



***“Reaching New Dimensions
in
Performance Management”***

***Earned Value Management (EVM)
October 28, 1996***

***Sam Araki
Retired President
Lockheed Martin Missiles & Space***

REPORT DOCUMENTATION PAGE

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Lockheed Executive Commitment



“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.”

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Lockheed Martin Missiles & Space



EVM Initiative

LMMS



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



OSD Commitment



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



- **LMMS and DCMC
Exec. Mgmt**

Steering Committee

**LMMS Office of the President
DCMC Commander**

- **Business, DCMC,
and Program
Senior Mgmt**

Exec. Task Force

**Key Program Vice Presidents
Division Directors of Business Ops
DCMC Deputy Commander**

- **Cross Functional
Team**

Implementation Team

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



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

LMMS



Top Down



Sound principles
Some clarification and redundancy
White Paper

Criteria

Rewrite I/P
Expected outcome good

"Guidance"

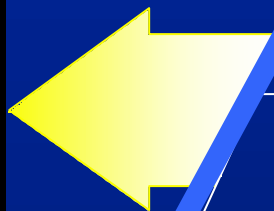
Rewrite for all programs
Integrate with other systems - WEB

Company

Get the message out,
retrain!!!

Folklore

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



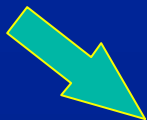
Identify and remove impediments



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

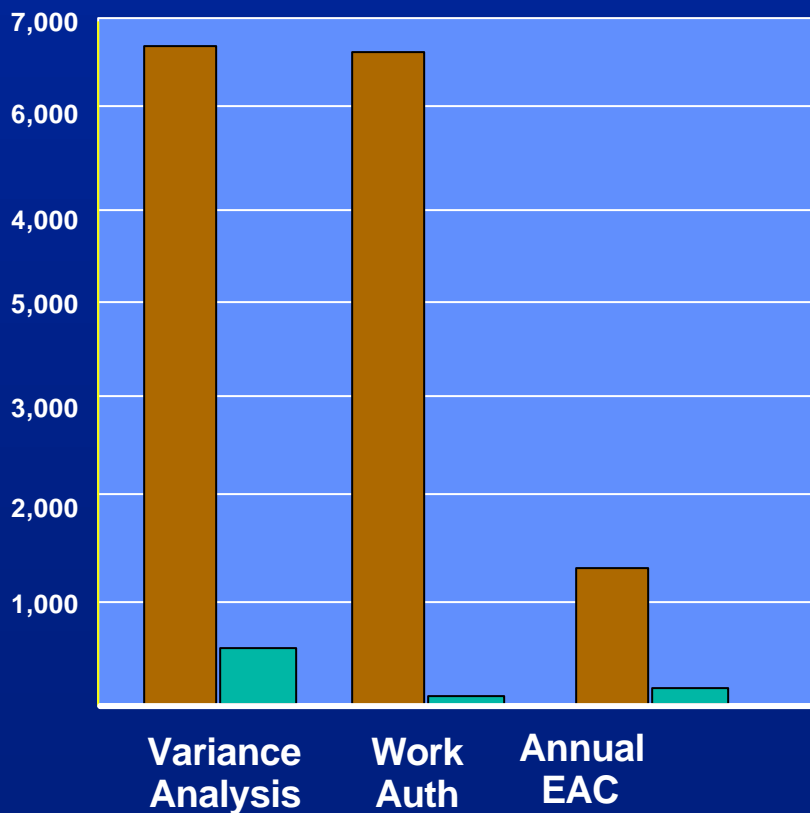


Eliminate Non-Value-Added Activity

LMMS



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



Coopers & Lybrand Study

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

Paper Generated Pre-EVM Chg
Paper Generated Post-EVM Chg



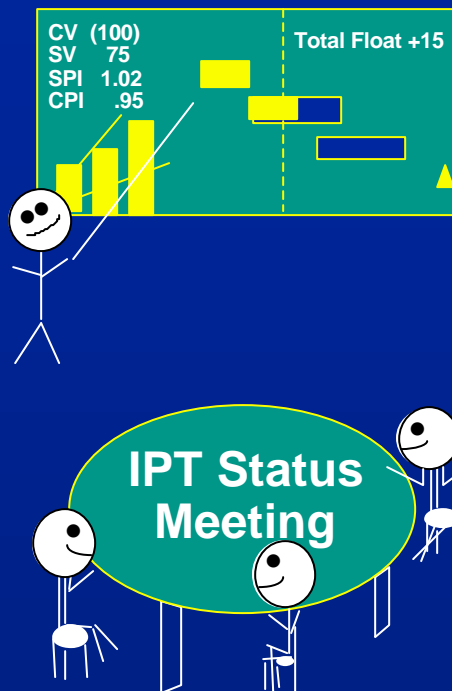
Use the "Real Info"

LMMS



LMMS Action

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



I've got to get these variance analysis reports written



Capitalize on internal program management process



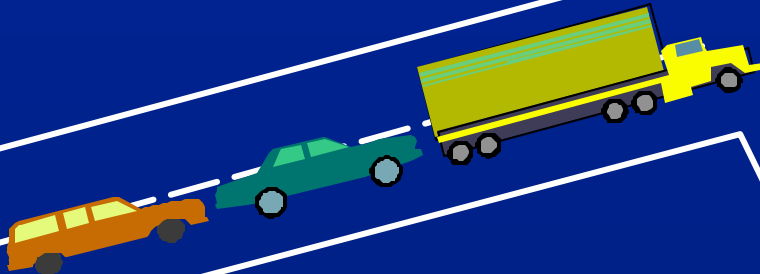
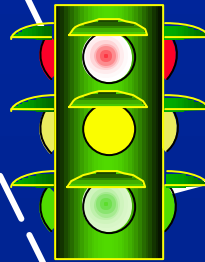
The Value of Judgment

LMMS



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

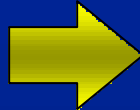
LMMS



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

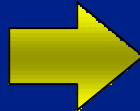
Monitor

• 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

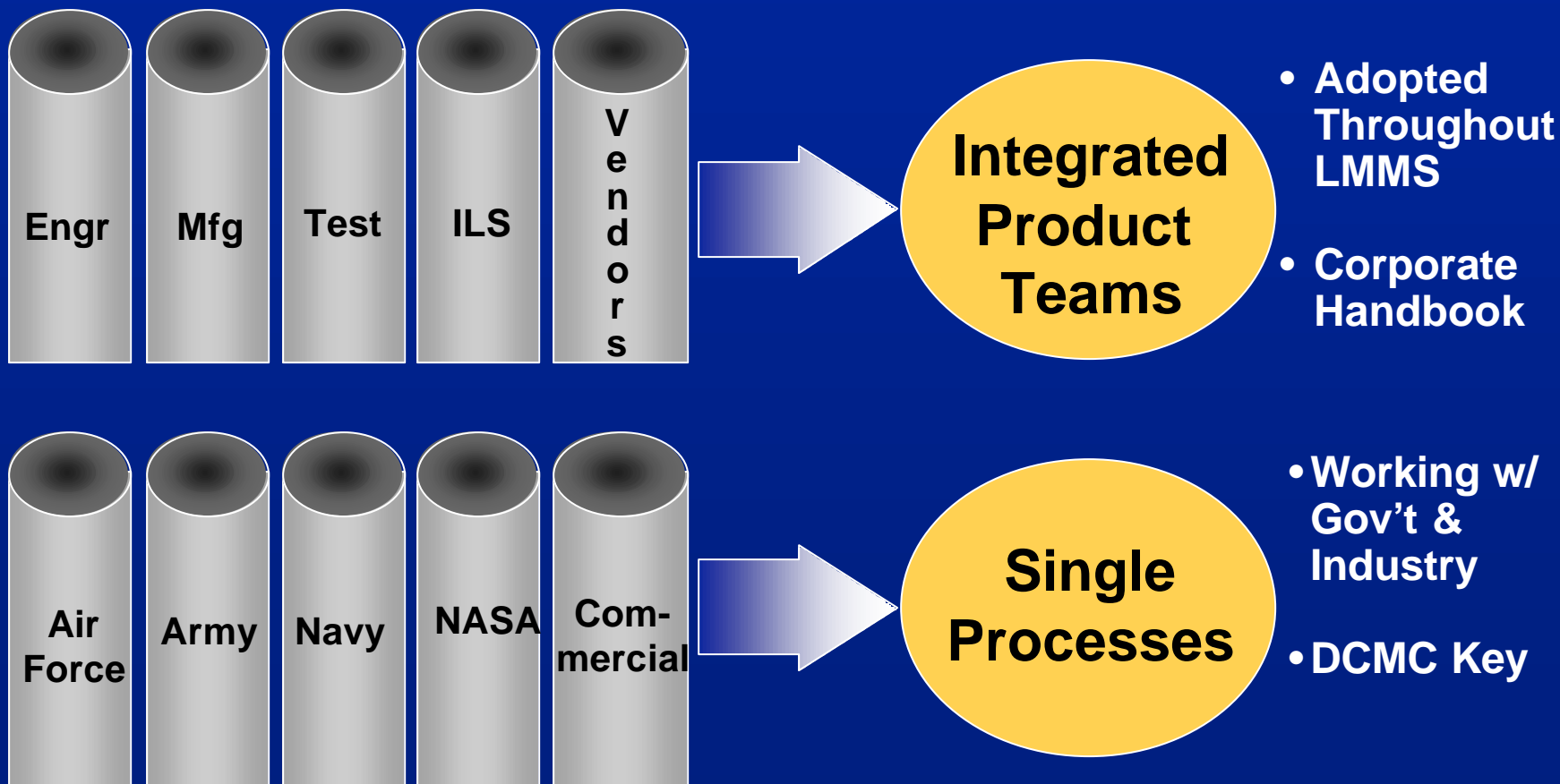
- Non-interface
- Look for trends and significant discrepancies
- Replace CAM Interviews with “training” where indicators exist
- Focus includes value of information provided



Teamed for the Future



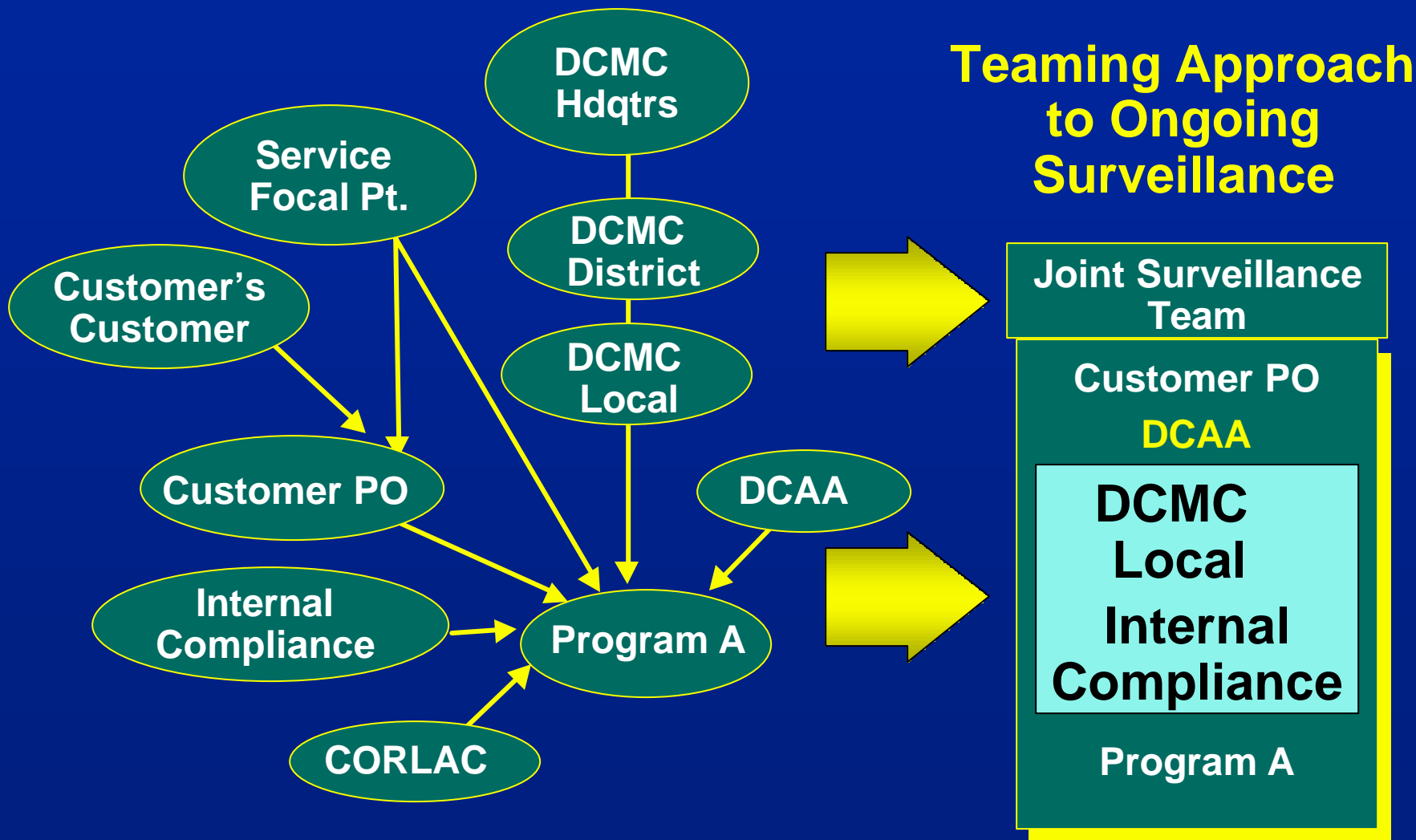
Must Break Down Stovepipes for Common Processes





Combine Surveillance Needs

LMMS





Benefits to the Government

LMMS



- **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

LMMS



- 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



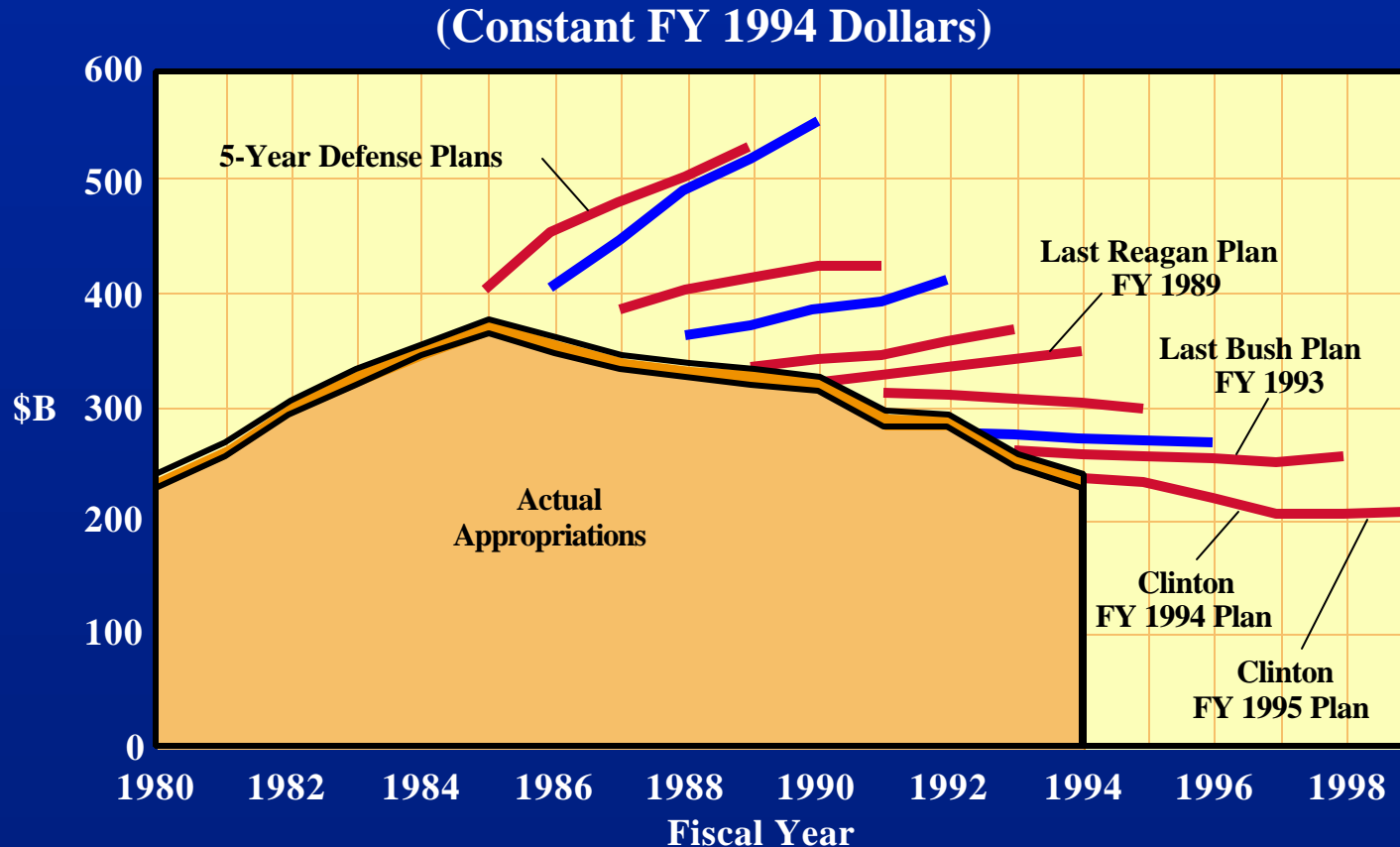
Joint Benefits



- **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

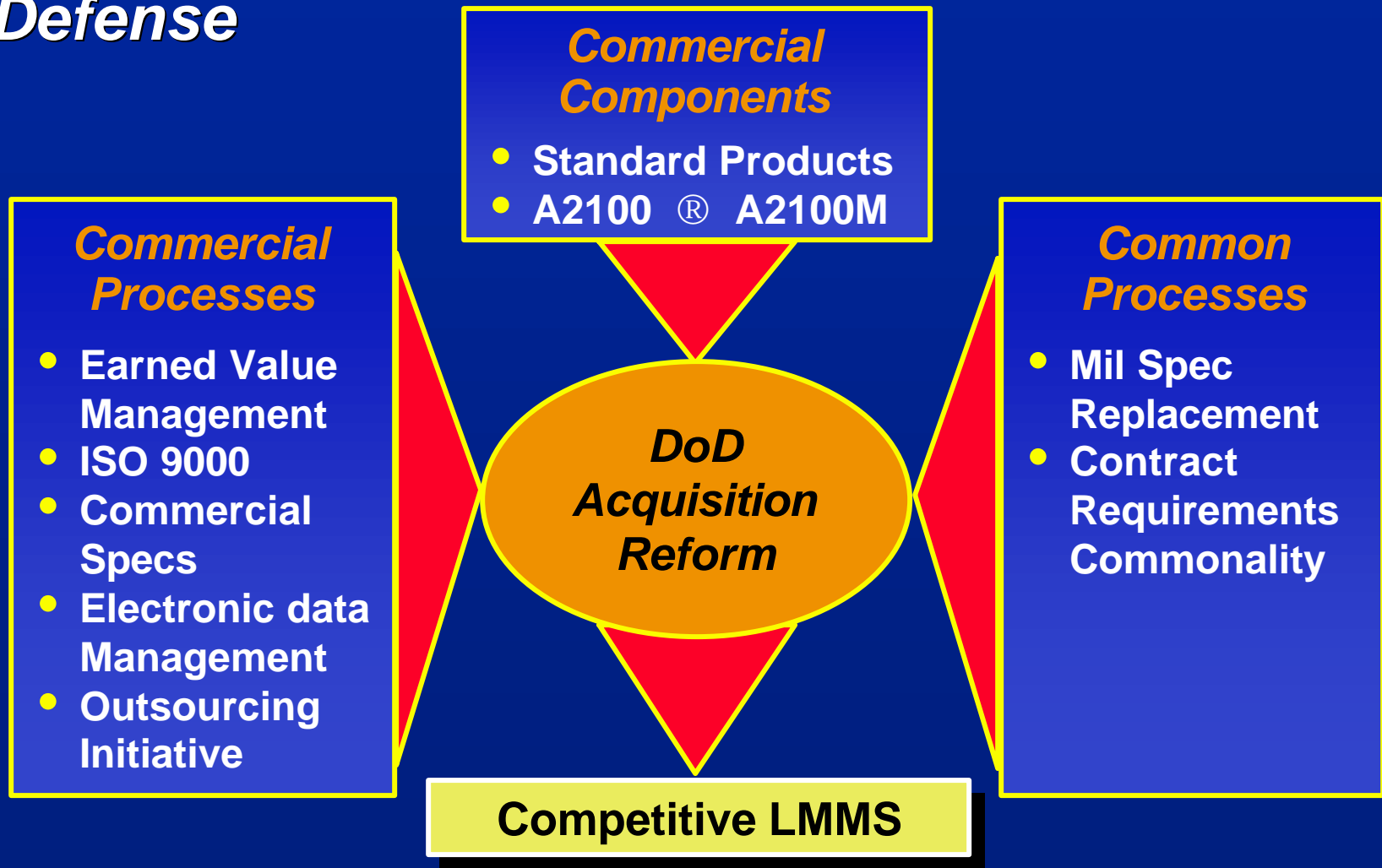
Downsizing – A Reality of the New Environment



Source: DoD budget

Note: DoD is a nonprophet organization

Acquisition Reform Leads the Way to the Use of Commercial Practice and Products for Defense



Earned Value Time

Other Key Dates

C/S DoD Policy - 1996

Move to Acquisition - 1989

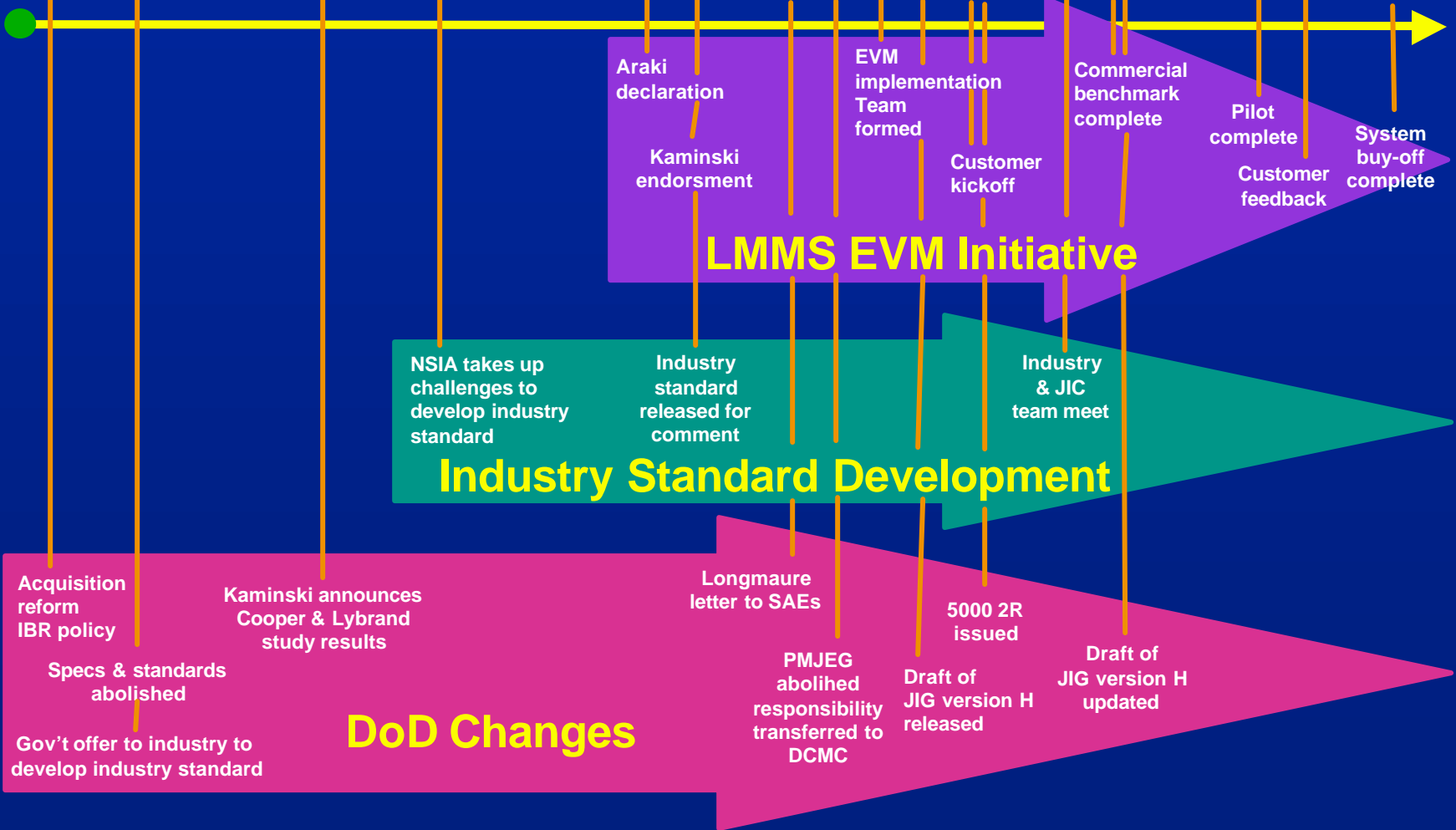
1994

1995

1996

NOW
↓

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



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September 1995***

Pilot Program

1991



Benchmark – IRIDIUM®



1993



Pilot – Milstar

Best-Demonstrated Practices



1995



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**

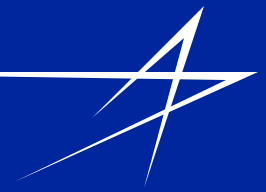
Objective: To demonstrate a government program can be satisfied with current LMMS commercial business practices

Performed a Requirements Analysis



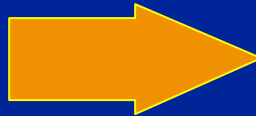
Identify and remove impediments

Culture Change



“The Biggest Challenge of All”

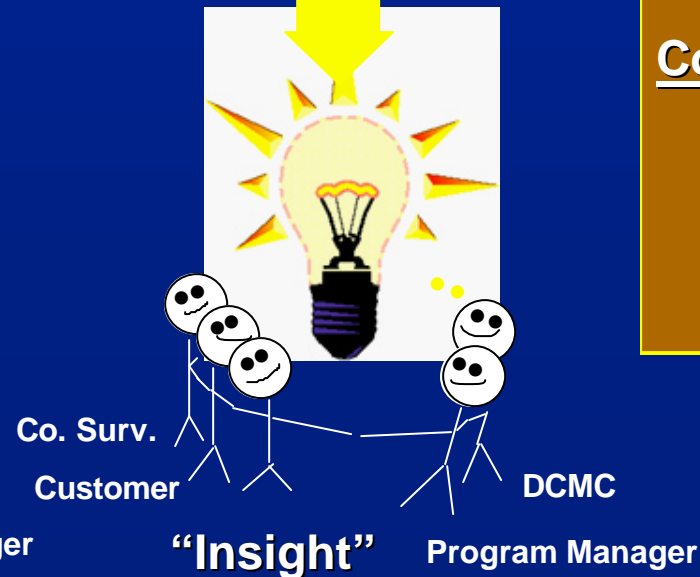
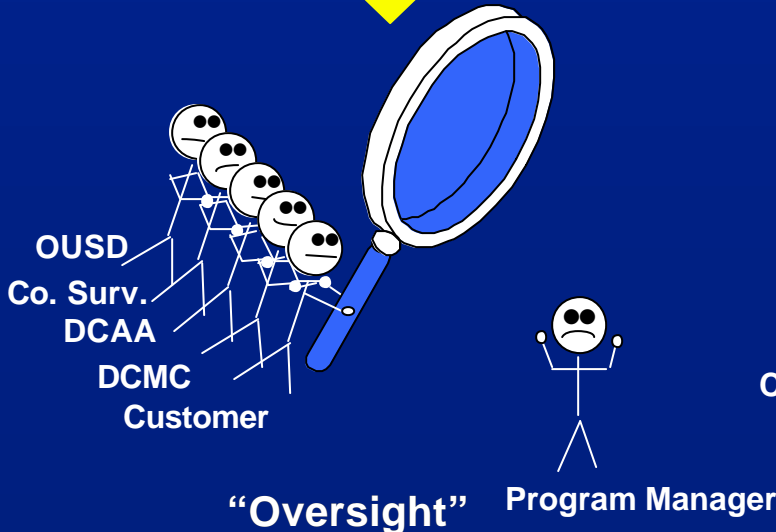
Refocus



Training is Key

**Rigid Control
+
Slow Reaction**

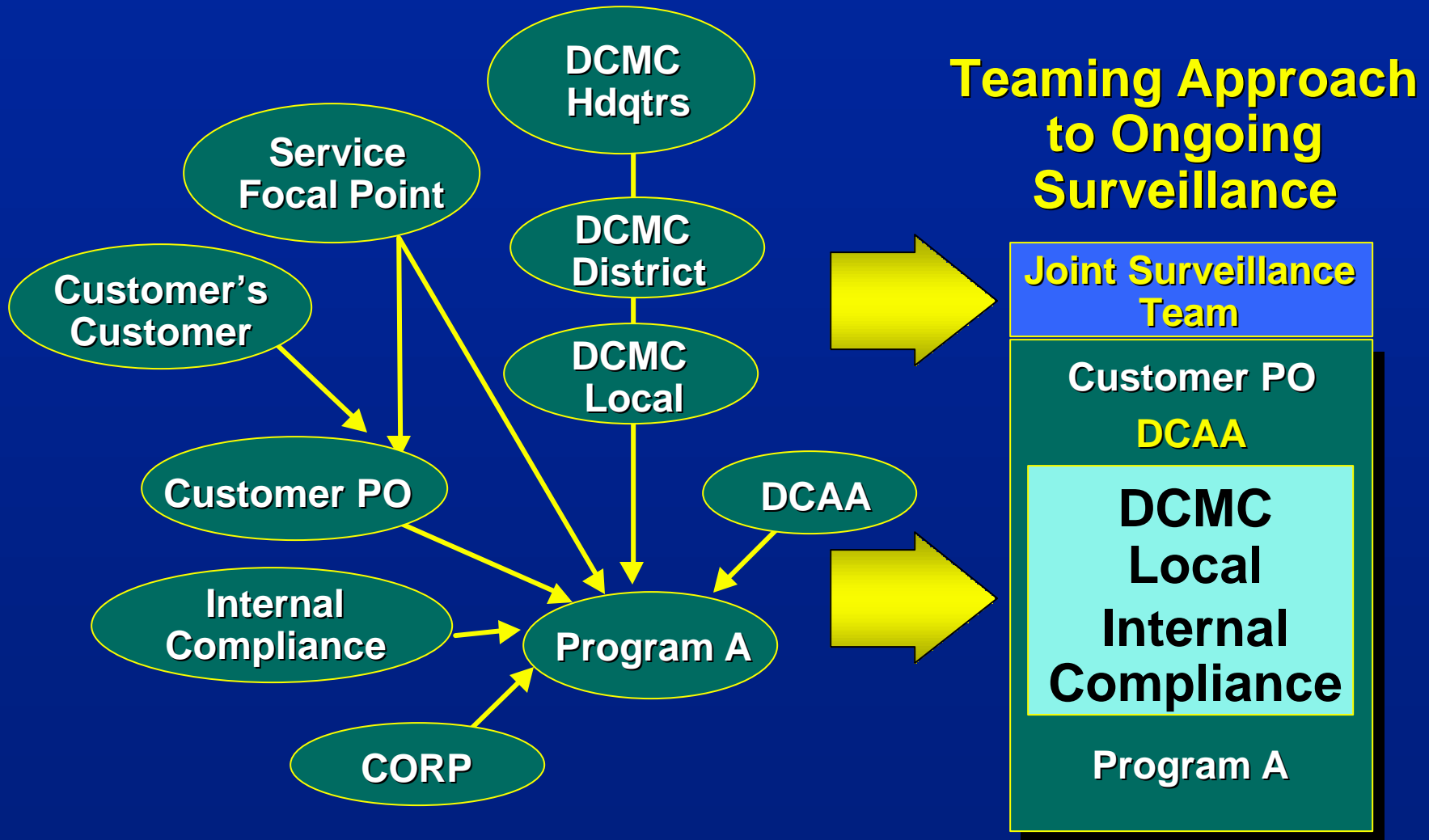
**Flexible Control
+
Quick Reaction**



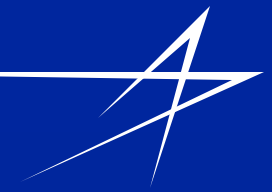
Concept

SAR
VS
IBR

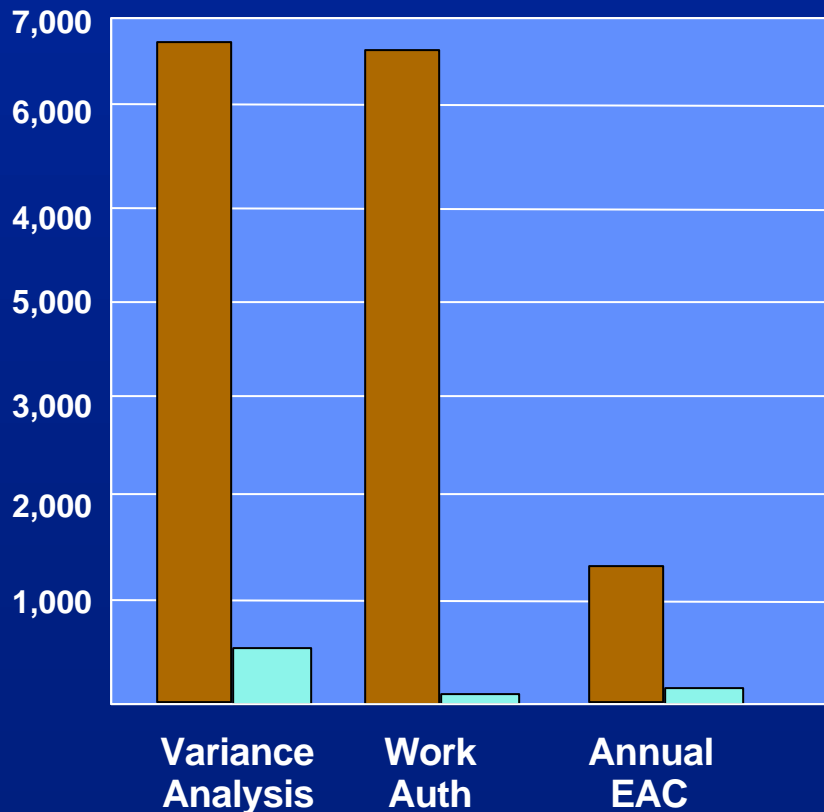
Combine Surveillance Needs



Eliminate Non-Value Added Activity

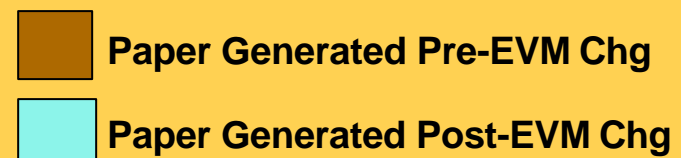


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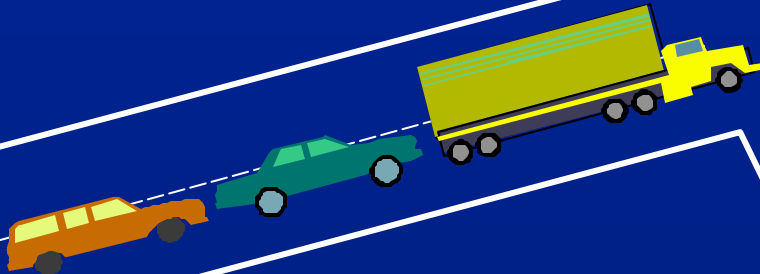
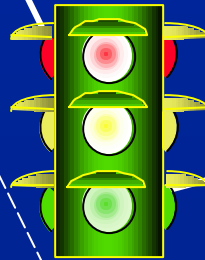




The Value of Judgment

Substitute Analysis For Arbitrary Rules

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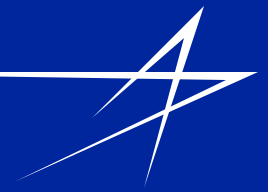
Focus on the Message
Driver’s
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LMMS Actions

- ➔ EAC triggers
 - SPI
 - CPI
 - TCPI
 - Risk

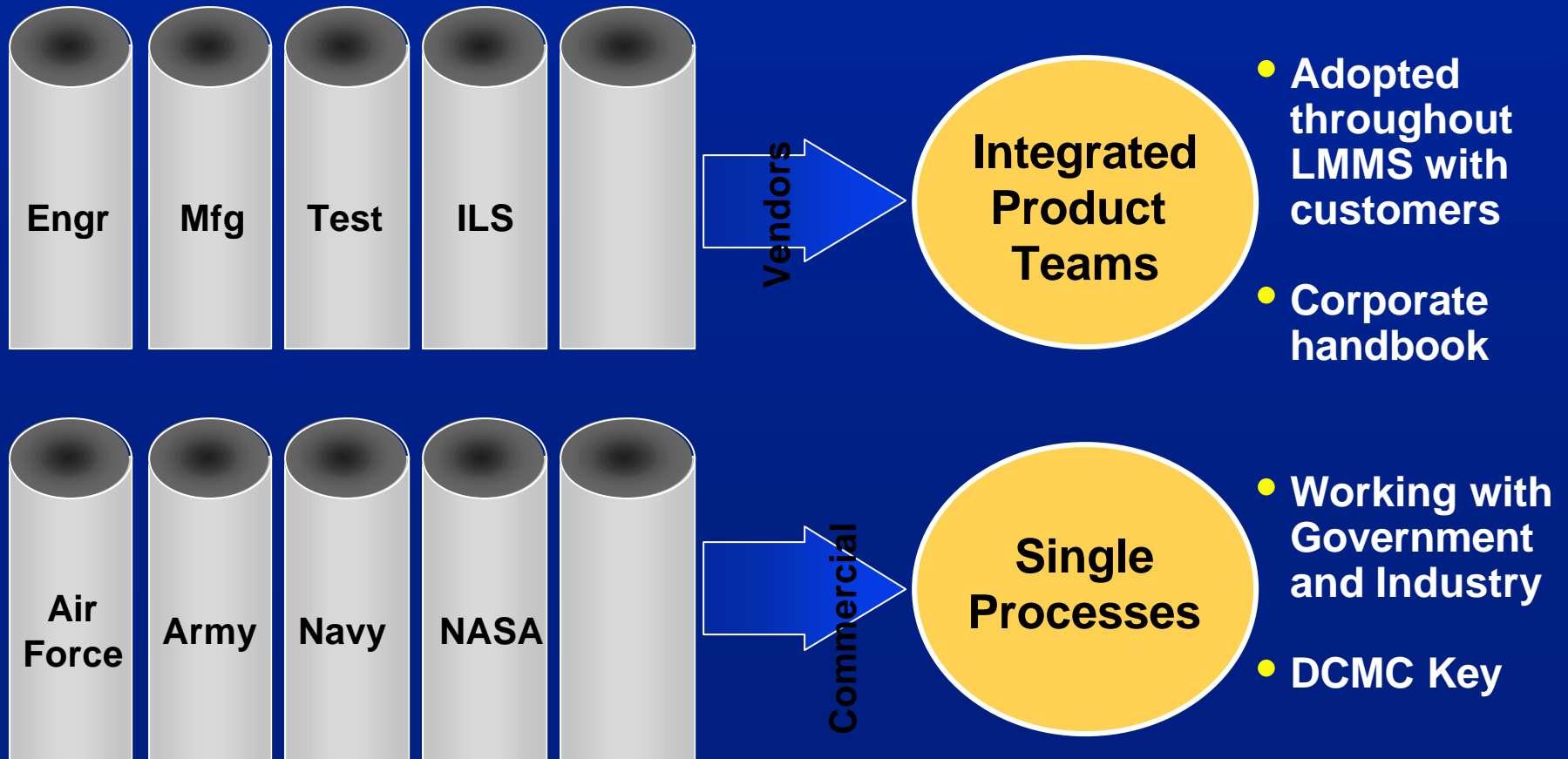
- ➔ Replace thresholds with significant indicators
 - Risk Areas
 - PDT Concerns
 - WBS

- ➔ Use analysis realtime



Teamed For The Future

Must Break Down Stovepipes for Common Processes

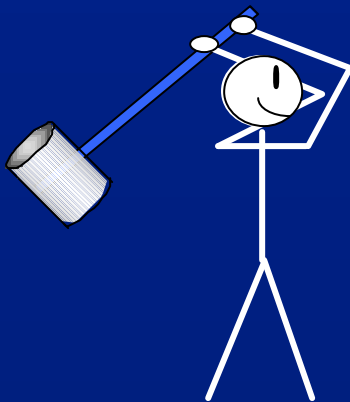


Established Common Core Process

Tailor for Fit by Providing a Common Toolbox

**Use The
Right
Tool For
The Job**

**One Size
Does Not
Fit All**



- ➔ 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

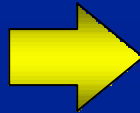
Ask yourself WHY are your processes too "unique" to use COTS

Developed a Quality Assurance Program

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

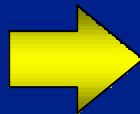
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- **Product**



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- **Process**



- Statistical process control approach
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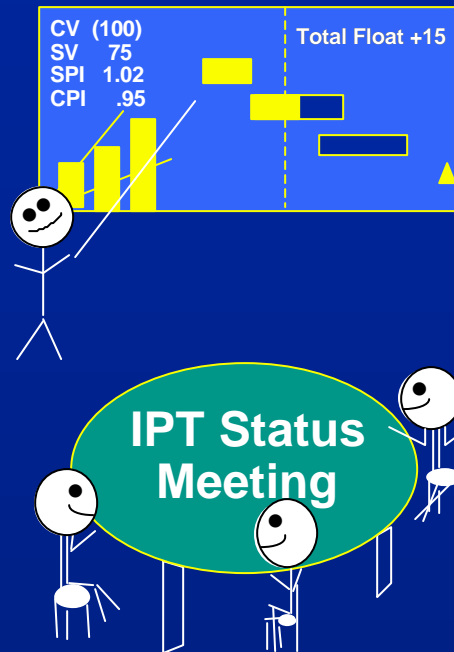
Key Features

- Non-intervention
- Look for trends and significant discrepancies
- Replace CAM interviews with “training” where indicators exist
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Use The "Real Info"

LMMS Action

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- Develop standard status review charts for teams with graphics
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I've got to get these variance analysis reports written



Capitalize on internal program management process



- **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**