Overview

- 86 FWS Program
- Ranges and Targets
- Instrumentation / Data Collection
- Statistical Methods
- Future Focus
“Evaluate the effectiveness, maintainability, suitability, and accuracy of precision guided munitions and high technology A/G munitions from tactical deliveries against realistic targets with realistic enemy defenses.”
A/G WSEP Mission

- End-to-end Evaluation
- Integral Part of AF / DOD Life Cycle Acquisition and Sustainment Program
- Not just ACC…Evaluations Support AFMC / DoD WRM Considerations
  - Extensive Program Office liaison
  - Symbiotic relationship (Hardware & Software)

1986: 9 Units / 50 Weapons

2007: 19 Units / 369 Weapons

Aug 08: 7 Units / 183 Weapons

We Own a Growth Industry

- Annual program resource requirements (infrastructure, funding, manpower) increasing in scope commensurate with rapid rise in CAF PGM capabilities

- Sustained requirement is 20 WSEPs annually with a 22-24 WSEP “surge” capacity in any given year employing 350 weapons
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<th>Platform</th>
<th>Guided Bomb Units</th>
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FY07 - 12 Platforms
39 Weapon System Combinations
A/G WSEP Mission Execution

- Fighter Squadrons Deploy to Eglin and Hill AFB
  - 8-12 jets; one and two week evaluation deployments
  - Typical unit 12-18 aircrews; 100-150 people deployed
  - Ammo troops up front (2 wks early)

- Bomber / UAS Squadrons Execute From Home Station

- Hammer Constructs Realistic Scenarios

- Weapons, Platforms, and Targets “Instrumented”

- Hammer Collects Data, Conducts Analysis, and Determines Weapon System Effectiveness
Ranges and Targets

- **Eglin (35%)**
  - High humidity / green environment
  - Shoot cones more restrictive
  - Moving target
  - Urban CAS village (FY09/1)

- **UTTR (65%)**
  - Desert / barren environment
  - Permissive shoot cones
  - Urban CAS village
  - Moving target
  - High speed moving target (FY09/4)
Ranges and Targets

Area Targets

Static Tank Array

Mover Track
Ranges and Targets
Ranges and Targets

EGLIN RANGES

Hill AFB

~10 miles
Ranges and Targets

Mover
Circle
APC
Convoy
Urban Village
Ranges and Targets
Ranges and Targets
Ranges and Targets
China Lake Mover
Instrumentation / Data Collection

- **Time / Space / Position / Information (TSPI)**
  - Radar tracking
  - Global Positioning System (GPS)
  - A/C AVTR / DVR-S

- **Telemetry**
  - Used to the maximum extent possible
  - Assess weapon performance--launch to impact
  - Paveway / AGM-130 exceptions

- **Improve Laser Tracker (ILAST)**
  - Measures laser designator performance
    - Power output, spot stability, and spot position
    - Boresight check
Videometric Analysis System (VMAS)
- Measures weapon impact conditions
- Impact angle, bomb body yaw, and impact position

Effects (LPA)
- Video record of target condition - before / after
- Video record of munitions impacts relative to DPI / DMPI

Chase Aircraft
- Assess tactics and weapon performance post release
- Ensures range safety
- Fills in where no telemetry available
- Desired - not required
Statistical Analysis

- 8 Evaluation Phases
  - Munitions buildup
  - Ground, enroute
  - Employment, guidance, fuzing, warhead, target damage

- Probability of Success
  - Encompasses all phases except munitions buildup

- Probability of Hit
  - Encompasses last 5 phases
  - Probability of target damage given the opportunity to employ

- Non-chargeable Interruptions
  - Weather, range closure, TM failure

**Statistical Analysis**

**PROBABILITY OF SUCCESS** ($P_s$) = 0.38

**PROBABILITY OF HIT** ($P_h$) = 0.43

### Table

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<th>Ground</th>
<th>Enroute</th>
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**STATISTICAL ANALYSIS**

- **PROBABILITY OF SUCCESS** ($P_s$) = 0.38
- **PROBABILITY OF HIT** ($P_h$) = 0.43

**Summary:**

- $P_s$ = 0.38
- $P_h$ = 0.43

**Evaluation:**

- $P_s$ and $P_h$ are calculated based on various factors affecting weapon systems and their performance.

**Note:**

The values indicate the probability of success and hit for different stages and components of the weapon system. The statistical analysis helps in understanding the effectiveness and reliability of the PGM Weapon Systems.
As defined by COMACC Plan 90:
- 80% confidence level
- 10% accuracy level
- 80% chance Hammer probabilities will be replicated in the real world (+10%)
Statistical Analysis

- Can’t Meet Statistical Significance All The Time
  - Currently 98 different weapons system combinations
  - Goal achievable over 5 year period (7-10 Wpns per Yr)

- Confidence Level Does Not Differentiate Between:
  - Different delivery parameters
  - Environmental factors
  - OFP changes
  - Scenario
Future Focus

- Combined Archer / Hammer
- ACC drawdown vs. USAFE / PACAF / ARC
- Weapons
- Telemetry
- Emitters

Video
Combat Hammer Charter

- **EMPLOY** A/G PGMs and High Technology Weapons
  - A/G WSEP “COMBAT HAMMER”
  - Investigative Firing Program

- **ASSESS/VALIDATE** Combat Capabilities
  - Total weapons system
  - “Storage through impact”
  - Ops units, combat realistic scenarios, and realistic threat replication

- **IMPROVE** A/G PGM Effects
  - Telemetry
  - Recommend changes
  - Maintain comprehensive database

- **PROVIDE** Expertise on Demand
  - “ON-CALL” capability