Headquarters U. S. Air Force

Integrity - Service - Excellence

Systems Engineering – Flight Path to Excellence

Colonel Ralph DiCicco
Acting Director,
Acquisition Center of Excellence
16 November 2004

U.S. AIR FORCE

SE End-State

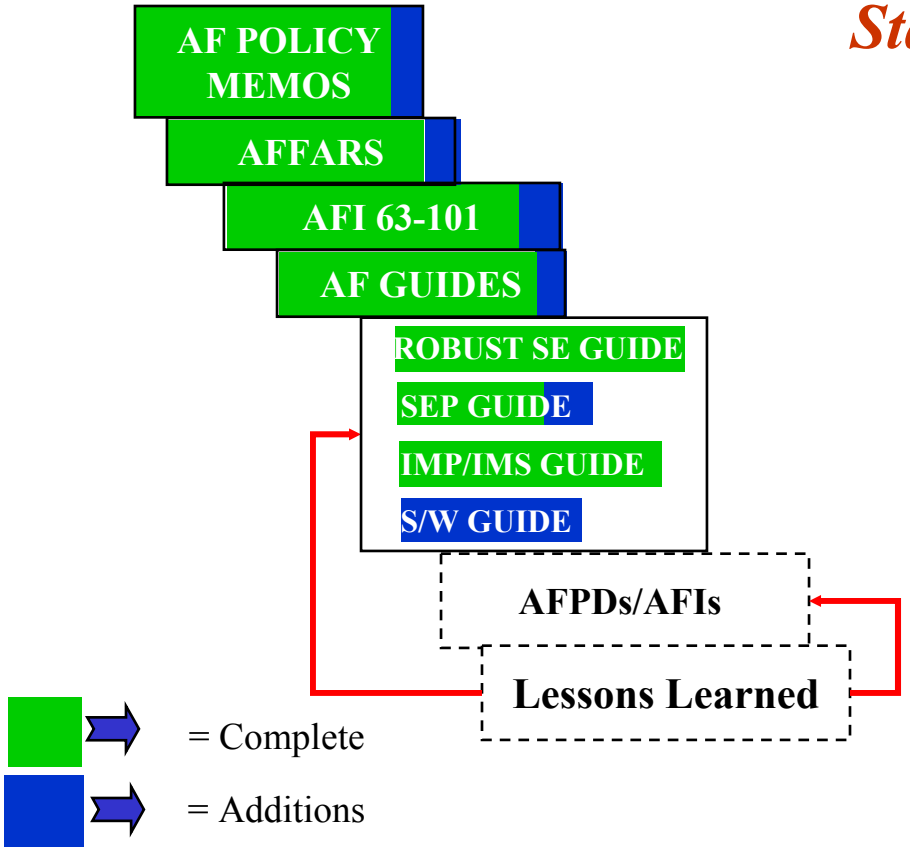
Meet the warfighters performance requirements

AND

- Products/systems that exhibit attributes of spiral capable/robustness:
  - Are easily scalable/expandable to meet future capability needs
  - Are desensitized to expected variability in manufacture and use
- Meet cost and schedule targets – less surprises

Supports Evolutionary Acquisition Strategies!

What We Have Done



Started Summer of 2003:

- Elevated SE in Source Selections
- Defined Outcomes – Robust Systems
- Require SE Plans
- Incentives for Good SE
- Developed Leading Indicators
- Established Center For SE
- Implemented Guidance
- Engaged all communities

Institutionalized SE = Leadership - Direction - Resources

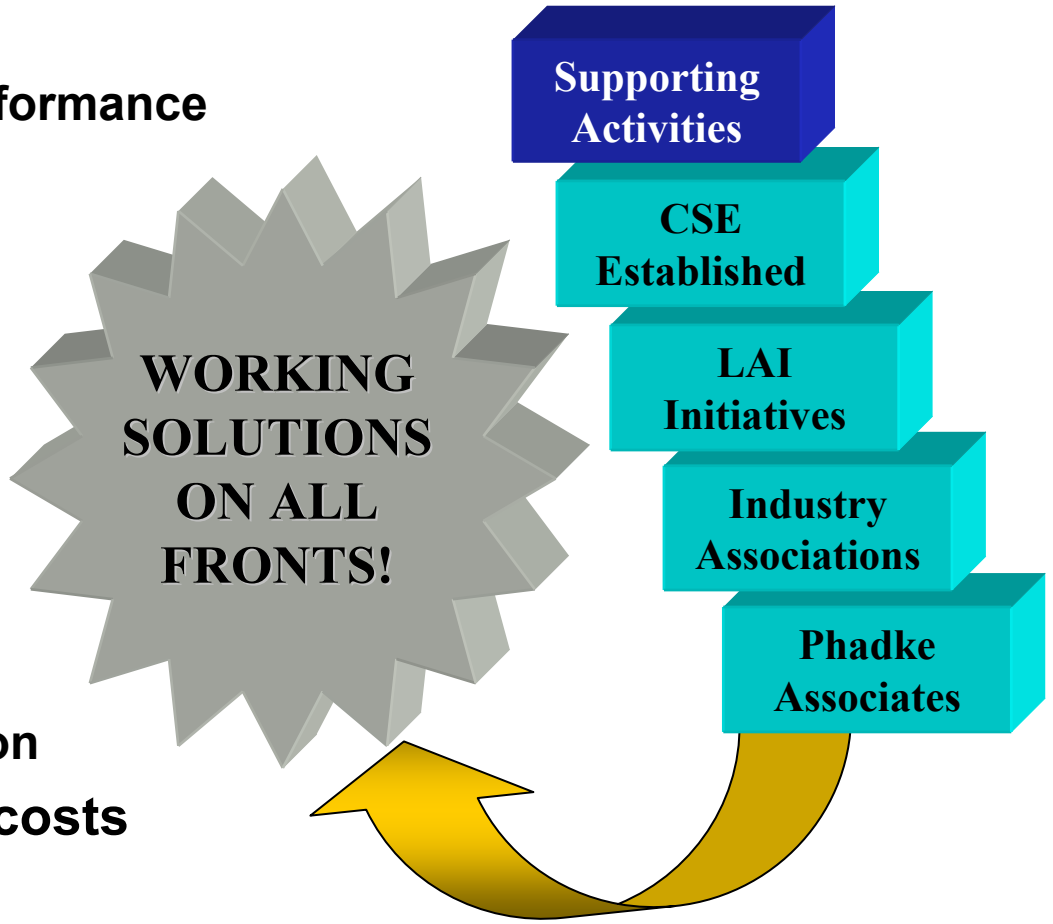
U.S. AIR FORCE

Other Avenues to Success

- AFMC EN Directorate
- Center for Systems Engineering
- Lean Aerospace Initiative (Consortium)
- Software Engineering Institute
- Industry Associations
- Private Consultants (Phadke Associates)

Difficult Issues We Continue to Work With All Communities

- How to Incentivize Good SE
  - In RFPs
  - During contract performance
  - Sustainment
- Leading Indicators
  - Development
  - Production
  - Sustainment
- Workforce
  - Skills required
  - Training
  - Continuing education
- Funding upfront SE costs



Back-up

U.S. AIR FORCE

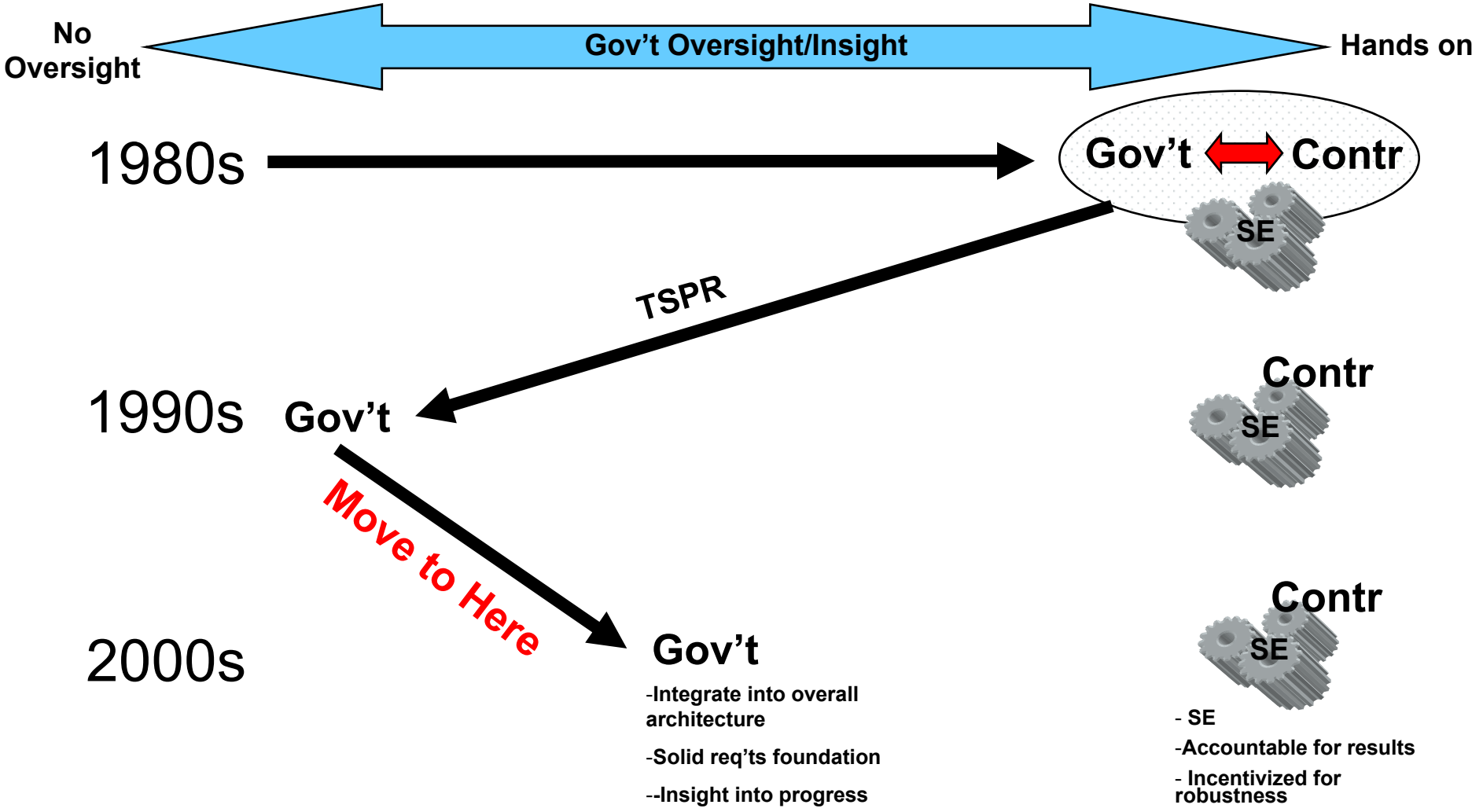
A Reminder – Why the Emphasis on SE?

- Evolutionary Acquisition (EA) is the "norm" for how the AF procures future systems
  - Robust SE minimizes scrap/rework and build/test/fix cycles in Spiral & Incremental Development
- SE capability (both Government & Industry) has declined in recent years
- Good SE can mitigate program "surprises"
- Systems becoming more complex
  - System of Systems (SoS)
  - Family of Systems (FoS)

Excellence in SE Even More Important Today!

SE – Where We Have Been

U.S. AIR FORCE



U.S. AIR FORCE

What We Are Doing Now

Developing strengthened policy/guidance for:

- SE participation during Capability development –
  - Includes Pre-Milestone A focus
    - First "trades" are made here
  - Capability requirements should include attributes of robustness
- Translation of SE requirements:
  - SOO/SOW > System Specification >Contract Baseline
  - Incorporating critical elements of the contractor proposed SEP to the contract
  - Address flow-down of SE requirements
- SE and the Test Planning process
- SE during sustainment phase of Acquisition

U.S. AIR FORCE

Institutionalizing SE Excellence

- **Long term leadership support**
  - OSD & AF Senior Career staff
  - AFMC/EN
  - Center for Systems Engineering (CSE)
- **Seamless policy and procedures**
  - From requirements to sustainment
- **Skilled and committed workforce**
  - Established CSE
  - Education/Training – broad support in academia

Leadership - Direction - Resources

LAI Consortium and Academia Fully Engaged

U.S. AIR FORCE

Fast Track SE Research

LAI Initiatives on Systems Engineering

SE Learnings from Lean Now Projects
Workshop on System Robustness
Robust SE Best Practices Study
"Lean Systems Engineering" Pilot Projects

Knowledge gaps

Longer Term SE Research

Recommended Policy Changes

Robust Engineering Guide (Updates)

Best Practices & Research Reports

. . .

Lean SE Practices

Workforce Development & Education – Academia -- Government -- Industry

Building Blocks to Robust SE

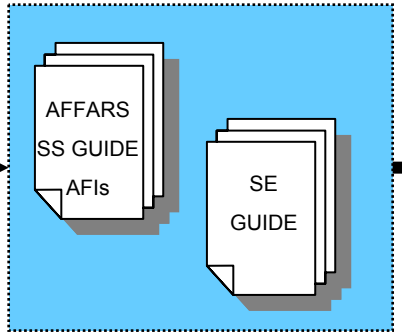
U.S. AIR FORCE

COMPLETE - ON-GOING - FUTURE ACTION

-ASSESS PROGRAMS

-SUGGEST INCENTIVES

--INCLUDE SE STATUS IN REVIEWS



- DEFINE STANDARDS

-EVALUATION OF SE IN PROPOSALS

-EVALUATE SE PERFORMANCE

-- INCENTIVES

- FOCUS ON WORKFORCE ISSUES

Robust SE & Agile Acquisition

U.S. AIR FORCE