The Air Force’s Perspective

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Overview

- Requirements and Test Training
- Test Fleet
- T&E Infrastructure
- Range Requirements
- PBD 703: Direct Funding
- PBD 703: NFAC
- Seamless Verification
- Spiral to War
Requirements and Test Training Today

- Limited formal requirements training currently available
- Limited formal training for some key AF test domains
  - Space Vehicles
  - UAVs
  - Weapons
  - Sensors, EW, IO, and C4ISR
  - Integrated systems and systems of systems
- Available training is stovepiped and fragmented
  - No centralized or coordinated oversight of training
  - No formal process for reviewing training requirements
Requirements and Test Training
A Better Way

Requirements and Test Institute

MAJCOM and SPO Staffs (Requirements)

Test Squadrons
Air  Info Ops  C4ISR
Space  Weapons  EW
Test Fleet

- Fleet representative A/C essential to meaningful testing

- Current test fleet composition
  - Limited fleet representative A/C (54%)
  - Organic fleet largely made up of aging A/C
  - Significant number of borrowed A/C

- The future of the AF test fleet – a new paradigm
  - Program for A/C to support test requirements (F/A-22)
  - Borrow A/C from depot for follow-on testing (RQ-4)
  - Borrow A/C from field for follow-on testing (C-130)
Test Support Fleet

- A/C must be fleet representative for supportability
- Current test support fleet
  - Limited fleet representative A/C (40%)
  - F-16 Coral Phoenix – only supportable for 5-7 years
  - T-38 A/B – not supportable long-term
  - C-12 – no GPS
- The future of the AF test support fleet?
  - Next generation technology will drive support fleet needs
  - Upgrade / replace aging test support A/C
  - A/C must be fleet representative to keep costs in line
Challenges on the horizon will require a new paradigm

AF must include test fleet in force structure programming

CAF / MAF commitment needed for continued success
T&E Infrastructure

R&D

Subsystem Integration

System Function

Operational Test

Battlespace Integration

Developmental Test

Subsystem Ground Test

Labs
Computers
Modeling & Sim

Bench Test
Propulsion Cells
Ground Test
Software Labs
Wind Tunnels
Climatic Labs
Computers
Modeling & Sim

Anechoic Chamber
Radar Measures
Open Air Ranges
Instrumentation
Telemetry
Ground Control
Ground Test
Climatic Labs
Computers
Modeling & Sim

Threat Sim
Targets
Weapons Ranges
EW Ranges
Open Air Ranges
Instrumentation
Telemetry
Ground Control
Computers
Modeling & Sim

Bandwidth
Net-centric Ranges
Live-Virtual-Const
(LVC) Simulation
Operational Threat
Matrix
Targets
Weapons Ranges
EW Ranges
Open Air Ranges
Instrumentation
Telemetry
Ground Control
Computers
Modeling & Sim
T&E Infrastructure

- T&E requires costly / specialized infrastructure

- Facilities
  - Airfield pavements
  - Mission support and training facilities
  - Unique structures to house specialized equipment

- Equipment
  - Wind tunnels
  - Climatic and anechoic chambers
  - Simulators and high-powered computers
T&E Infrastructure Challenges

- Numerous studies conclude recap rate is inadequate
  - Warfighting technology evolving more rapidly than ever
  - AF recap standard is 67 years ... T&E may require 36-year recap

- Existing infrastructure has limitations
  - Large footprint weapons (DE, super- / hypersonics, etc…)
  - Larger bandwidth requirements
  - Systems of systems

- Next wave of new systems will only add to the stress

- Changes to T&E programming rules

- Base Realignment and Closure (BRAC)
Protecting T&E funding for Indirect costs is essential

Plan for current / future systems (space / hyper-sonics / DE)

BRAC may drive consolidation and present opportunities
Range Requirements
Future Weapons

Gravity

Glide

Powered

Hypersonic

Standoff Ranges

MILES

10

50

100s

1000s
Range Requirements
Weapon Footprint

- **SDB (w/out FTS)**
  - 30 kft, 0.8 M

- **JASSM (w/FTS)**
  - Medium Altitude, 0.7M

DoD Land
DoD Airspace

- Edwards
- White Sands
- UTRR
- China Lake
- Nellis
- Edwards
- Eglin
Range Requirement Resolution

- Immediate Need
  - Small Diameter Bomb (SDB)
  - Joint Air-to-Surface Standoff Missile (JASSM)

- AFMC Studying Alternatives
  - Defining Requirement
  - Analyzing Alternatives

- Hq AF will staff proposed solution

Starting with FY2006, institutional and overhead costs for Major Range and Test Facility Bases (MTRFB) transferred from customer to institutional T&E accounts.

Approximately $270M transferred from customer to institutional accounts in FY06.

- FY 07: $277M
- FY 08: $287M
- FY 09: $297M
- FY 10: $307M
- FY 11: $318M
PBD 703: National Full-Scale Aerodynamic Complex (NFAC)

- The NFAC is comprised of two wind tunnels (40’x80’ and 80’x120’) at NASA Ames Research Center, CA.
- NASA mothballed NFAC in FY 04.
- PBD 703 provided FY 06-11 funds for the AF to “initiate upgrades, restore the NFAC to full operational capability in FY 07, and sustain the facility thereafter.”
- Funding profile is:

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- Current Status:
  - AFMC will execute NFAC reactivation through AEDC.
  - Congressional new start notification is in coordination.
  - Initial planning discussions between AEDC and Ames are ongoing.
Seamless Verification
Philosophy

- Full collaboration between AF Requirements-Test-Acquisition
  - Requirements written by user, testers and acquirers—*together*
  - Capabilities-focused, realistic and testable
- Testers assume higher level of responsibility for success
  - DT develops technology/reduces risk—demo system performance
  - OT responsible for “vectoring” program to a successful IOT&E
  - IOT&E – Becomes a capstone “graduation event”
- Fully Integrated T&E—more than just Combined DT/OT
  - All T&E stakeholders (CT, DT, OT) integrate efforts from Day 1
  - More DT/OT integration = *blurring of traditional lines*
Test Requirements vs Warfighter Needs

A Prudent Balance

- Global Hawk
- Predator
- Sniper/Lightning
- JDAM Mk 82