



GSAW2005

Ground System Architectures Workshop

Welcome to GSAW2005

Collaboration and Common Solutions

Challenges and Opportunities in Transforming
National Security Ground Systems

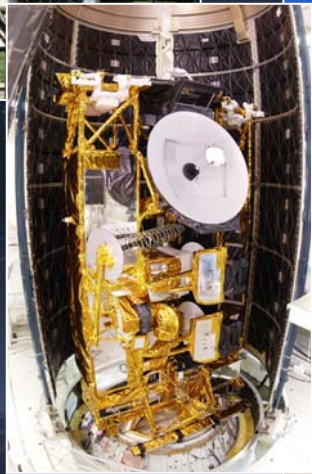
Dr. William F. Ballhaus, Jr.

President and CEO,
The Aerospace Corporation

GSAW2005

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Mission - Enabled by Ground Systems



Photographs courtesy of U.S. Air Force.

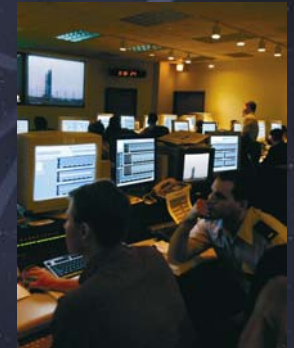
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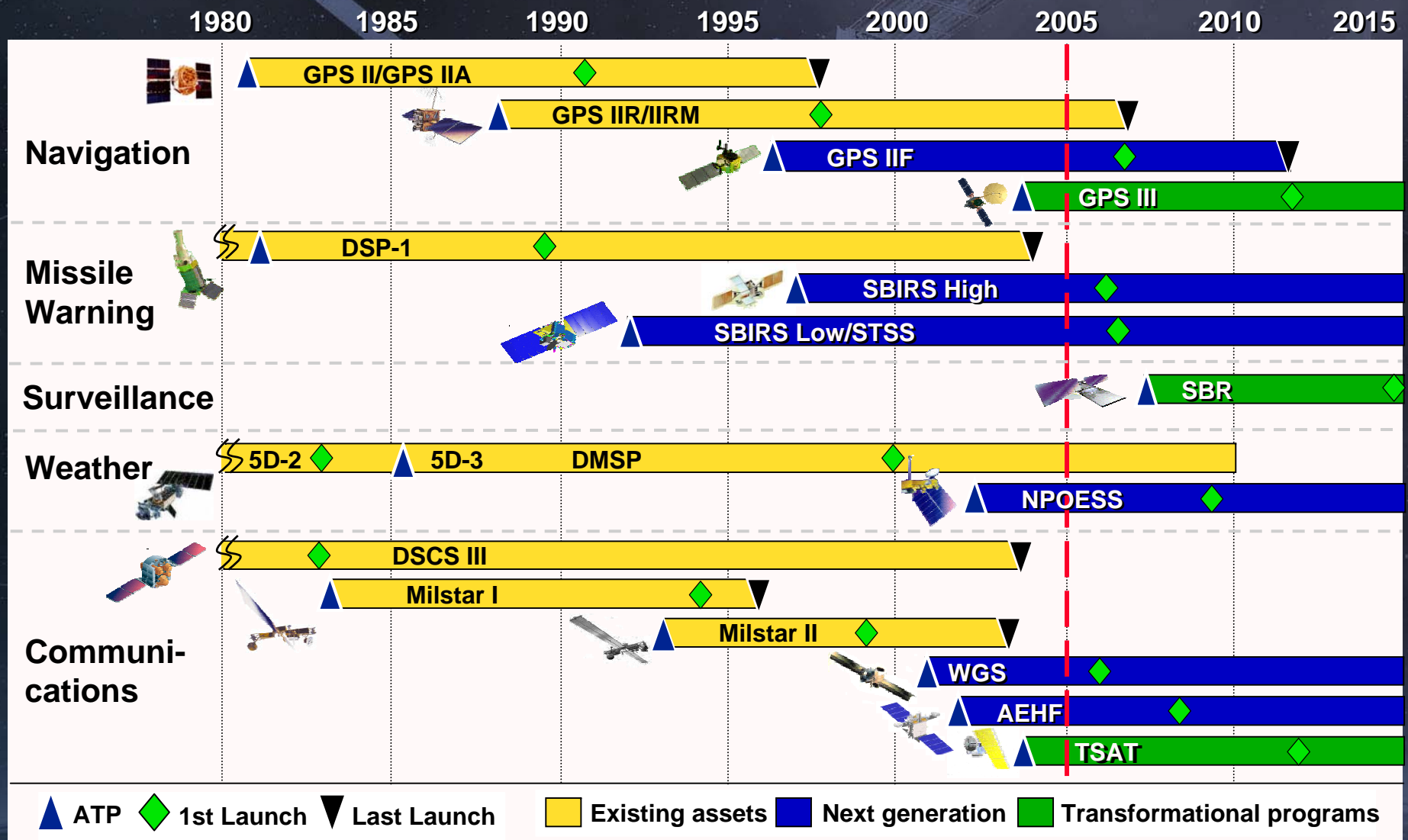
The Challenges and Opportunities of Transforming National Security Ground Systems

- 1) Overcome acquisition lapses of the 1990s
- 2) Transition to network-centric operations — enabled by ground and space

GSAW has made and can continue to make significant contributions in meeting our challenges and opportunities



Every Mission Area is Being Re-capitalized

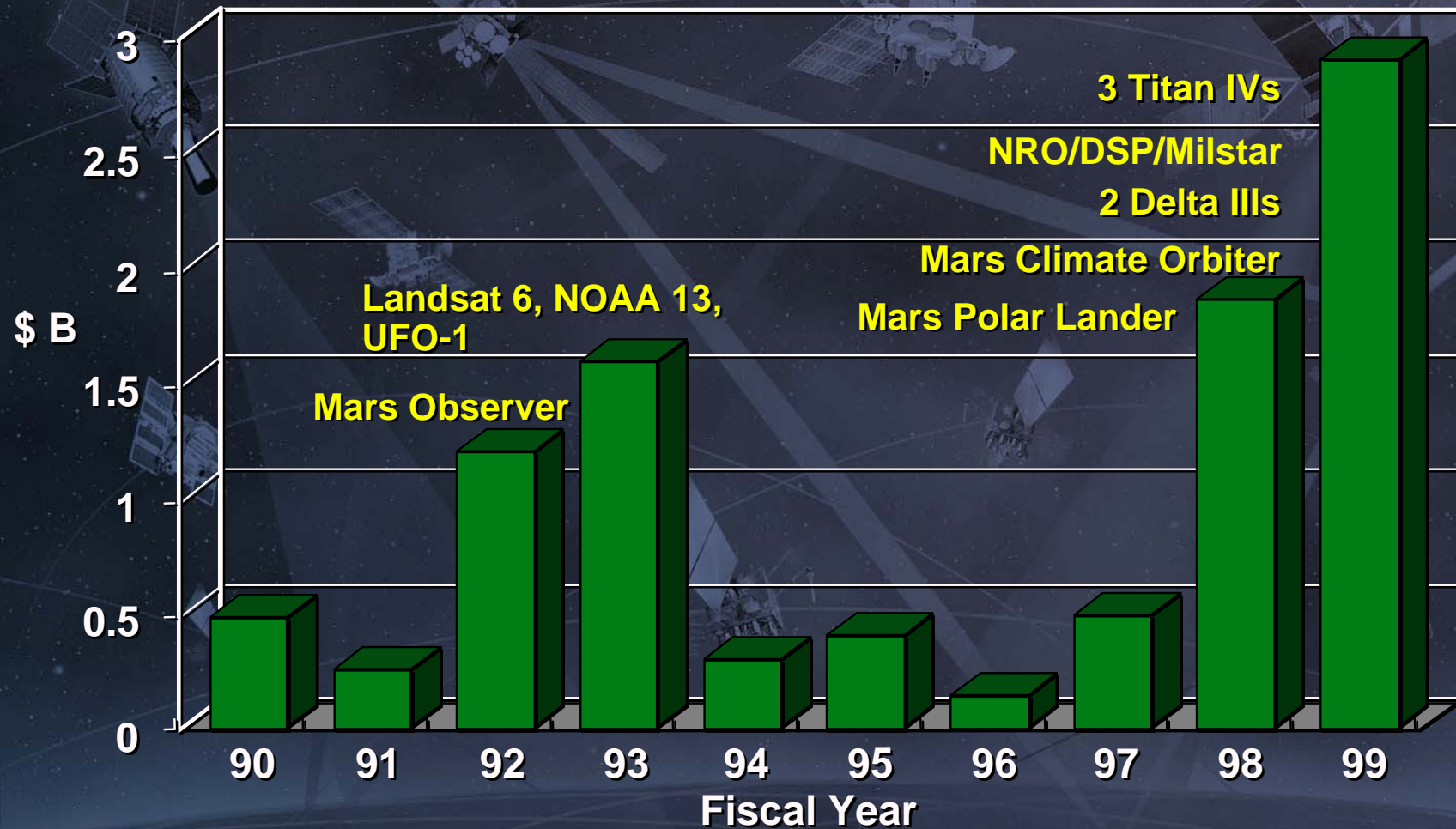


Note: Only Air Force programs displayed

Graph courtesy of U.S. Air Force.

Over \$11 Billion in Lost Space Assets in 1990s

Military, Civil + Commercial Satellite/Launch Failures



Graph courtesy of W. Tosney; Proceedings of the 4th International Symposium on Environmental Testing for Space Programmes, June 2001.

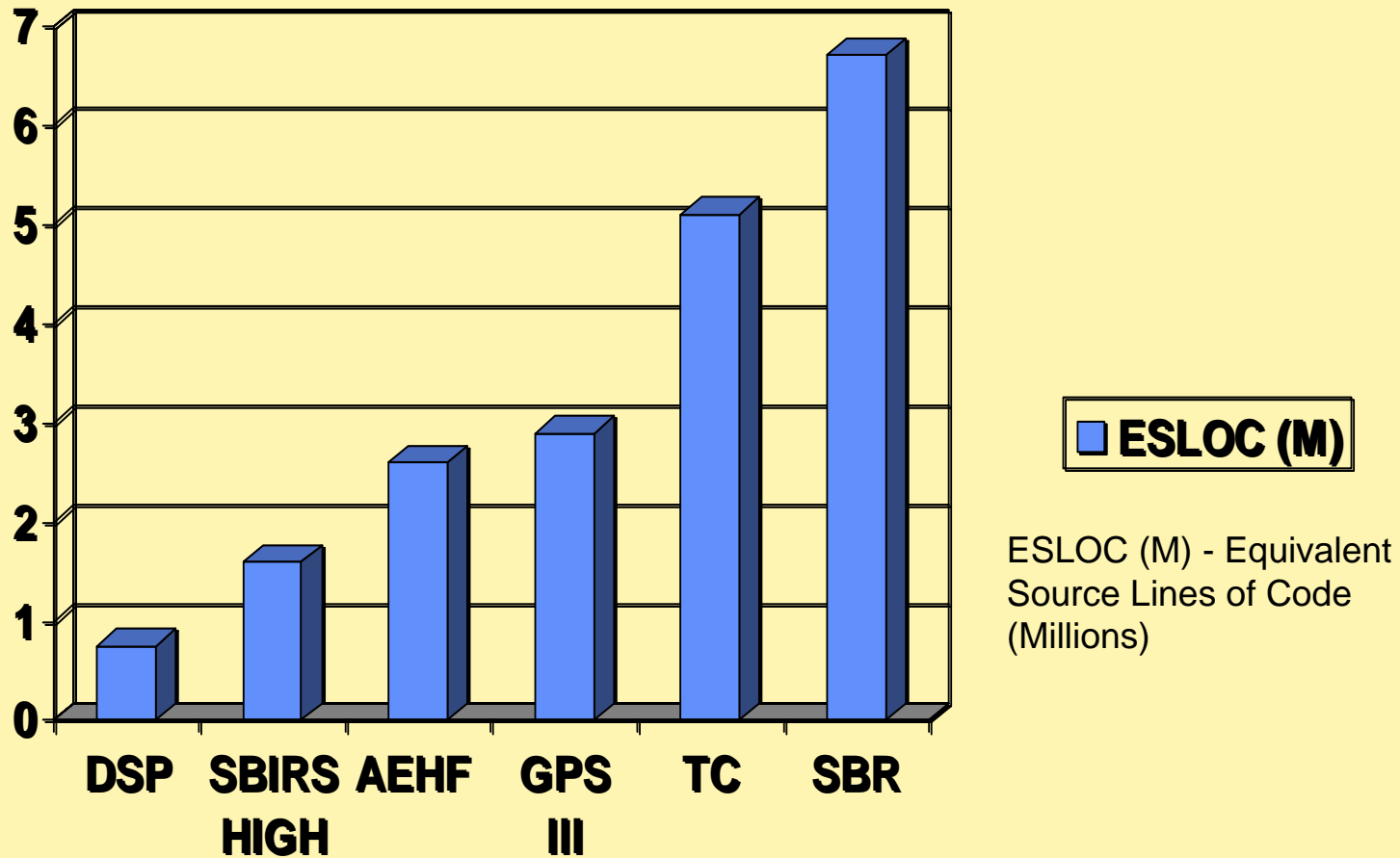
1990s: What Really Happened

- Cost more important than mission success
- Proven management and systems engineering practices abandoned for unvalidated engineering and acquisition practices
- Government gave up oversight; industry didn't pick it up
 - Systems engineering, quality assurance, supply chain management
- Collapse of commercial space business



Mission Success Not Emphasized

Growth in Software Criticality, Size and Complexity



Mission Success Tenets

- Establish Mission Success as Job #1
- Assure the design, verification, and test requirements are right
 - Conduct independent assessments
 - Test like you fly
- Rigorously manage the baseline implementation
 - Core specs and standards on contract
 - Disciplined parts, materials, and process control
 - Program metrics that provide early warning of problems



Technical Rigor and Disciplined Process

Mission Success Tenets (Cont'd)

- Organize and plan for mission assurance and reliability
 - Clear flow of accountability and responsibility
 - Independent flightworthiness and mission assurance certification
 - Manage risk systematically and proactively
 - Conduct extensive post-flight assessment
 - Institute key lessons learned as best practices

Overarching Rule: Mission Success is Job #1

Advantages of Net-Centric Operations

“... Single most transforming thing in our force will not be a Weapon System, but a set of interconnections...”

— Secretary of Defense Donald Rumsfeld, August 2001

- Global situational awareness
- All-terrain mobile operations
- Near-real time sensor-to-shooter connectivity
- Fusion of multi-source intelligence
- Reach-back for deployed forces worldwide to Continental U.S.



***Secure Global Interoperable Infrastructure –
“Any Time, Any Place”***

Features of Net-Centric Operations

- Universal IP networking
- High speed backbones using optical communication
- Multiple security levels
- Dynamic resource allocation
- Small robust terminals

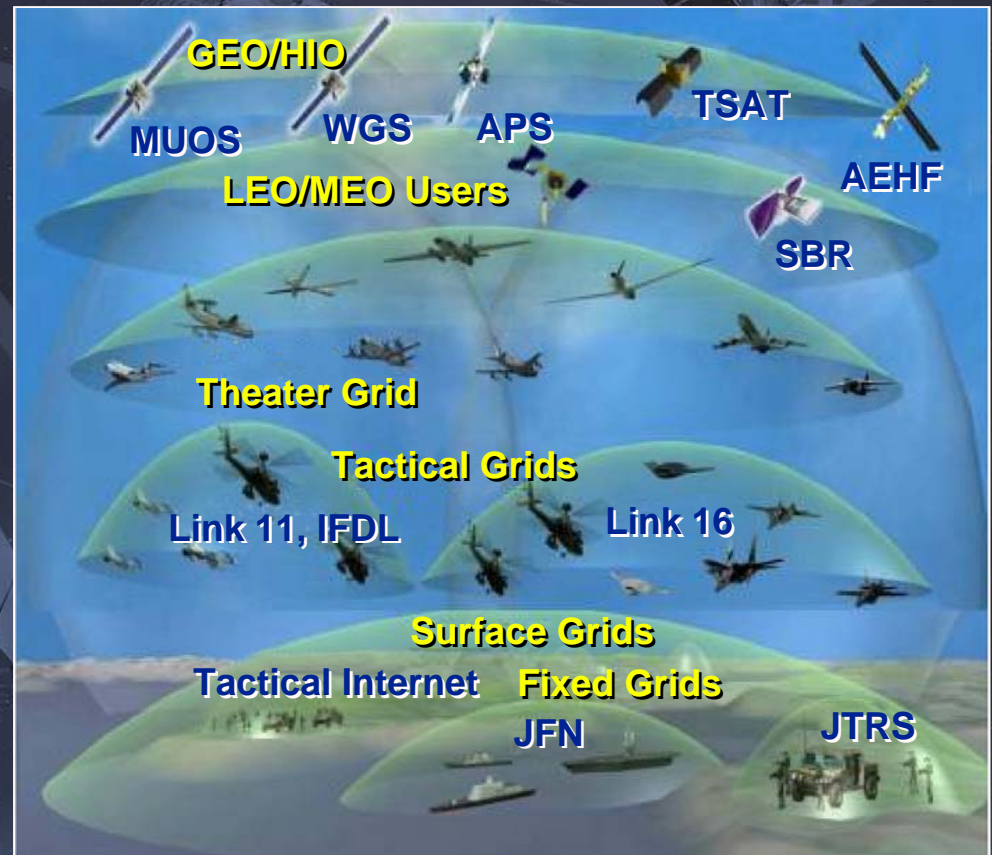
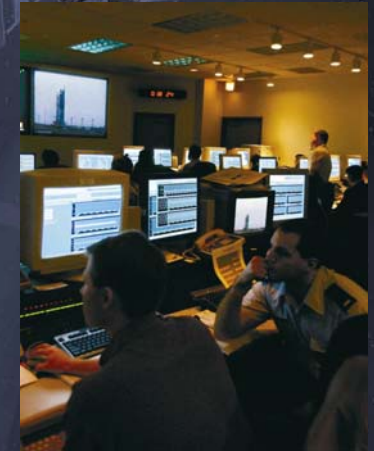


Illustration courtesy of U.S. Air Force.

Software Driven - Information on Demand from All Sources

Network-Centric Challenges

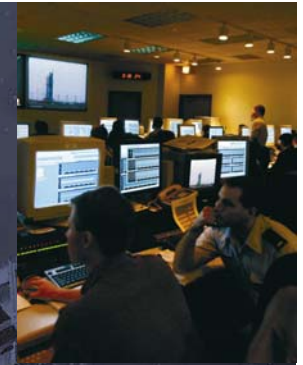
- Maintaining current services while transitioning to internet-based technologies
- Government and industry support of architecture-level integration
- Planning long-lead space developments while undergoing rapid changes in communications technologies
- Reconciling DoD and Intelligence Community needs to achieve transparent interoperability



These Challenges Are Driving Ground Systems

GSAW Reflects Ground System Trends

- Increasing collaboration toward common solutions
- Greater user involvement
- Increasing focus on the role of industry standards
- Evolving architecture tools, methods, and technologies



GSAW Has Created a Community to Address Ground System Issues

Ongoing Challenges for GSAW

- GSAW has been a forum for collaboration toward common solutions since its inception
- The challenge for GSAW is to work on addressing today's most important problems
 - Overcoming acquisition lapses
 - Facilitating the transition to network-centric operations



GSAW2005: Collaboration and Common Solutions

Welcome Address



Brigadier General Larry D. James
Vice Commander, Space and Missile Systems Center
Air Force Space Command
Los Angeles Air Force Base