill
Select the Right Cost Estimating Technique

- Analogous
- Parametric
- Engineering/Bottoms-up
- Actuals
- Expert Opinion
## Capture the Data (IA MD Sample)

<table>
<thead>
<tr>
<th><strong>Date:</strong></th>
<th><strong>POC:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiative:</td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
</tr>
<tr>
<td>Estimated Savings to the Program:</td>
<td></td>
</tr>
<tr>
<td>Estimating Methodology:</td>
<td></td>
</tr>
<tr>
<td>Investment cost:</td>
<td></td>
</tr>
<tr>
<td>Operational Impact:</td>
<td></td>
</tr>
<tr>
<td>Implementation Effort:</td>
<td></td>
</tr>
</tbody>
</table>
Date: 04/30/2012  POC: Tom Nguyen

Initiative: Use of Non-Ruggedized Parvis Switch

Description:

The Parvus switch is being used in the IFCN Relay and EOC. This switch is ruggedized as part of the original design in order to meet IBCS environmental requirements. However, as part of ECP3, the original design was no longer valid. Current IFCN design utilizes the Network Enclosure designed to meet IBCS Environmental requirements. The Parvus switch is housed inside the Network Enclosure, which the ruggedizing is not needed. By having just the CISCO switch housed inside the Network Enclosure will eliminate the ruggedizing cost. No savings anticipated for RDT&E due to NGC has purchased the Parvis switches for RDT&E. Cost are sunken between 2012 and 2014. Not much cost savings in early years, but savings accrued in the out years.

Estimated Savings to the Program:  
FY15 = 120K & LCC = $3M

Estimating Methodology: 3M

- Parvus Switch Cost = Cost of Cisco Switch ($4K) + Cost of Hardening the CISCO Switch ($7K)
- Cost Reduction Opportunity: Cost of Hardening the CISCO Switch ($7K)
- Total Cost Reduction: 431 (EOC) * 7K = $3M. See table below for cost per year starting 2015.

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Procurement Quantity</td>
<td>17</td>
<td>14</td>
<td>62</td>
<td>45</td>
<td>50</td>
<td>51</td>
<td>50</td>
<td>41</td>
<td>43</td>
<td>35</td>
<td>23</td>
<td>431</td>
<td>$3M</td>
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<tr>
<td>Savings ($M)</td>
<td>0.12</td>
<td>0.1</td>
<td>0.43</td>
<td>0.31</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
<td>0.29</td>
<td>0.3</td>
<td>0.24</td>
<td>0.16</td>
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</tr>
</tbody>
</table>
ESTABLISH MEASURABLE TARGETS

**Example**

**Increment 1:** CRIs already in FY11 Will-Cost:
1. AOTD Spreader Lens Improvement
2. AOTD Laser Yield/Test Automation
3. nLight Start Pulse CCA Ownership
4. AOTD Microchip Laser Crystal STE
5. AOTD STE/TE: Fiber Cleave TE

**Increment 1:** In FY11 Should Cost
1. Accelerate Production Deliveries (Lot 11)
2. Lot 11 Contract: FPIF (AOTD)

**Increment 2:** In FY12 Should Cost
1. Accelerate Production Deliveries (Lot 12)
2. Lot 12 Contract: Dec. Option / FPIF (AOTD)
3. Reduce SEPI/Overhead (5%)  
4. Automated AUR Test at PACO
5. AOTD Data Link Test Equipment Upgrade
6. AOTD Vibe Station Upgrade
7. AOTD Inner Housing Assembly TE

**Increment 3:** In FY13 Should Cost
1. Lot 13 Contract Type: FPIF
2. Consolidate Shared Contract Support Fns
3. Match Production Spec to Capabilities
4. Improve nLight AOTD Laser Reclaim
5. Improve nLight AOTD Laser Solder Fixtures
6. Automate nLight AOTD Laser Test Station
7. Improve ELCAN AOTD Transceiver Yield
8. Cryoengine Seal Improvement

**Increment 4:** In FY14 Should Cost
1. FY-14 Multi-Year Contract
2. Package HW ECPs in 2 yr centers
3. Sync Contract Award Timelines
4. Contract to Price, not by Element
5. Sync Parts quality reqts across USG cost
6. Streamline KTR response to quality escapes
7. Reduce AOTD performance requirements
8. Bundle vendors: datalink, rocket motor

**Increment 5:** In FY15 Should Cost
1. Supply Chain Management for Competition  
   (RMS. in conjunction with FY14 Multi-Year,  
   realize savings in FY15)
   1. Affordable CATM 1: Optimize CATM BIT
   2. Affordable CATM 2: CATM H/W Optimization

**Increment 6:** FY16+ Should Cost Reduction Contributors
- Some invested during FY11-FY15 but not yet realized since they are long-term, strategic projects:
  1. Common Contract requirements / language
  2. Streamline Software Development / Reduce Quality Escapes
  3. Contract to Price, not by element

**Leverage with Block III program:**
4. Low Cost AOTD  
5. Mini EU Processor Stack (also obsolescence, started in FY13)
6. Replacement CAS
7. Replace IMU for Reliability (invest earlier if $$ permit)
8. Reduced Cost NCOC Dome
9. Factory Modernization
ESTABLISH MEASURABLE TARGETS

EXAMPLE

- **Description:** Utilize contract incentives to achieve efficiencies in software development

- **Assumptions**
  - Will Cost = $6M: Estimated Ceiling for Total Value of S/W Development Contract; reflects cost and schedule incentive targets not being achieved, based on Independent Government Cost Estimate
  - Should cost estimate assumes moderate incentive achievement (final delivery on schedule, 2% under cost target)
  - Savings will occur in FY13 when contract incentives are determined and funded

- **Methodology**
  - Input parameters associated with expected contractor performance (final delivery on schedule, 2% under cost target) to estimate total contract costs associated with this performance

- **Data Sources**
  - PMO XXX Contract Team’s Contract Pricing
  - APM input assumed contractor performance

- **Calculations**

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>FY13 TY$K</th>
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<tr>
<td>Ceiling Value (Will Cost)</td>
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<td>On Schedule, At Target Cost</td>
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<td>On Schedule, 1.5% under Target Cost</td>
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<td>On Schedule, 2% under Target Cost</td>
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<td>On Schedule, 5% under Target Cost</td>
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</table>
STEP 4: DEVELOP POA&M FOR IMPLEMENTATION

• Allocate/time-phase cost reduction initiatives
• Generate Initial POA&M in technical and non-technical subcategories
• Reconcile POA&Ms into a combined, program-level POA&M and should-cost strategy

Remember this is also about Change Leadership
### STEP 4: DEVELOP POA&M FOR IMPLEMENTATION

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<tr>
<th>Increment</th>
<th>Title</th>
<th>FY11 (120 units)</th>
<th>FY12 (186 units)</th>
<th>FY13 (229 units)</th>
<th>FY14 (242 units)</th>
<th>FY15 (247 units)</th>
<th>FY11-FY15 savings (PB12 quantities)</th>
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<td>Reduce SEP/M/Overhead</td>
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<td>Automated AUR Test at FACO</td>
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<td>AOTD Data Link Test Equipment Upgrade</td>
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<td>AOTD Vibe Station Upgrade</td>
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<td><strong>Increment 3</strong></td>
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<td>Absorb &quot;cost&quot; in regular production contract negotiation.</td>
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<td>Consolidate Shared Support Functions Across Contracts</td>
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<td>Replace IMU for Reliability</td>
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<th>Total Investment and Total Per-Unit Savings</th>
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<th>90.2</th>
<th>2000</th>
<th>63.1</th>
<th>2000</th>
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<th>93.1</th>
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<th>81.8</th>
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Lot 11 RM5 Contractual Position Offset: -58.0

"Will Cost" $Y: 712.0 612.2 572.9 632.4 630.5

"Should Cost" $Y: 672.8 549.0 528.9 534.3 527.8

In FY13, leveraging Block III program investment.
STEP 5: TRACK AND REPEAT PROCESS

- It is extremely important to validate implemented cost reduction initiatives in order to determine what benefits were actually realized and compare efforts to outcomes.
- Establish proven practices and lessons learned
- Necessary for reporting to OSD
STEP 5: TRACK AND REPEAT PROCESS

• Continue aggressive cost reduction and effective negotiations to achieve additional savings

• Reapply “Should-Cost” methodology to other appropriation types across the life cycle and quantify the savings

• Ensure long term should cost success (periodic reviews to feed into contract negotiations) to produce consistent unit cost reduction across the product life cycle

• Identify potential for broader application
OPPORTUNITIES TO UPDATE SHOULD COST TARGETS

- In preparation for, or immediately following, Critical Design Review
- First LRIP award out of option contracts; in particular, in cases where option production contracts were awarded as part of the development contract award
- Interim Contractor Support and Contractor Logistic Support first contract awards
- In conjunction with a sustainment BCA
- At a minimum, any update to the Will Cost
- FAR/DFARS indirect/direct cost reviews
OTHER CONSIDERATIONS

- Reinvestment
- Reporting requirements
- Waivers
REINVESTMENT OF SHOULD COST SAVINGS

• The Service determines how the cost savings will be used (in some cases Service have delegated the decision to subordinate organizations)
  • It can be left with the program to be used at the discretion of the Program Manager
  • It can be reprogrammed to a higher priority program

USD AT&L has never taken should cost savings from a program
SHOULD COST AND SUSTAINMENT

• Frank Kendall acknowledged we have not yet done enough to address long term sustainment costs
• David Berteau said Should Cost has worked well on standard systems and acquisition, but said the focus now needs to be on “the services industry, for logistics, for sustainment – that’s much tougher . . .”
Acquisition Workforce access – CAC enabled
Tools and Techniques

Should Cost at Work
$3.6M savings using FRC vs. OEM for ECP 4034 installs (MH-60)

Competition for common commercially available spares (P-8)

Stand-up of I-Level Maintenance for Top Cost drivers which include ESM, sonobuoy system currently (P-8)

Engine Time-On-Wing. An ECP for a Measured Gas Temperature Increase in the engines has nearly doubled Engine Time-On-Wing, which significantly reduces the number of shop visits and will avoid as much as $1B in repair costs over the program life cycle. In addition, the increased reliability has reduced the number of required spares eliminating the need to procure 16 new engines for the production line, saving $28M in FY13 procurement costs. (V-22)
P^{2}L^{2} EXAMPLES

• Joint Performance Based Logistics (JPBL). The PBL contract incentivizes reductions in maintenance time, i.e., Repair Turn Around Time (RTAT) and numbers of Technical Assist Requests (TARs), which has resulted in an initial cost reduction of 26%. (V-22)

• Support Equipment. The PMA, via Lakehurst, has issued competitive Support Equipment contracts, vice the original strategy of outsourcing to OEMs, saving ~$14.7M in FY13 with additional savings expected in the FYDP. (V-22)

• Component Repair. The PMA worked with NAVSUP to “Break Out” contracts for component repair. 102 components were broken away from aircraft primes and contracted directly with suppliers (component OEMs), with additional components planned by end of FY14, resulting in an average of 56% reduction in RTAT and ~26% in cost savings to date. (V-22)
Planed Longer Technical Refresh Intervals. IT-intensive system with required periodic technical refreshes to stem the effects of obsolescence and maintain its Authority to Operate. Usual tech refresh rate for IT-intensive systems is about every 3 years. The Program Office extended the tech refresh by two years to a five year cycle with the rationale that processor and operating systems remain supported by vendors even with longer refresh intervals. This action yielded $20.7M in O&M savings. (CAC2S MAIS)

Reuse excess Mk21 aeroshells (inspected and determined to be in pristine condition) as the design configuration for warheads in the W78/88-1 warhead life extension program. The same “mold line” for both warheads allows the use of the same fuze, which avoids non-recurring engineering costs for the second configuration. Can “spare” either warhead, which reduces the quantity required, which can save even more money. (ICBM)
POTENTIAL SHOULD COST INITIATIVES

- Tech insertion/Alternate Technologies/Material
- Reduce overhead
- Pass-through costs
- Supply Chain Management
- PBL
- Commonality of parts/tools/support equipment/etc.
- Modeling/Simulation
- Competition/2nd Source
- Test and evaluation
- Contracting strategy
- Simplify design
- GFE breakout
- MYP/EOQ/Tandem buys
- Reduce Change Orders
- CPI
- Reliability Improvements
- CBM/RCM
- DMSMS
More than half of the guidebook content is devoted to Should Cost.

The guidebook specifies the following enablers for Should Cost:
- Competition
- PBL
- Use of WCF
- Process Improvement

Trade decisions early on
The majority of O&S costs are determined early in the lifecycle, during the design process, but those costs are realized later in the lifecycle.

- Typical O&S Cost Determination
- Notional
- Sustainment/O&S Spend Profile
1. Establish O&S Cost as a TPM

2. Identify O&S Requirement Drivers

3. Identify and Allocate O&S Cost Design Parameters

4. Control and Verify O&S Cost TPM and Drivers
Reduce O&S cost by identifying and capitalizing on opportunities identified in the current sustainment architecture.

**Requirement**

**Analysis**

**Maintenance Practices**
- Review current operational maintenance practices and identify areas of opportunity for improving maintenance practices and/or reducing O&S cost.

**Maintenance Planning**
- Apply actual failure data to current maintenance plans.
- Investigate opportunities to turn high cost consumables into repairables.
- Investigate if additional repair capability is warranted.

**Repair Capability**
- Document current repair capability at Intermediate and Depot levels.
- Engage Depot/Unit personnel to implement Beyond Capability of Maintenance (BCM) interdictions and better utilize Intermediate level capability.

**Supply Chain Strategies**
- Review impacts to customer wait time and other key supply chain management performance indicators and identify opportunities to implement PBL contracts and to breakout to the Original Equipment Manufacturer (OEM) (rather than Prime).

**Action**

**Reporting**

- Document Plans
- Monitor Improvement Efforts
- Remove Barriers
- Drive Results

Track O&S costs by establishing a battle rhythm for metrics reviews.
Product Support Elements

- Product Support Management
- Design Interface
- Sustaining Engineering
  - Supply Support
  - Maintenance Planning and Management
  - Packaging, Handling, Storage and Transportation
  - Technical Data
  - Support Equipment
  - Training and Training Support
  - Manpower and Personnel
  - Facilities and Infrastructure
  - Computer Resources

CAPE Cost Categories

- 1.0 Unit-Level Manpower
- 2.0 Unit-Level Operations
- 3.0 Maintenance
- 4.0 Sustaining Support
- 5.0 Continuing System Improvements
- 6.0 Indirect Support

Appropriations

Availability/Downtime
Example IPS Decomposition

• IPS Element Supply Support

• Focus areas:
  – Supply Chain Management
  – Forecasting
  – Initial Provisioning
  – Procurement
  – Inventory Management
  – Selected DoD and DoD Component – Unique Supply Systems and Tools

• Supply Chain Management Key O&S Considerations
  – Receiving / Issuance / Transfer / Redistribution;
  – Buffer stock, safety stock, war reserve;
  – Munitions storage and transportation management;
  – TAV / ITAV requirements (SIM, IUDI, RFID);
  – Requirements to provide asset visibility in Govt system of record
Cost drivers that the PM controls fall into two categories:

- **Design factors:** reliability, diagnostics, fuel efficiency, and maximum speed. Design factors include CDD or CPD requirements, as well as derived design parameters that may be in the proposal evaluation criteria, contract requirements, or lower-level cost allocation.

- **Non-design factors:** core logistics capability requirements to include depot maintenance, supply chain performance, and transportation.
QUESTIONS TO CONSIDER

In the world of product support, we need to ask ourselves:

• Why is it needed?
• Why are we doing it that way?
• Is there a better way to do it?
• What reasonable measures might reduce it?
• Can we do things differently and achieve the same results?
• Are there steps we can eliminate?
• Can we drive down costs with incentives?
• How have other programs done it?
Consider your program, identify at least three potential focus areas or specific should cost initiatives you will research for possible implementation.
RESOURCES

DAU CLB040
O&S Cost Management Guidebook
Should Cost Portal (P²L²)
BBP Portal
IPS Element Guidebook
Product Support Manager Guidebook
Program Manager Toolkit
Performance Based Logistics Guidebook

Articles:
Sustainment and Logistics in Better Buying Power
Applications of Should Cost to Achieve Cost Reductions
Marty Sherman
619-524-4807
marty.sherman@dau.mil
## Focus Area Description

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Achieve Affordable Programs</strong></td>
<td>Conducting a program at a cost constrained by the maximum resources the Department can allocate for a capability. These resources include funding, schedule and manpower.</td>
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<tr>
<td><strong>Control Costs Throughout the Product Lifecycle</strong></td>
<td>The ability to understand and control future costs from a program’s inception is critical to achieving affordability requirements.</td>
</tr>
<tr>
<td><strong>Incentivize Productivity and Innovation in Industry and Government</strong></td>
<td>Reward contractors for successful supply chain and indirect expense management.</td>
</tr>
<tr>
<td><strong>Eliminate Unproductive Processes and Bureaucracy</strong></td>
<td>Unnecessary and low-value added processes and document requirements are a significant drag on acquisition productivity and must be aggressively identified and eliminated.</td>
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## Focus Area Description

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Promote Effective Competition</strong></td>
<td>Real competition is the single most powerful tool available to the Department to drive productivity.</td>
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<tr>
<td><strong>Improve Tradecraft in Acquisition of Services</strong></td>
<td>The substantial amount of money spent on contract support services demands a management structure to strategically source these goods and services.</td>
</tr>
<tr>
<td><strong>Improve the Professionalism of the Total Acquisition Workforce</strong></td>
<td>It is the duty of the acquisition workforce to conduct itself with excellence, responsibility, integrity and accountability.</td>
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</table>