“Reaching New Dimensions in Performance Management”
Earned Value Management (EVM)
October 28, 1996

Sam Araki
Retired President
Lockheed Martin Missiles & Space
# Reaching New Dimensions in Performance Management

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**Performing Organization:** Lockheed Martin Missiles and Space

**Sponsoring/Monitoring Agency:** OUSD(A&T)

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**Abstract:** See Report.

**Subject Terms:**

<table>
<thead>
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<th>Security Classification</th>
<th>Limitation of Abstract</th>
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<tbody>
<tr>
<td>Unclassified</td>
<td>Public Release</td>
<td>39</td>
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**Name of Responsible Person:**

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“The use of earned value management process . . . even where no contractual requirement exists. I intend to expand this practice and to make earned value the basis for management of all our efforts.”

“Our programs must continue to improve their performance management practices and skills and we must intensify efforts to eliminate activities that do not add value to the program management process.”

Sam Araki
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August, 1995 Sam Araki formed the EVM Task Force with the following objective:

Extend to all enterprise activities a **cost effective**, earned value system that satisfies **minimal requirements** consistent with prudent business practice and essential to both the **intent of C/SCSC** and best **commercial practice**
Unprecedented Support

“Task Force activities will not prejudice recognition by the Department of Defense of the Lockheed Martin Sunnyvale Performance management System as compliant with Cost/Schedule Control Systems Criteria (C/SCSC).”

“The commendable initiative shown by Lockheed Martin, Sunnyvale and by DPRO is consistent with the objectives of Acquisition Reform, and provides an opportunity to minimize or eliminate differences between military and commercial management requirements.”

Dr. P. G. Kaminski, Under Secretary of Defense, (Acquisition and Technology)
EVM Task Force

Steering Committee
LMMS Office of the President
DCMC Commander

Exec. Task Force
Key Program Vice Presidents
Division Directors of Business Ops
DCMC Deputy Commander

Implementation Team
Task Force Manager
DCMC C/SCSC Focal Point
Program Reps
Process Reps
Information Systems Reps
Functional Reps

- LMMS and DCMC Exec. Mgmt

- Business, DCMC, and Program Senior Mgmt

- Cross Functional Team
DCMC’s Expectations

- Government and company program manager ownership of EVM
- Standardization of EVM process across the enterprise
- Cost effective and meaningful joint surveillance
- Eliminate non-value-added activities associated with EVM
Perform a Requirement Analysis

Top Down

- Sound principles
- Some clarification and redundancy
- White Paper

Rewrite I/P
- Expected outcome good

Rewrite for all programs
- Integrate with other systems - WEB

Get the message out, retrain!!!

Identify and remove impediments

- Professional interpreters developed
- Lack of real “user” involvement
- Mistakes generated rules
Pilot Program

Benchmark - IRIDIUM®

Pilot - Milstar

Best-Demonstrated Practices

Program Implementations

Process Change Flow
EVM Change Status

Process Change Candidates

- EAC Triggers
- Variance Analysis
- Work Authorization
- Baseline Management
- Consistent OBS/WBS
- Level of CAM
- Business Support Role
- EV Technique
- Streamlined Material EV
- Use of Metrics
- Meetings/Information
- COTS
- Surveillance
- EDI

Process changes resulted from commercial benchmarking and best demonstrated practices
Eliminate Non-Value-Added Activity

Coopers & Lybrand Study
- C/SCSC 3rd-highest regulatory cost driver
- Two-thirds effort associated with pushing paper

Annual estimated unique pieces of paper generated before and after process change for single program

Variance Analysis
Work Auth
Annual EAC

Paper Generated Pre-EVM Chg
Paper Generated Post-EVM Chg
Use the “Real Info”

**LMMS Action**

- Eliminate cost account variance reports
- Develop standard status review charts for teams with graphics
- Encourage customer participation on IPTs

**IPT Status Meeting**

```
CV (100)  SV  75
SPI  1.02  CPI  .95
```

**Total Float +15**

“I’ve got to get these variance analysis reports written”

“Beans R Us”

**Capitalize on internal program management process**
The Value of Judgment

Substitute Analysis For Arbitrary Rules

“All Traffic Must Stop”

OR

“Yield”

Focus on the Message

Driver’s Intent

LMMS Actions

- EAC triggers
  - SPI
  - CPI
  - TCPI
  - Risk

- Replace thresholds with significant indicators
  - Risk Areas
  - PDT Concerns
  - WBS

- Use analysis realtime
Develop a Quality Assurance Program

“Contractor Ownership Includes Methods to Evaluate and Ensure the Quality of the EVM System”

Monitor

- **Product**
  - Data reviewed by senior management
  - CPR data analysis
  - Independent EAC analysis
  - Program reviews

- **Process**
  - Statistical process control approach
  - Use diagnostics and metrics
  - Program take responsibility for generation and response

Key Features
- Non-interface
- Look for trends and significant discrepancies
- Replace CAM Interviews with “training” where indicators exist
- Focus includes value of information provided
Teamed for the Future

Must Break Down Stovepipes for Common Processes

- Adopted Throughout LMMS
- Corporate Handbook
- Working w/ Gov’t & Industry
- DCMC Key

Integrated Product Teams

Single Processes

Engr  Mfg  Test  ILS  Vendors

Air Force  Army  Navy  NASA  Commercial
Combine Surveillance Needs

Teaming Approach to Ongoing Surveillance

Customer’s Customer
Service Focal Pt.
DCMC Hdqtrs
DCMC District
DCMC Local
Program A
Internal Compliance
Customer PO
CORLAC
DCAA

Joint Surveillance Team
Customer PO
DCAA
DCMC Local
Internal Compliance
Program A
Benefits to the Government

- Public funds are at risk on large cost based contracts – a joint Program Office, DCMC, & LMMS process will exist to manage resources wisely
- Atmosphere created that capitalizes strengths of participants in surveillance process to develop programs with opportunity of success
- Environment fosters active and constructive participation of DCMC, DCAA, and Program Offices with LMMS to develop a sound earned value management strategy

Potentially adversarial relationships transformed into productive partnership – renewed emphasis placed on importance of cross-functional teaming
Contractor Benefits

- The integration of system surveillance, data surveillance and program surveillance
- Focus on quality and utility of reports
- Tailor processes to the way the contractor naturally manages
- Focus on prevention of management system deficiencies rather than “find and fix”
- Conduct government reviews only when surveillance and reporting indicate system integration and discipline deficiencies are distorting the presentation of program status
Joint Benefits

• Early teaming yielded end-game success
• Developed mutual respect for government/contractor perspectives
• Both parties feel positive about eliminating non-value added activity
• Mutually able to attack real issues – avoided "Committee Fluff"

Gain of Company ownership is a win-win for government and contractor
Downsizing – A Reality of the New Environment

(Constant FY 1994 Dollars)

Source: DoD budget
Note: DoD is a nonprophet organization
Acquisition Reform Leads the Way to the Use of Commercial Practice and Products for Defense

**Commercial Processes**
- Earned Value Management
- ISO 9000
- Commercial Specs
- Electronic data Management
- Outsourcing Initiative

**Commercial Components**
- Standard Products
- A2100 → A2100M

**Common Processes**
- Mil Spec Replacement
- Contract Requirements Commonality

**DoD Acquisition Reform**

**Competitive LMMS**
Other Key Dates
C/S DoD Policy - 1996
Move to Acquisition - 1989

1994
- J
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- M
- J
- J
- A
- S
- O
- N
- D

1995
- J
- A
- S
- O
- N
- D
- J
- F
- M
- A
- M
- J

- Jan
- EVM implementation Team formed
- Araki declaration
- Kaminski endorsement
- Customer kickoff
- Commercial benchmark complete
- Pilot complete
- Customer feedback

1996
- J
- A
- S
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- N
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- J
- F
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- A
- M
- J
- J
- A
- S
- O
- N
- D

- NOW
- Customer feedback
- System buy-off complete
- LMMS EVM Initiative

Industry Standard Development
- NSIA takes up challenges to develop industry standard
- Industry standard released for comment
- Industry & JIC team meet

DoD Changes
- Acquisition reform IBR policy
- Gov’t offer to industry to develop industry standard
- Kaminski announces Cooper & Lybrand study results
- Longmaure letter to SAEs
- PMJEG abolished responsibility transferred to DCMC
- 5000 TR issued
- Draft of JIG version H released
- Draft of JIG version H updated

Draft of JIG version H released
EVM Initiative

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Commitment

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September 1995
Pilot Program

Benchmark – IRIDIUM®

Pilot – Milstar

Best-Demonstrated Practices

Program Implementations

Process Change Flow
“The IRIDIUM® Challenge”

- Imposed a challenge to program team to create a paradigm shift to achieve shorter cycle time, reduced cost, and higher quality never achieved in the space business.
- Empowered program team to take the best program management practices and eliminate all non-value-added policy, procedures, and work.
- Applied special program “Skunkwork” approach (IPT) and Six Sigma quality.
- Provided the best motivated people, facility equipment and tools to get the job done.
- IRIDIUM® program manager chose to strip down the C/SCSC Earned Value Management tool to manage cost schedule performance and achieved excellent program management results.
- Earned Value Management system developed on IRIDIUM® became the best commercial practice benchmark.
What are the Minimum Requirements?

Premise:

- If commercial business had no requirements, and
- If management believes they are successfully managing those programs, and
- If we are motivated to be cost effective,
- Then commercial business practices are the minimum requirements

Would commercial business practices satisfy our government customers?
Pilot Program Approach

- Use Milstar program as a pilot
- Use IRIDIUM® program as a commercial benchmark
- Apply benchmark program practices and concepts to pilot
- Analyze results and cost effectiveness

Objective: To demonstrate a government program can be satisfied with current LMMS commercial business practices
Identify and remove impediments

- Professional interpreters developed
- Lack of real “user” involvement
- Mistakes generated rules

Top Down

Criteria

“Guidance”

Company

Folklore

Sound principles
Some clarification and redundancy
White Paper
Rewrite internal procedures
Expected outcome good
Rewrite for all programs
integrate with other systems – WEB
Get the message out, retrain!!!

Performed a Requirements Analysis
Culture Change

“The Biggest Challenge of All”

Rigid Control + Slow Reaction

Flexible Control + Quick Reaction

Refocus

Training is Key

Concept

SAR vs IBR

OUSD
Co. Surv.
DCAA
DCMC
Customer

“Oversight” Program Manager

Co. Surv.
Customer

DCMC

“Insight” Program Manager
Combine Surveillance Needs

Program A

CORP

DCMC Hdqtrs

DCMC District

DCMC Local

Customer's Customer

Service Focal Point

Customer PO

Internal Compliance

Program A

DCAA

Teaming Approach to Ongoing Surveillance

Joint Surveillance Team

Customer PO

DCMC Local

Internal Compliance

Program A
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- Use analysis realtime
**Teamed For The Future**

**Must Break Down Stovepipes for Common Processes**

- Integrated Product Teams
  - Adopted throughout LMMS with customers
  - Corporate handbook

- Single Processes
  - Working with Government and Industry
  - DCMC Key

- Engr
- Mfg
- Test
- ILS
- Air Force
- Army
- Navy
- NASA

Vendors

Commercial
Established Common Core Process

Tailor for Fit by Providing a Common Toolbox

- Phase out 3 of 4 major mainframe systems
- Adding 1 PC-based EVM tool
- Down selecting multiple schedule packages
- Adding key interfaces
- Focus on COT solutions

Use The Right Tool For The Job

One Size Does Not Fit All

Ask yourself WHY are your processes too “unique” to use COTS
Developed a Quality Assurance Program

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Capitalize on internal program management process

“Beans R Us”
• Acquisition reform has been an enabler

• Lockheed Martin Missiles and Space
  – Customer/product diversity
  – Consolidation managed as a program (EVM)

• EVM summary
  – Enterprise commitment
  – Get back-to-basics
  – Company and program ownership
  – Insight vs oversight
  – Minimum requirements
  – Metric quality assurance program
One-Year Enlightenment

- Precepts of EV are sound
  - Implementation was off-track
- Program definition and planning is key ingredient
- User friendly mechanism
  - Ultimate user involvement
  - COTS/people/process
- Institutionalize/standardize
  - EVM
    - DoD
    - Civil
    - Commercial
    - Internal jobs
- IPT’s involvement
  - Realtime progress focus
  - Management focus not reporting
  - Insight vs oversight