Impact of Peace Operations Deployments on USAF Fighter Crew Combat Skills

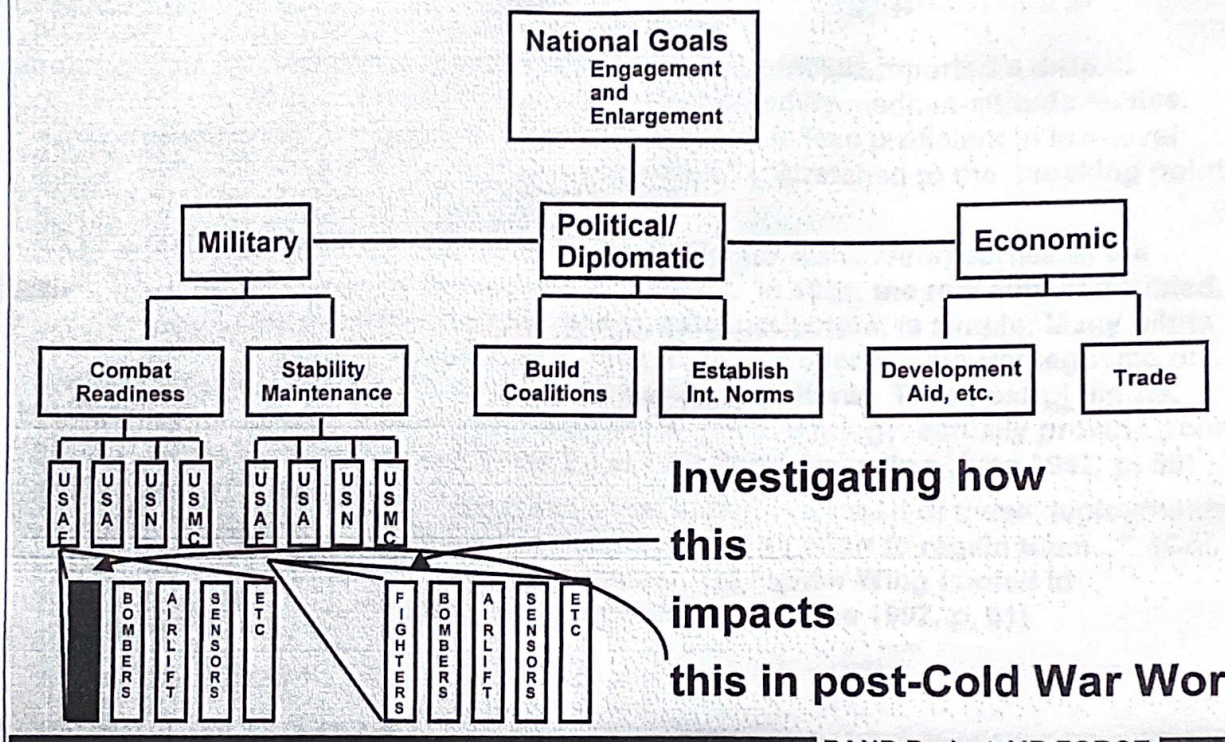
key to dive bombing

Dive Bombing

ensign of lack of practice

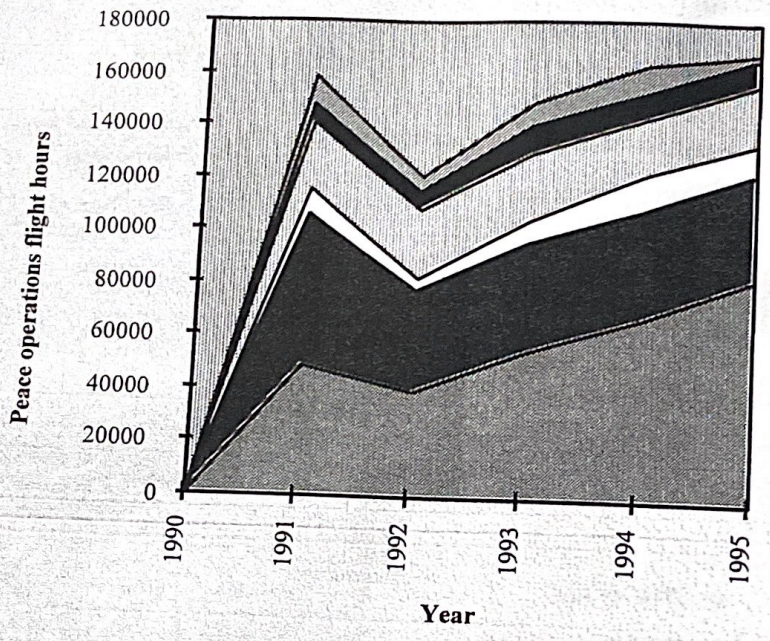
John Stillion

June 17, 1998


National Goals
Engagement and Enlargement
Military
Political/ Diplomatic
Economic
Combat Readiness
Stability Maintenance
Build Coalitions
Establish Int. Norms
Development Aid, etc.
Trade
USAF
USA
USN
USMC
USAF
USA
USN
USMC
BOMBERS
AIRLIFT
SENSORS
ETC
FIGHTERS
BOMBERS
AIRLIFT
SENSORS
ETC
Investigating how this impacts this in post-Cold War World

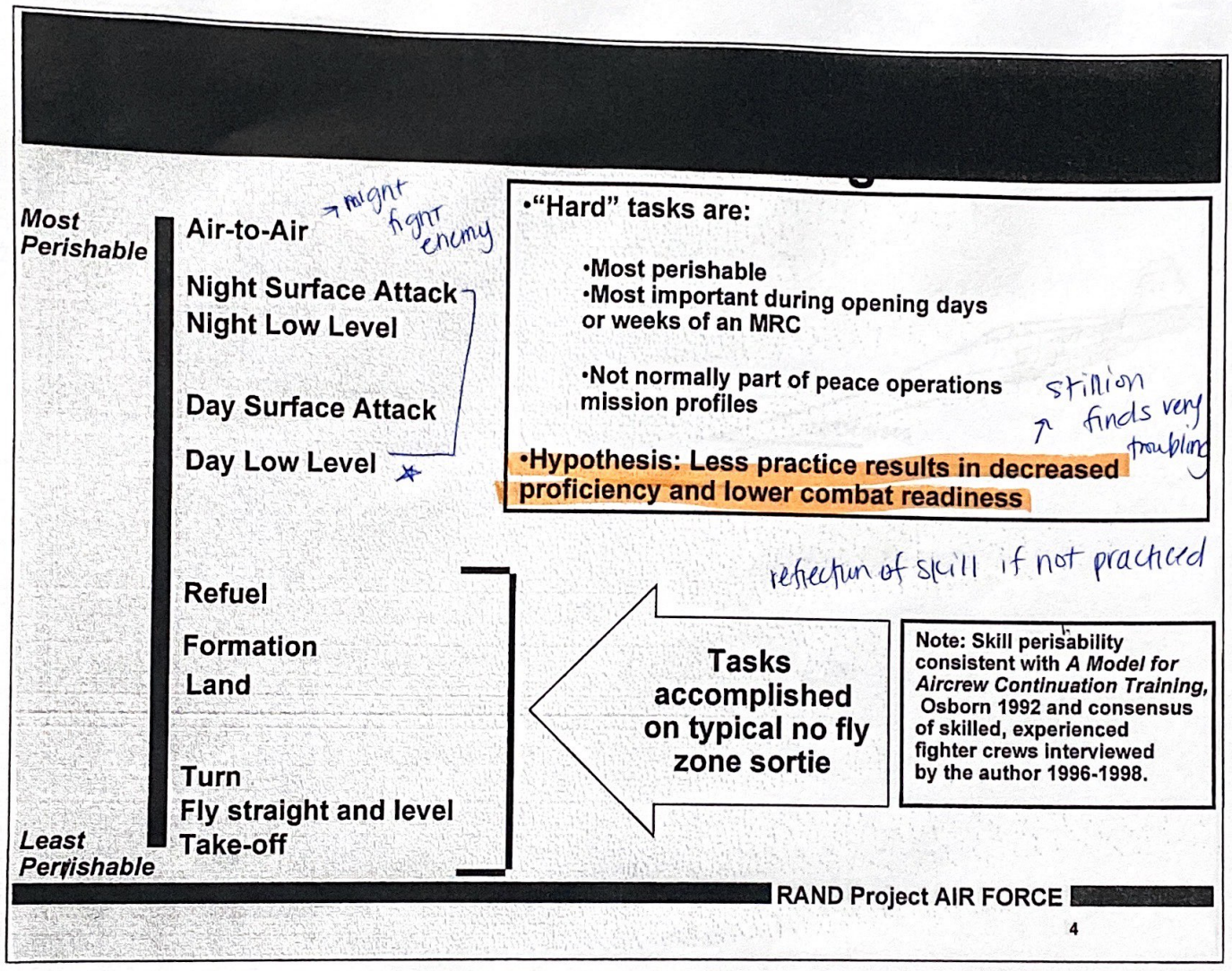
Air Force Fighter

- "At the Air Force Fighter Weapons School, officials reported a drop in proficiency of incoming students. They could fly medium-altitude tactics, skills used in no-fly zone operations, but were less proficient in low-level tactics needed for high-intensity conflict." ("Stretched to the 'breaking point,' *Air Force Times,* April 21, 1997, p. 3-4)
- "In 1995, the bust rate for BFM (Basic Fighter Maneuvers) sorties at the (Fighter) Weapons School was 21 percent. In 1996, the rate almost doubled, to 37 percent. The principal reason, said instructors, is simple: Many pilots have spent long tours flying dozens of sorties over Bosnia-Hercegovina or Iraq in support of Air Force contingency operations. These patrol flights, while important to the execution of US global strategy, actually provide poor training." ("Readiness at the Edge," Air Force Magazine, June 1997, p. 58)
- "It is the advanced combat skills that suffer as a result of these deployments, and it takes a significant but essential training effort to regain them..." (Col. William D Carpenter, Vice Commander, 1st Fighter Wing quoted in "Readiness at the Edge," Air Force Magazine, June 1997, p. 61)



# of flight hours by type of Air flight flown

- C-130
- Electronic Combat
- Surveillance
- SOF C-130s
- Tankers
- Fighters


Most Perishable
Air-to-Air
Night Surface Attack
Night Low Level
Day Surface Attack
Day Low Level
Refuel
Formation
Land
Turn
Fly straight and level
Take-off
Least Perishable
•"Hard" tasks are:
•Most perishable
•Most important during opening days or weeks of an MRC
•Not normally part of peace operations mission profiles
•Hypothesis: Less practice results in decreased proficiency and lower combat readiness
Tasks accomplished on typical no fly zone sortie
Note: Skill perisability consistent with A Model for Aircrew Continuation Training, Osborn 1992 and consensus of skilled, experienced fighter crews interviewed by the author 1996-1998.
RAND Project AIR FORCE
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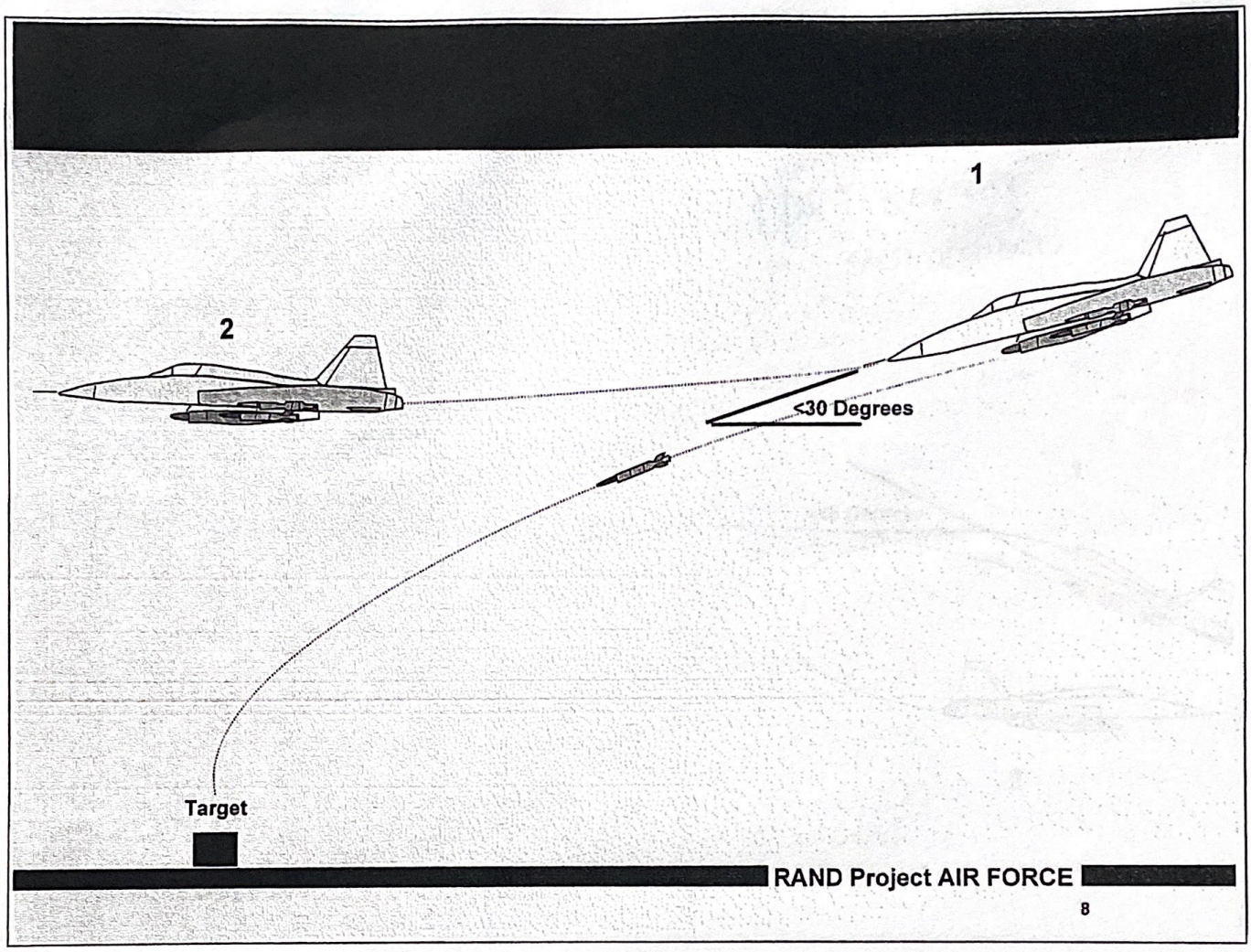
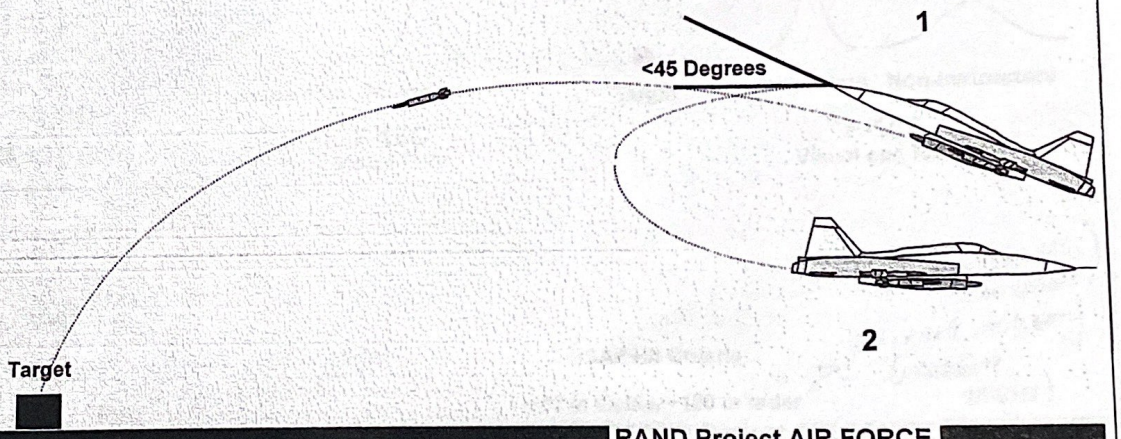


RAND Project AIR FORCE

LOFT delivery
(less accurate)

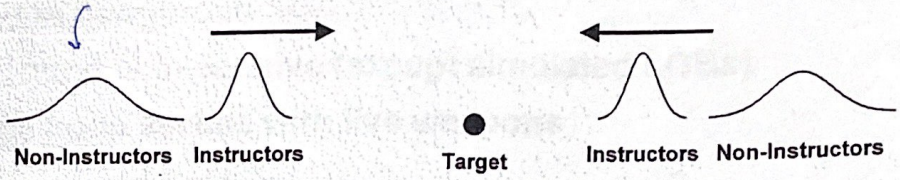


Examined F-15E and F-16C low level bombing accuracy

- Found a main effect for instructor status
- Found an incremental effect for each practice bomb dropped

Every practice bomb dropped in preceding 30 days moves all means in about 12 to 18 inches

bell curve



F-16C
Visual Only

F-15E
Visual and Radar

(accuracy is less than visual)

assistant delivery (visualize target)

USAF Hit Criteria

~30 m visual, ~100 m radar

Based on Saudi Arabia.

Assumptions:

- Can not conduct routine training with live weapons on the wings
  - Air to air is dangerous
  - Air to ground is expensive (except simulated LGBs)
- Must fly no fly zone sorties with live weapons

Saudi Arabia

Data on 55 F-15E crewmembers from 335 FS

measure on and around deployment

Includes:

- Total flight hours
- Fighter hours
- F-15E hours
- Instructor
- Deploy Feb-Jun 1997
- Bomb delivery attempts, hits, and circular error for both radar and visual deliveries most likely to be required at beginning of MRC for Jan-Nov 1997

Many analysts inside and outside USAF believe USAF crews will fight the next war from medium altitude using PGMs

- Believe low level bombing skills are "Cold War relics"
  - 1997 ACC directive states now no reason for fighter crews to fly below 500 feet
    - Desert Storm crews qualified to 300 feet and many to 100 feet
  - Typical F-16C LANTIRN squadron qualifies all pilots to deliver PGMs from medium altitude, but less than 20 percent are qualified for low level deliveries
    - Units want to eliminate even this residual capability

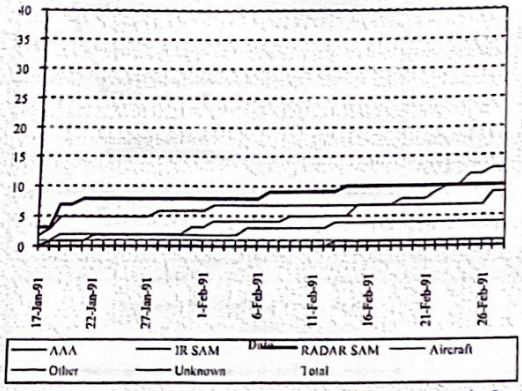
Still an issue
Still think it is important

Radar SAMs most lethal threat first 3 days of Operation Desert Storm

- Killed 7 of 16 aircraft lost
- Effective despite coalition crews use of low level tactics that minimized radar SAM effectiveness and maximized effectiveness of AAA and IR SAMs
- Analysis of non-stealth aircraft medium altitude performance against intact Radar SAM defenses suggests coalition could have lost 45 aircraft in the first 2 days of an "all medium altitude war" to Radar SAMs - 20 percent more than lost to enemy action in entire war

Low level training important for robust USAF combat capability

Combat in 1991

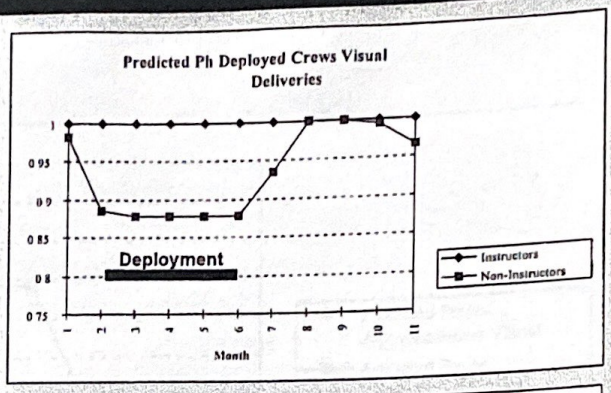


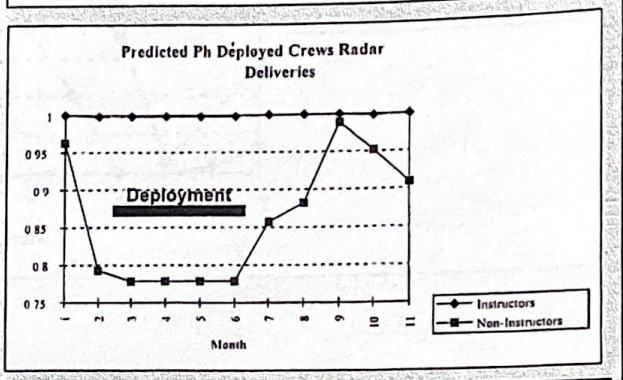
surface to air missle

minimized exposure to surface to air missle

Predicted probabilities of hitting a target based on:

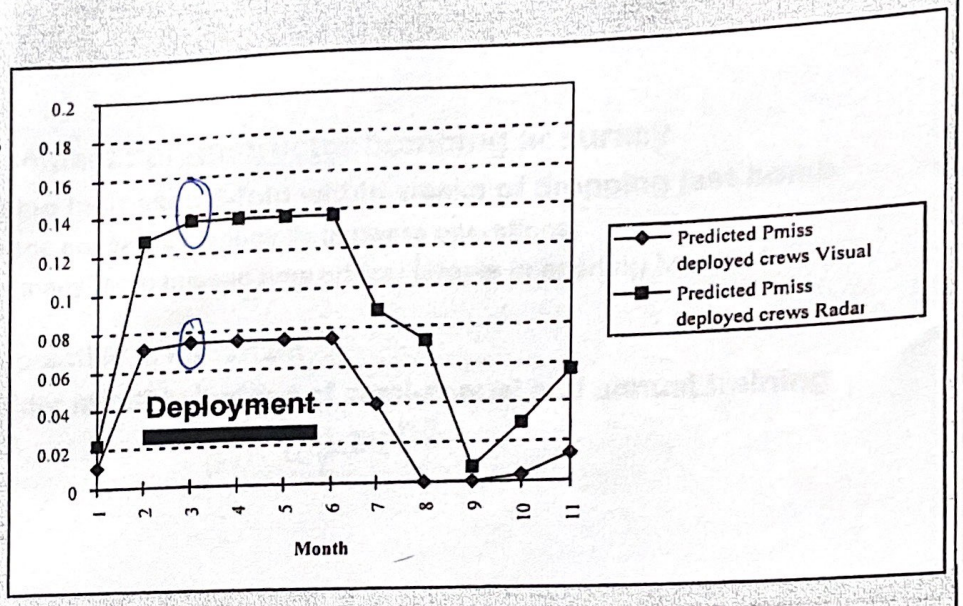
- model coefficients
- actual number of deliveries for instructors and non-instructors
- USAF hit criteria
- Assumes normal error distribution
- P_{miss} for non-instructors increases by a factor of five during deployment
- ~65 percent of deployed crews are non-insturctors





Predicted probability of missing a target based on:

- model coefficients
- actual number of deliveries for instructors and non-instructors when deployed in 1997
- USAF hit criteria
- Proportion of instructors and non-instructors
- Assumes normal error distribution



Recent practice has little impact on instructor bombing accuracy

- Talent factor
- Effect of instructor training process
- Both

Recent practice does impact non-instructor bombing accuracy

- Probability of missing increases 5-fold within weeks of dropping last bomb
  - Collateral damage concerns (especially in peace operations)
  - Could result in many more missed time critical targets in opening hours of campaign
- Implies consistent practice is important
- USAF should consider monthly instead of semi-annual and annual training requirements/goals

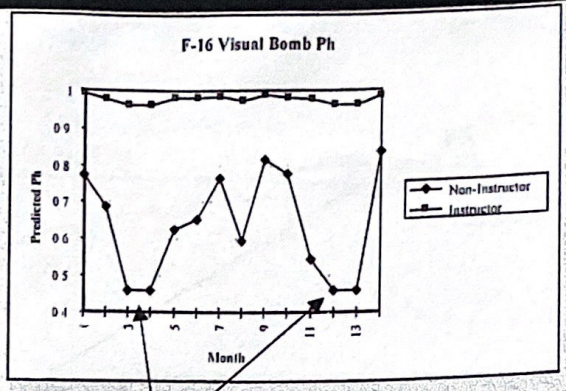
• loss capability

Estimated similar model for F-16C crews

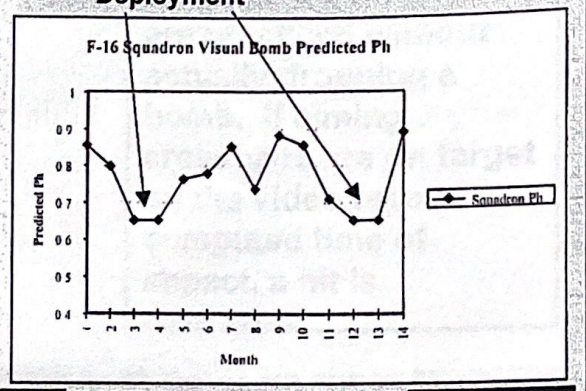
- Again instructor status and bombs in last 30 days best predictors

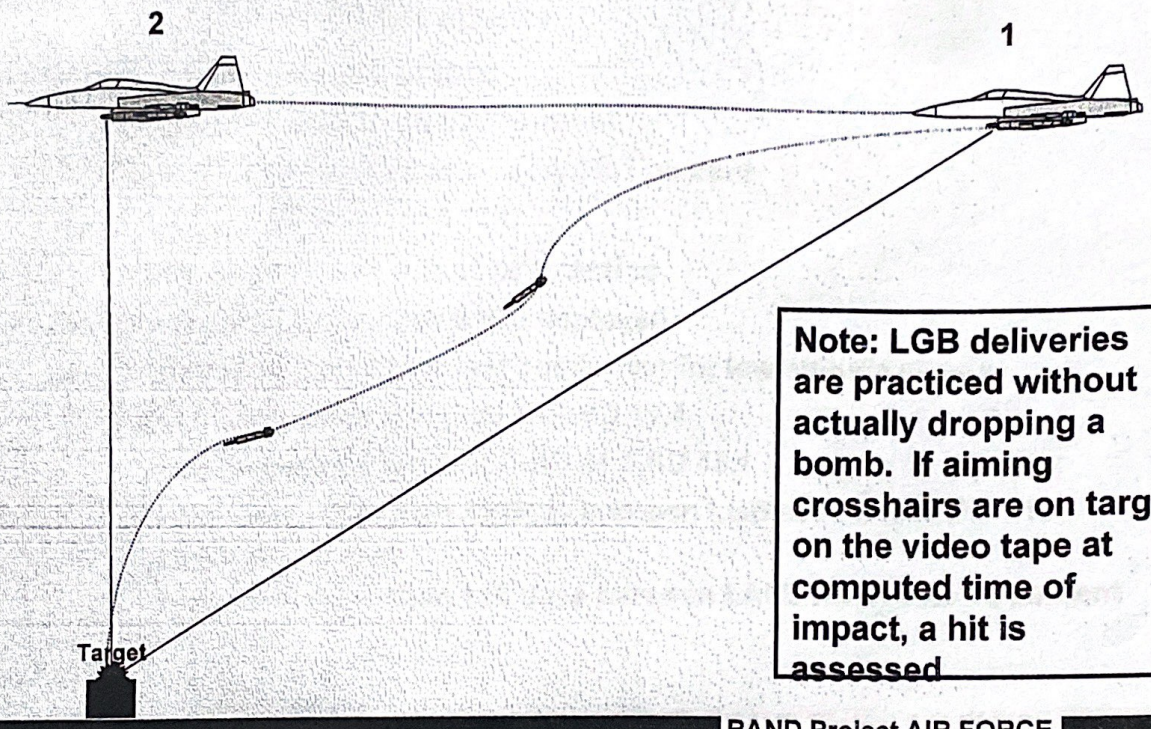
Predicted probability of missing a target based on:

- model coefficients
- actual number of deliveries for instructors and non-instructors when deployed in 1997 and 1998
- USAF hit criteria
- Proportion of instructors and non-instructors
- Assumes normal error distribution



Deployment





Note: LGB deliveries are practiced without actually dropping a bomb. If aiming crosshairs are on target on the video tape at computed time of impact, a hit is assessed

→ laser guided bombs

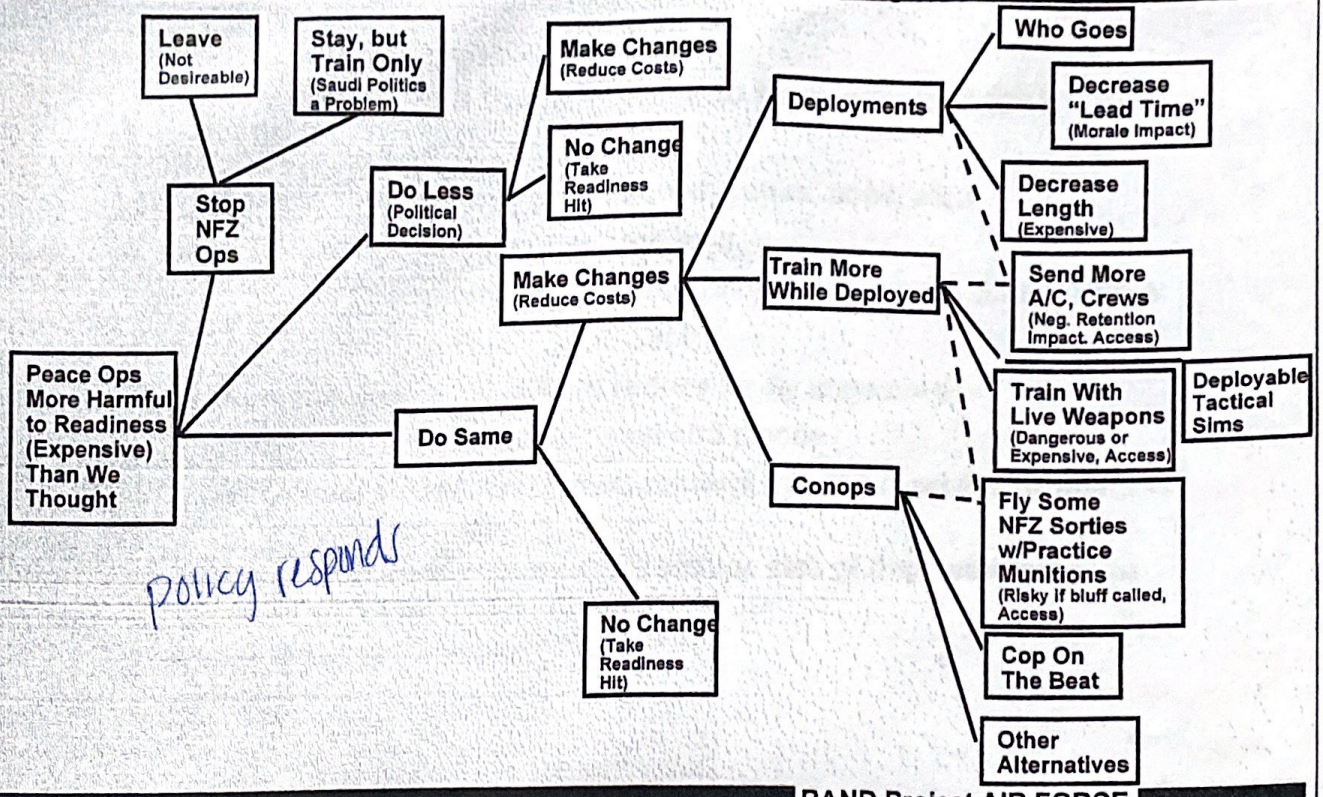
Analyzed 465 simulated LGB attacks

Found main effect for instructors

- Instructors assessed to hit 87.5 percent
- Non-instructors assessed to hit only 79.3 percent
- Significant at 0.05 level (p=0.038)

No statistically significant effect of practice

- Crews were able to practice while deployed
- Less variation in days since last bomb than for low altitude events
  - Mean days since last LGB 10.9 SD 11.4
  - Mean days since last LALD/HD 41.1 SD 45.1
  - Crews went more than 30 days between LGB events less than 10 percent of the time
  - Crews went more than 110 days between LALD/HD events 10 percent of the time


Leave
(Not Desireable)
Stay, but Train Only
(Saudi Politics a Problem)
Stop NFZ Ops
Peace Ops More Harmful to Readiness (Expensive) Than We Thought
Do Less
(Political Decision)
Make Changes
(Reduce Costs)
No Change
(Take Readiness Hit)
Do Same
Make Changes
(Reduce Costs)
No Change
(Take Readiness Hit)
Deployments
Who Goes
Decrease "Lead Time"
(Morale Impact)
Decrease Length
(Expensive)
Train More While Deployed
Send More A/C, Crews
(Neg. Retention Impact. Access)
Train With Live Weapons
(Dangerous or Expensive, Access)
Deployable Tactical Sims
Conops
Fly Some NFZ Sorties w/Practice Munitions
(Risky if bluff called, Access)
Cop On The Beat
Other Alternatives
policy responds

Could deploy more aircraft to allow some to be configured for training

- Expensive
  - More people (aircrew, ground crew, cooks, cops, etc.)
    - Exacerbate retention problems
- Limited access to bombing ranges and training airspace in Saudi Arabia

Could adopt "Cop on the Beat" approach

- Send same number of aircraft but reduce no-fly zone sorties
  - Show up at unpredictable times and places
  - Remaining aircraft and crews conduct training if access problem is solved
  - If access still a problem simply reduce size of deployed forces to minimize costs
- Reinforce if bad guys act-up

If real goal is to maintain forces in area rather than enforcing no-fly zone (as it may be in Persian Gulf area)

- Admit this to ourselves
- Try to get permission to permanently station forces in area and access to training facilities
- End no-fly zone operations (they are probably hurting us more than Saddam at this point)
- Problem:
  - Permanently stationing forces in Saudi Arabia may not be politically possible
  - No-fly zone "fig leaf" may be the only thing that allows continued significant USAF presence in region