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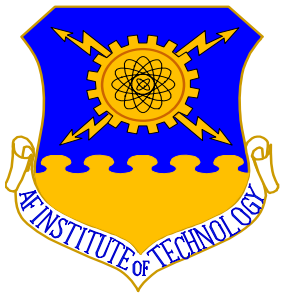

Fighter Pilot Inventory and Requirements Model; A Ten Year Look with Impact of UAV increase

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Fighter Pilot Inventory and Requirements Model

A Ten Year Look with Impact of UAV Increase

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Overview

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- Sources / Literature Review
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Problem Statement

HOW WILL UAV GROWTH AFFECT FIGHTER PILOT MANNING?

- The Predator Unmanned Aerial Vehicle program is slated for a significant increase
  - Approximately 2-3 more active duty squadrons within 10 years
- Directly affects Rated Aircrew Management
  - All UAV pilot billets are currently filled by rated personnel
  - Combat aircrew fill 45% of these billets (mostly fighter pilots)
- Fighter pilot shortage already exists
  - Total Fighter Pilots = 3564
  - Total Fighter Pilot Requirement = 3758

-- Historically, managing fighter pilot requirements has been a continual challenge for the Air Force Personnel Center. (Source 4)

-- Since 1990's drawdown, AFPC has been unable to fill all fighter pilot billets. (Source 2,4)

-- Fighter pilot jobs can be broken down into 4 areas: operational force, training, staff, and man-year requirements. Man-Year requirements primarily include those fighter pilots in formal training courses and in-residence professional military education courses. (Source 2)

-- In recent years, Unmanned Aerial Vehicles have become a highly sought after commodity, and the number of UAV billets have increased, with more increases expected in the near future. Currently 45% of UAV squadrons are manned by combat aircrew. Fighter pilots fills the majority of these slots. (Source 7)

-- This dramatic increase in UAV requirements demands analysis for the impact on fighter pilot requirements. An increase in UAV fighter pilot billets represents a direct increase in force requirements, however, there may be an indirect effect on training and man year requirements.

-- The current fighter pilot inventory can be found in source 7. This current requirement is based current MWS authorizations, current fighter pilot manning levels in alpha tours, and an assumption that 690 fighter pilot staff jobs are authorized. This number is approximate since fighter staff jobs can be filled by pilots or WSO's. RAND forecasted a requirement of 4381 fighter pilots in Absorbing Air Force Fighter Pilots, but this likely includes student pilots still in the training pipeline. (Source 2) Also, actual "requirements" vary based on operational squadron manning levels.

Research Questions

- How will fighter squadron **experience levels** be affected?
- How will fighter squadron **manning levels** be affected?
- How will **fighter staff** manning be impacted?
- Can the current increase of fighter pilots attending **IDE** be sustained?
- Can current fighter pilot **production** support the increase in UAV requirements?
- What is the impact on **training** requirements?

-- Fighter Experience Levels are a critical measure of the “health” of the CAF. (Source 2) An increase in UAV requirements leads to a greater requirement for experienced fighter pilots without an equivalent increase in production of experienced pilots.

-- Operational fighter squadron manning has been greater than 100% in recent years for extended periods in some or all of the fighter airframes in order to attain minimum required experience levels. (Source 2) A UAV increase only adds to requirements and can’t help solve this problem.

-- Staff assignments have been the “shock absorber” in the fighter assignment system. (Source 7) Fighter expertise is required on the staff to help shape the force in a positive way. Additionally, staff assignments are important for career and force development. These jobs have the lowest requirement priority and remain unfilled when fighter shortages exist.

-- IDE in residence opportunities, which are also important for career and force development, have expanded. In effect, this increased IDE opportunity adds to the man-year “requirement” for experienced fighter pilots with no additional production capability.

-- Fighter pilot production is currently at maximum capacity. (Source 2,7) The UAV requirement acts as a parasite to the fighter pilot pipeline.

-- The UAV growth may affect the man-year requirements as more fighter pilots will be required to receive training to re-qualify in their fighter airframe after an assignment in UAVs.

Research Sources

- 1. Aircrew Management Document, Sept 1997, HQ USAF/XOOT
- 2. Absorbing Air Force Fighter Pilots: Parameters, Problems, and Policy Options (RAND Project AIR FORCE, 2002)
- 3. Past and Future of Rated Management (RAND, 2004)
- 4. The Air Force Pilot Shortage: A Crisis for Operational Units? (RAND Project AIR FORCE, 2000)
- 5. Divergent Stability: Managing the USAF Pilot Inventory (SAASS Thesis by Maj. Charles Metrolis Jr., 2003)
- 6. Managing the Pilot Force in an Uncertain Environment (MORS Journal Article of RAND study, 1995)
- 7. Personal Interviews of AFPC Rated Management Personnel, 19-20 March 05.

--The Aircrew Management document is a compilation of distribution plans, papers, briefings, and other data concerning rated management. It begins with a short history of rated management from 1973 to 1997, with an emphasis on the policies put in place in 1996-1997.

-- Absorbing Air Force Fighter Pilots, describes in detail the factors that affect operational fighter squadron experience levels, manning levels, experienced pilot aging rates, and the ability to “absorb” new pilots.

-- Past and Future of Rated Management discusses the AF using the reserve and guard components to help improve fighter pilot manning and experience levels

-- Air Force Pilot Shortage describes the pre-9/11 impending pilot shortage, and recommended to have the guard pick up UFT and FTU instructor pilot billets.

-- Divergent Stability historically examines the AF management of pilot inventory. The author suggests maintaining a strategic pilot force of 300 to augment any shortage in inventory.

-- Managing the Pilot Force looked at the factors that affect pilot inventory and the impending shortage due to projected airline growth.

-- Major Garner visited his gaining unit, AFPC. Several Fighter Porch and Force Development personnel provided insight.

Literature Review

- The fighter pilots inventory is below AF requirements
  - Historical Problem
  - Staff Requirement is the “shock absorber”
  - Parasite systems increase experience requirement

-- Throughout AF history, pilot management has been a challenge. The AF usually had either a surplus or shortage of pilots, except for a brief period during the 1980s. One of the main reasons was the political climate at the time. In the past, the AF was usually short of pilots during a build up to war or in the early phases of war, and then had a surplus post war. (Source 5)

-- During Post Cold War/post Gulf War drawdown of the 1990s, the number of fighter pilots as well as the capacity for producing fighter pilots was reduced significantly. At the same time pilot retention was low due a favorable economy. These factors have led to a shortage of pilots, specifically fighter pilots, despite recent efforts to increase fighter pilot yearly production. (Source 6)

-- To make up for the shortage of fighter pilots, the staff requirements have taken the brunt of the damage. Current guidance has required all cockpits to be filled at 100% while certain staff billets are only required to be filled at 67%. This has multiple impacts, to include Force Development and Career opportunities. (Source 7)

-- The fighter pipeline not only feeds the fighter cockpit requirements, but also non-flying remotes, training billets, staff billets, and parasite systems. Current parasite systems are F-117, F/A-22, and UAVs. These systems do not have their own pipeline, but require experienced fighter pilots. The F/A-22 will continue to be a parasite for several years, as it’s pipeline won’t open until 2008. (Source 7) The recent decision to increase the number of UAV squadrons will have an impact on fighter requirements.

Literature Review

- Fighter pilot inventory has three variables:
  - Production
  - Retention
  - Requirements
- All three variables are dynamic
- AF/DP and AFPC directly manage production and retention
  - Indirectly affect requirements

-- Fighter Pilot manning levels are determined from three factors; fighter pilot production, retention, and AF requirements. (Source 2)

-- Production is defined by the number of fighter pilots produced by the Fighter Training Units (FTUs). Newly training pilots straight out of Undergraduate Flight Training (UFT) and First Assignment Instructor Pilots (FAIPS) go through the Basic course (B-course). The B-course is 6 to 8 months depending on the specific fighter type. The pipeline includes UFT, Introduction to Fighter Fundamentals (IFF), and the B-course. Pilots then are assigned to operational units and are declared Mission Ready (MR) after a few months of theater-specific spin-up. The pipeline training period is a minimum of 2 years, but the real time is closer to 3 years due to training backlogs and dead time waiting for training dates. The end result is that pilots complete fighter FTU and enter the fighter pilot system after 2 to 7 calendar years of service in the Air Force. (Source 2)

-- Retention is defined as pilots who stay on Active Duty after their initial commitment. This commitment was raised from 8 to 10 years after the completion of UFT in 1997. (Source 3)

-- The current AF requirement is approximately 3758 pilots. The current inventory is approximately 200 short.

-- Actions of AF/DP and AFPC control these variables. Therefore any attempt to model the inventory and requirements must account for the types of inputs that these organization use to mold the “system.”

Literature Review

- Production:
  - Programmed for 300 fighter pilots per year
    - Pipeline/FTUs already at max production – limitation is infrastructure
    - Goal is an acceptable absorption rate while maintaining unit experience levels and combat readiness
  - Capacity will vary as F/A-22 builds up while the mighty F-15C, F-16, and A-10 draw down
    - BRAC??

-- Fighter pilot production is currently programmed for 300 pilots per year. (Source 7) This recently dropped from 330. Rand has determined that 380 fighter pilots must be produced per year in order to fill the AF requirement. The 330 per year requirement was set in 1996 at a Four-star rated Summit to meet experience objectives. The 330 goal was only reached in FY 97-99, and more recent production has been closer to 280. (Source 2)

-- Pipelines/FTUs are maxed out. Based on pilot training base reductions and training aircraft UTE (utilization) rates, increasing production is not possible without procuring more bases and aircraft. (Source 4)

-- Absorption is ability for a fighter unit to take in new pilots and "grow" them while still maintaining operational readiness. The goal is to keep units manned with a minimum of 40% experience level. This minimum experience level allows for a properly experiences fighting force and the ability to train and absorb new pilots at a reasonable pace. When too many new pilots are absorbed, experience levels drop, and the time required to become experienced increases. As the number of inexperienced pilots increases, total unit manning must also be increased well above 100% in order to achieve a minimum experience level. Over-manning exacerbates the problem and also increases the average time required for inexperienced pilots to reach experienced status. (Source 2)

-- A pipeline fighter pilot is considered experienced after 500 flying hours in the MWS. A previous FAIP fighter pilot reaches experience after 300 MWS flying hours.

-- A recent RAND study determined that the maximum absorption rate for the CAF, based on current infrastructure and UTE rates is 302 fighter pilots produced per year. (Source 2)

-- Actual production capacity will vary each year based on build-ups, draw-downs, and BRAC.

Literature Review

- Retention
  - Most difficult variable to predict or model
  - Primary retention tool is the bonus
  - Historical Bonus Take Rate (BTR) about 35%
  - Since 9/11, BTR has increased
    - FY 2001 BTR 30%
    - FY 2002 BTR 46%
    - FY 2003 BTR 60%
  - Overall historical retention by Calendar Years of Service (CYOS) more stable

-- Retention has always been an issue for Air Force. It has varied considerably based on changes in requirements, deployments levels, the national economy, and many other factors. (Source 6) Therefore it is the most difficult variable to predict or model.

-- Pilot Bonus Pay started in 1989 as an incentive to retain pilots. Two primary causes for low retention; quality-of-life issues such as deployments and appeal of commercial aviation. AF goal for retention has been 67%. Pre 9/11 airline hiring was booming and the traditional Bonus Take Rate (BTR) of 35% dropped to 30% in FY 2001. Post 9/11 the BTR have increased dramatically. (Source AF News)

-- Historical retention rates by CYOS for pilots are more stable than the yearly changes. Therefore these historical averages will be used for the retention/inventory portion of the model. (Provided by 1Lt. Damon Richardson, AFPC/DPAFFA)

-- Historical retention averages for fighter pilots have been slightly higher than for the general AF pilot population. (Source 2)

Literature Review

- Requirements:
  - Divided into 4 categories
    - Force requirements (operational fighters)
    - Training requirements (manning of UFT/FTU)
    - Staff requirements
    - Man-year requirements (Other/IDE/B-course)
  - Manning Levels needed for absorption affect actual “requirements”

-- The AF divides its pilots into four basic categories.

-- Force is comprised of combat pilots assigned to MWS cockpits. Force is further broken down into primary and support. The primary force is the “go to war” operational force. It includes the baseline fighters; F-15, F-16, A-10, and the parasite weapon systems; F-117, F/A-22, and UAVs. The support force includes the pilots in leadership positions such as squadron commanders and operation officers, and also Operational Test and Evaluation squadrons.

-- Training includes all pilots that are instructors for formal training. These include pilot instructors for UFT (T-37/T-38), IFF, and FTU.

-- Staff includes non-flying billets that require fighter pilot experience.

-- Man-year is the “other” category that includes all other fighter pilots. This includes PME and pilots in formal flying training. This category also accounts for all of the student pilots in the pipeline during their training to become fighter pilots. (Source 2)

-- Actual requirements effectively increase when operational squadrons are manned at levels above 100% to account for increased inexperienced pilot absorption. This situation has occurred recently in many AF operational fighter squadrons. (Source 2,7)

Literature Review

- Requirements:
  - AFPC fills with the following priority:
    - Operational Cockpits
    - Other MWS Cockpits
    - Training Cockpits
    - Remotes
    - ALO
    - Joint Staff
    - Other Staff
  - UAV's = other MWS cockpits

-- AFPC has a set of priorities when filling fighter pilot requirements. The highest priority is given to operational "go to war" billets. (Source 7)

-- Non-flying Staff is last to be filled, and has traditionally been the "shock absorber" for filling requirements.

-- In recent history, with the fighter pilot shortage, the staff billets are always manned below 100%. (Source 7)

-- Staff assignments are considered to be important in career and Total Force development. A lack of staff opportunities for pilots is detrimental for multiple reasons. The pilots lose career broadening opportunities. The AF loses the war-fighter's insight and experience in key planning and decision-making organizations.

Literature Review

- Requirements:
  - "Healthy" Operational Squadrons require:
    - $\geq$ 50% experience level
    - Manning = 100%
    - Provides max absorption with max readiness
  - AF definition for Experience Level assumes 100% manning
    - Over-manning skews true experience level

-- Based on RAND's study of fighter pilot absorption. The 40% experience goal is too low to keep a squadron "healthy" for the long-run. (Source 2)

-- "Healthy" is defined as 100% Combat Mission Ready (CMR) for all qualified RPI-1 pilots. Basically, all pilots must have access to the required number of training sorties per month in order to maintain qualification. Inexperienced pilots can only fly in certain sorties and in certain formation positions. Therefore they have access to fewer sorties. High levels of inexperienced pilots (>50%) prohibits them from receiving required training.

-- If experience goes below 50%, there are more inexperienced pilots too train with the same number of sorties available. Pilots reach experience at a slower rate and training backlogs occur.

-- If manning goes above 100%, once again there are fewer sorties for inexperienced pilots. Additionally, there are not enough sorties to keep all of the rated position indicator one (RPI-1) pilots in CMR Status. This adds to the training backlog.

-- The combination of the two problems is a situation that can't be maintained in the long term. The problems compound, leading to lower levels of experience and higher manning – basically spiraling out of control unless outside action is taken (ie. stop the flow of inbound pilots).

-- AF Definition of experience = $\frac{\text{Total RPI-1 Experienced Pilots}}{\text{Total RPI-1 Authorizations}}$

Literature Review

- Future Requirements
  - Force Changes
    - Future AF fighter requirements in flux
    - F/A-22 Buy, F-35 Program, F-117 BRAC
    - UAV squadrons to increase dramatically
  - BRAC Recommendations Included

-- Future fighter pilot requirements are questionable due to force shaping and BRAC.

-- Force changes: Upgrades to the AF fighter fleet are around the corner and final number of cockpits for F/A-22 and F-35 aircraft are constantly in flux.

-- UAV requirements are on the way. Due to huge success and high demand for UAVs, then number of active duty squadrons are slated to increase by 2 to 3 within the next 10 years. Each squadron contains 40 pilots, of which 45% are fighter aircrew. A UAV specific pipeline is in the works, but predicted not to help fill requirements for at least 10 years. Until then, fighter pilots will have to account for a portion of this increase in requirements. (Source 7)

-- BRAC Recommendations are included in the model based on the force changes defined in an ACC brief titled “State-by-State Installation View”.

Intent

- Build a model that can provide insight to all proposed questions
  - Ten year horizon
  - Model should be user-friendly for AFPC personnel to frequently update as information changes
- Model of Fighter Pilot System only
  - Training pipeline not included
  - Pilots enter the system post-FTU
  - Deterministic with yearly snap-shot out to 2015
- Compare inventory and requirements to figure out staff levels
  - Accurately models AFPC's rules for assigning fighter pilots
- Microsoft Excel chosen for "usability"

-- Model will account for Fighter Pilots only, post-FTU. The inventory can then be looked at as a system, based on production, operational manning, requirements, and retention as the variables. WSO's obviously affect certain platform manning (e.g. F-15E) as well as fighter staff manning, however the intent is to bound the problem in order focus on pilot specific issues. By looking at post-FTU production, the focus can be actual fighter pilot manning rather than pipeline-related issues.

-- Each sub-question is modeled as an equation or input to the overall model. The inputs and equations are linked to come up with a total requirement for fighter pilots.

-- The inventory is modeled separately, but linked by production levels.

-- Overall requirements can then be compared to overall inventory as a way to find out how many pilots are available for staff jobs. This modeling method most closely resembles AFPC's rules and procedures for assigning fighter pilots.

-- Excel provides user-friendly platform for inputting data and model maintainability that can provide decision-makers with appropriate information.

Methodology

- Output for sub-question #1: How will fighter squadron experience levels be affected?
  - Experience Levels are managed by Fighter Assignment Officers, therefore are not directly affected by increase in requirements
  - Experience Level set as input to model
  - Measure Effective Experience

$$\text{Effective Experience} = \frac{\text{Total RPI-1 Experienced Pilots}}{\text{Total RPI-1 Manning}}$$

-- Research showed that experience levels are managed by AFPC Fighter Assignments Officers. Therefore, experience level is best modeled as an input.

-- However, due to the actual Air Force definition of experience level, the “effective experience level” will differ from the actual experience level if the manning level is not 100%. The effective experience must be calculated because it affects the TTE (Time-to-Experience) for inexperienced pilots.

Methodology

- Output for sub-question #2: How will fighter squadron manning levels be affected?
  - Factors:
    - Required Experience Level
    - Time-to-Experience for Inexperienced pilots
  - Model: Required # of experienced pilots plus all inexperienced pilots

$$\text{Manning} = \frac{\text{Total Experienced Pilots (RPI-1 + RPI-6)} + \text{Total Inexperienced Pilots}}{\text{Total Authorizations}}$$

-- All inbound pilots are initially RPI-1 pilots upon arrival to their assignment (assumption).

-- RPI-1 pilots are those pilots who are assigned to the operational squadrons. They are required to be Combat Mission Ready (CMR).

-- RPI-6 pilots are those pilots assigned to leadership and supporting staff positions in the operational wings. RPI-6 pilots are required to maintain Basic Mission Capable (BMC) status. Generally, all pilots that are assigned to RPI-6 billets are already experienced, based on the job requirements and the fact that BMC status requires fewer sorties per month.

-- Non-operational pilots are those pilots assigned to non-operational MWS squadrons such as Test squadrons and the Weapon's School. These pilots are basically equivalent to RPI-6 pilots, however are counted separately since they are not a part of operational manning.

Methodology

$$\text{Manning} = \frac{\text{Total Experienced Pilots (RPI-1 + RPI-6)} + \text{Total Inexperienced Pilots}}{\text{Total Authorizations}}$$

- Total Experienced Pilots:
  - Total RPI-6 Authorizations
  - Required RPI-1 Authorizations to meet required experience level (50% experience level = 50% RPI-1 authorizations)
- Total Inexperienced Pilots:
  - This year FAIP & Pipeline entries
  - Last year Pipeline Entries
  - Portion of last year FAIP entries (based on TTE)
  - Portion of Pipeline Entries from 2 years ago (based on TTE)

Breakdown of Manning Equation:

-- The total number of experienced pilots is the sum of:

- All RPI-6 Authorizations (since all are experienced)
- Portion of RPI-1 authorizations to meet required experience level (since experience level is based on authorizations)

-- The total number of inexperienced pilots is the sum of:

- Pipeline and FAIP entries from this year (all still inexperienced)
- Last year's pipeline entries (all still inexperienced)
- Portion of last year's FAIP entries (since FAIPs will reach experienced status during their second year in an ops squadron)
- Portion of Pipeline Entries from two years ago (since pipeline pilots will reach experienced status during their third year in an ops squadron)
- The exact portion is a function of time-to-experience (TTE), which varies based on effective experience level and previous year's manning level

-- This calculation will be slightly inaccurate for years where the number of FAIP and Pipeline entries has changed. However, the significance is slight and can be ignored for this model.

Methodology

- Output for sub-question #3: How will fighter staff manning be impacted?
  - Final calculation since staff is “shock absorber”
  - “Requirements” are total authorizations plus extra manning required in operational squadrons to meet required experience levels

Fighter Staff Manning = Inventory - Other "Requirements"

-- Based on actual AFPC policies for assigning fighter pilots, fighter staff levels vary based on flying requirements. Therefore it is appropriate to model staff levels by comparing the total fighter pilot inventory to the total non-staff “requirements”. The “requirements” are the total authorizations plus extra manning (above 100%) in operational squadrons to reach required experience levels.

-- For this model, staff level is the final output. If the subsequent staff manning level is inappropriate (below absolute minimum requirements), then it can be deduced that the total fighter pilot inventory does not meet AF requirements.

Methodology

- Output for sub-question #4: Can the current increase of fighter pilots attending IDE be sustained?
  - IDE Level is an input
  - Sustainability Directly Related to Staff Manning

-- Assuming AFPC policy does not change towards IDE for fighter pilots, it is appropriate to consider IDE levels to be an input to the model. IDE is never denied to qualified fighter pilots based on manning levels. Therefore, IDE/SDE will be a constant after the AFIT ramp-up is complete in 2007.

-- Since IDE is an input, the sustainability of the increased IDE level is directly related to staff manning. If the staff manning is too low, IDE is one area that can be "blamed."

Methodology

- Output: Can current fighter production support increase in UAV requirements?
  - Also an input
  - Also Directly Related to Staff Manning

-- For this model, all UAV tours are 3 years (assumption). Any pilots who decide to stay in UAV's and not return to fighters are considered in the retention model – they basically leave the inventory. Therefore, the only UAV slots used in the input for this model are the initial UAV slots for fighter pilots per year.

Methodology

- Output: What is the impact on training requirements?
  - Man-Year Calculation
    - Portion of pilots in training at any given time
    - Based on length of training (portion of a year)
      - 20% of TX Slots
      - 16% of ALO training slots - Constant
      - 25% of PIT training slots - Constant
      - 25% of UAV training slots
    - Currently, man-year factor is 115

-- Based on the assumption that the number of fighter pilot training cockpits will remain constant, the only affect on training requirements is in the man-year category.

-- Man-year is a factor that accounts for all existing fighter pilots attending formal training courses as a student at any given time.

-- Weapons School students are not counted in this calculation. They are accounted for in the non-operational or RPI-6 billets.

Underlying Assumptions

- Fighter pilot retention is independent of assignments
  - Can be modeled separately
- Retention will follow historical averages
  - Historical pilot retention rates by CYOS
- Fighter Assignment Officers will keep manning levels at or above 100% in Operational Cockpits and they will manage experience levels to keep them as high as possible
  - Experience level is an input
  - Manning Level is an output
- FAIPs will only make-up 25% of new fighter pilots due to UPT limitations (experience level of UPT instructors)
- Total fighter pilot staff authorizations are 690

-- Independence assumption valid if taking the "big picture" view of the fighter pilot pipeline. Certain pilots will leave active duty based on the assignment that they are currently in. However, the historical averages for retention based on calendar years of service do not account for specific jobs. So overall, the historical averages include all jobs, since it is an average of all pilots in all jobs that have a specific number of years of service. Therefore an independence assumption is valid when looking at the inventory as a whole.

-- Historical averages dampen the near term-effect of changes in bonus, pilot training commitment, or the economy. This is acceptable for a ten year horizon. It will be assumed that the increased post-9/11 retention will not continue for the model horizon.

-- Based on the actual procedures for filling fighter assignments, the assumption of $\geq$ 100% manning is valid. Manning may need to be higher than 100% to reach a specific experience level.

-- Increasing the amount of previous FAIP fighter pilots produced will help experience levels (since these pilots become experienced quicker). However, pilot training bases need experienced fighter pilots as well as FAIPs in order to properly train student pilots. Therefore it will be assumed that the current percentage of previous FAIP fighter pilot production (25%) is the maximum acceptable level, and will remain at that level for the time-horizon of the model.

-- The total number of fighter pilots on the staff will vary based on entitlements and the number of fighter WSO's on the staff. However, 690 authorizations is based on an AFPC briefing concerning the location of current fighter pilots. This number will be the starting point for analysis.

Baseline Model Assumptions

- Fighter Pilot Production
  - New Fighter Pilots enter the system with the following distribution for completed CYOS:
    - Pipeline (75% of incoming fighter pilots)
      - 2 CYOS = 33% (100 of 300)
      - 3 CYOS = 33% (100 of 300)
      - 4 CYOS = 8% (25 of 300)
    - FAIPS (25% of incoming fighter pilots)
      - 5 CYOS = 3% (9 of 300)
      - 6 CYOS = 11% (33 of 300)
      - 7 CYOS = 11% (33 of 300)

-- The assumptions for fighter pilot production are as follows:

-- Yearly production of fighter pilots remains constant for the next ten years (300 per year).

-- Pilots enter the Fighter Pilot Inventory after 2 to 7 Calendar Years of Service, with the above percentages.

Baseline Model Assumptions

- Fighter Pilot Production
  - Time-to-Experience (post FTU)
    - Pipeline Pilot
      - F-15C, F-16, F/A-22 = 2 years & 6 months
      - A-10, F-15E = 2 years & 3 months
    - FAIP
      - F-15C, F-16, F/A-22 = 1 year & 4 months
      - A-10, F-15E = 1 year & 3 months
  - Equates to 15/16 flying hours per month
  - Assumes a baseline of 100% manning / 50% Experience

-- Pipeline Pilots require 500 hours in their MWS to become experienced

-- FAIPs require 300 hours in their MWS to become experienced

Time-to-Experience (TTE) Assumptions:

-- All pilots will get 60 flying hours during FTU.

-- All F-15C, F-16, and F/A-22 inexperienced pilots will get 15 flying hours per month in their operational unit. FAIPs will become experienced in 1 years and 4 months. Pipeline pilots will become experienced in 2 years and 6 months.

-- All F-15E and A-10 inexperienced pilots will get 16 hours per month. FAIPs will become experienced in 1 years and 3 months. Pipeline pilots will become experienced in 2 years and 3 months.

-- These numbers are only valid for experience levels of 50% and manning levels of 100%.

-- Time to Experience will increase linearly for manning levels above 100% or experience levels below 50%.

-- FAIP TTE increases by 1 month for every 10% increase in manning level or 10% decrease in experience level.

-- Pipeline pilot TTE increases by 1.5 months for every 10% increase in manning level or 10% in experience level.

Baseline Model Assumptions

- Requirements - Flying Billets
  - All RPI-6 pilots, RTU instructor pilots, W-prefix, and test pilots are experienced
  - All RPI-6 billets will be filled at exactly 100%. RPI-1 billets can be filled at $\geq$ 100% to manage experience levels
  - All non-operational MWS cockpits will be filled at exactly 100% manning level

-- RPI-6 Billets are filled by experienced pilots in this model. All inexperienced pilots are in RPI-1 status.

-- The only variable to MWS manning in the model is the operational RPI-1 manning (due to experience level variability). All RPI-6 and non-operational cockpits are manned at 100% of authorizations.

Baseline Model Assumptions

- Requirements - BRAC as advertised
  - Phase-out from 2009-2011
    - Langley keeps one F-15C Squadron open
  - Calculation of RPI-1/6 authorization change based on wing closures or PAA
  - F-117 is retired by 2011
  - F/A-22 phased-in according to timeline briefed to AFPC with slip for current status
    - Build-up to BRAC PAA level

-- The requirements are modeled exactly like the BRAC drawdown, with one exception: Langley keeps one F-15C squadron open instead of closing it in 2007 and then opening back up when BRAC changes take effect. Based on experience, it would save money to keep the squadron open rather than closing it, relocating aircraft, and then bringing aircraft back. Therefore, the assumption is that this squadron will stay open.

-- All BRAC changes take place proportionally between 2009 and 2011

-- The calculation of changes in PAA is based primarily on the reduction of authorizations from wings that closed. Additionally the overall PAA of the airframe is considered, and kept proportional to current conditions.

-- All of the requirements are left as inputs, rather than “hard-wired” into the model. Therefore they can be changed as more information becomes available.

F-16 Input

INPUT	Current	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Operational Authorizations	699	699	699	699	646	593	540	540	540	540	540
RPI-1 Sub-Total	538	538	538	538	497	456	416	416	416	416	416
TX Slots	86	86	86	86	81	76	71	71	71	71	71
B-Course New Pilots	100	100	100	100	92	85	78	78	78	78	78
B-Course FAIPS	32	32	32	32	29	27	25	25	25	25	25
Total RPI-1 Experienced Pilots	430										
Total Operational Manning	704										
Required Operational Experience Level	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total Non-Operational Authorizations	258	258	258	258	241	213	206	206	206	206	206

F-16:

-- BRAC takes away 90 Operational PAA / 48 FTU PAA = 159 / 60 authorizations

-- Gives a 23% decrease in Operational Authorizations & 34% decrease in FTU auth.

-- Associated FTU production decreases (assumed that ANG/AFRES picks up some slack):

-22% decrease from current levels

-B Course: 132 to 103

-TX Course: 86 to 67

-- BRAC adds 5 Non-operational PAA at Nellis = 8 authorizations

F-15C Input

INPUT	Current	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Operational Authorizations	361	344	327	327	291	255	219	219	219	219	219
RPI-1 Sub-Total	278	265	252	252	224	196	169	169	169	169	169
TX Slots	45	45	45	45	41	36	31	31	31	31	31
B-Course New Pilots	56	45	45	45	40	35	30	30	30	30	30
B-Course FAIPS	18	15	15	15	14	13	11	11	11	11	11
Total RPI-1 Experienced Pilots	136										
Total RPI-1 Operational Manning	367										
Required Operational Experience Level	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total Non-Operational Authorizations	99	99	99	99	99	99	103	103	103	103	103

F-15C:

-- BRAC takes away 90 Operational PAA / 13 FTU PAA = 142 / 20 authorizations

-- Gives a 39% decrease in Operational Authorizations & 31% decrease in FTU auth.

-- Associated FTU production decreases:

-32% decrease from current levels

-B Course: 60 to 41

-TX Course: 45 to 31

-- 24 PAA go away with Langley Phase out (one Eagle squadron stays open)

-- B-Course / TX course production continues at same rate until BRAC timeline

-- 66 PAA go away according to BRAC timeline

-- BRAC adds 18 Non-Operational PAA at Nellis = 24 authorizations

F-15E Input

INPUT	Current	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Operational Authorizations	212	212	212	212	212	212	212	212	212	212	212
RPI-1 Sub-Total	163	163	163	163	163	163	163	163	163	163	163
TX Slots	20	20	20	20	20	20	20	20	20	20	20
B-Course New Pilots	33	33	33	33	33	33	33	33	33	33	33
B-Course FAIPS	10	10	10	10	10	10	10	10	10	10	10
Total RPI-1 Experienced Pilots	148										
Total Operational Manning	216										
Required Operational Experience Level	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total Non-Operational Authorizations	82	82	82	82	82	82	82	82	82	82	82

F-15E:

-- No change in authorizations

A-10 Input

INPUT	Current	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Operational Authorizations	251	251	251	251	251	251	243	243	243	243	243
RPI-1 Sub-Total	193	193	193	193	193	193	187	187	187	187	187
TX Slots	32	32	32	32	32	32	32	32	32	32	32
B-Course New Pilots	43	43	43	43	43	41	41	41	41	41	41
B-Course FAIPS	12	12	12	12	12	10	10	10	10	10	10
Total RPI-1 Experienced Pilots	187										
Total RPI-1 Operational Manning	255										
Required Operational Experience Level	0.67	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total Non-Operational Authorizations	76	76	76	76	76	76	76	76	76	76	76

A-10:

-- BRAC takes away 6 Operational PAA / 0 FTU PAA = 8 / 0 authorizations

-- Gives a 3% decrease in Operational Authorizations & no decrease in FTU auth.

-- FTU production decreases slightly for lower PAA (lower potential absorption capacity)

F/A-22 Input

INPUT	Current	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Operational Authorizations	20	47	94	120	140	187	234	281	304	327	327
RPI-1 Sub-Total	16	36	72	92	108	144	180	216	234	252	252
TX Slots	20	25	30	25	30	32	34	36	38	38	38
B-Course New Pilots	0	0	0	17	23	29	34	39	39	39	39
B-Course FAIPS	0	0	0	7	9	11	14	17	17	17	17
Total RPI-1 Experienced Pilots	20										
Total Operational Manning	20										
Required Operational Experience Level	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total Non-Operational Authorizations	20	30	40	50	60	70	80	90	90	90	90

1.5 Crew Ratio

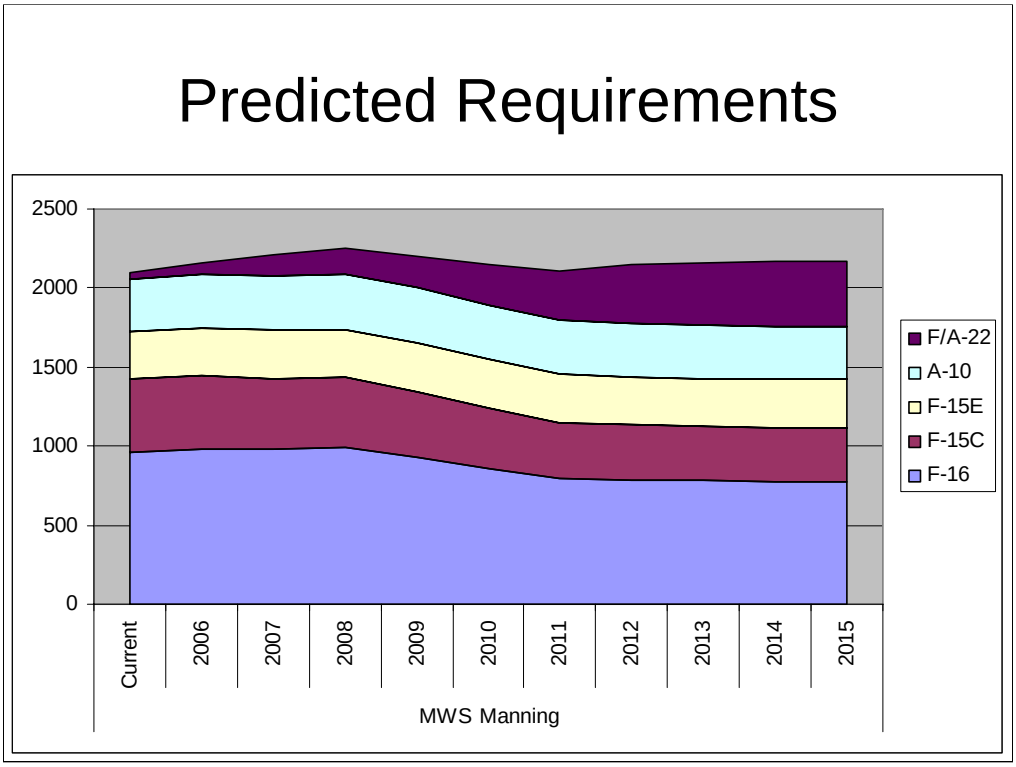
<u>F/A-22</u>:

-- Build-up to BRAC PAA

-- Timeline is approximate. These numbers could almost be considered an additional independent variable. However, for this analysis, these numbers will not vary.

-- Crew ratio is 1.5

-- Parasite until 2008, when pipeline phases in gradually.



-- The overall number of authorizations for MWS's with a production pipeline remains relatively stable over the next 10 years, assuming that the F/A-22 pipeline opens in 2008. Therefore maximum production of fighter pilots will not change significantly from year to year.

Baseline Model Assumptions

- UAV
  - Initially current rate – 36 fighter pilots per year
  - New Squadrons IOC in 2009, 2011, 2013
    - 40 pilots per squadron
    - Fighter Pilots continue to fill 45% of billets
    - Any WSO or Bomber fills are above 45% level
  - Yearly billets increase proportionally with increased “PUA” (Primary UAV Assigned)
  - UAV assignments are 3 years post training

-- Assumes that all CAF UAV authorizations go to fighter pilots

-- Based on the current UAV force structure, the steady state number of fighter pilots occupying UAV billets is 108. This figure is reached in 2008. However the expected increase force structure gradually increases the number of fighter pilots occupying UAV billets to 162 by 2014. This assumes that new UAV squadrons open up in 2009, 2011, and 2013.

-- All pilots return to their MWS after UAV assignment. Any fighter pilot that becomes a permanent UAV pilot is accounted for in the inventory/retention model.

Baseline Model Assumptions

- Test Pilot / Exchange
  - Yearly billets remain constant (86 / 40)
- White Jet IP / ALO
  - Yearly Billets remain constant (371 / 91)
  - All White jet assignments are 3 years
  - 66% of ALO billets replaced yearly (60)
- IDE/SDE – slight increase to steady-state
  - All slots are one year (189)

-- 66% of ALO billets replaced yearly to account for percentage of one year vs. two year billets.

-- IDE increase from current level due to continued ramp-up of IDE students at AFIT.

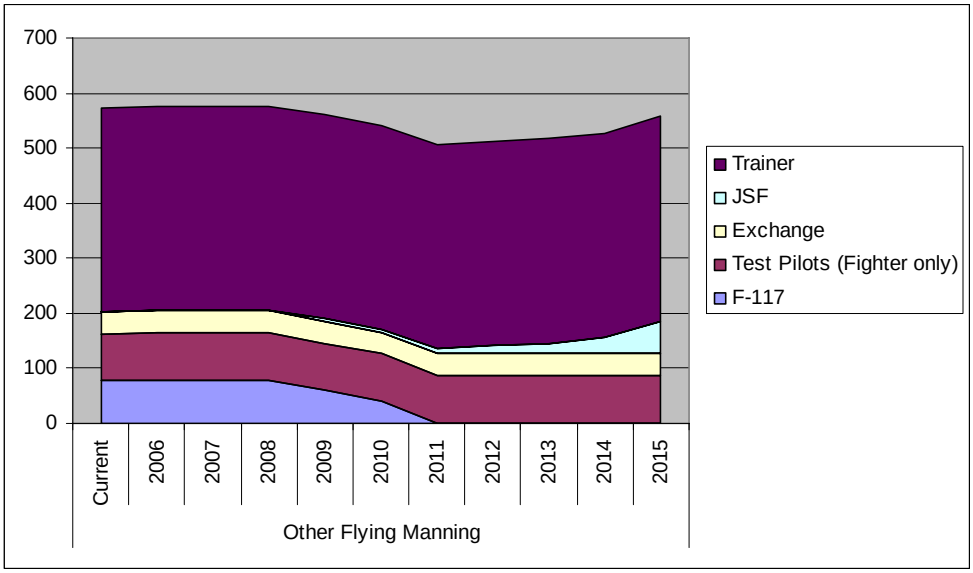
Non-Flying Input

Non-Flying Input	Current	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
UAV	39	62	85	108	112	120	132	146	156	162	162
ALO	91	91	91	91	91	91	91	91	91	91	91
IDE/SDE	171	180	189	189	189	189	189	189	189	189	189
Total	**301**	**333**	**365**	**388**	**392**	**400**	**412**	**426**	**436**	**442**	**442**

Other Flying Input

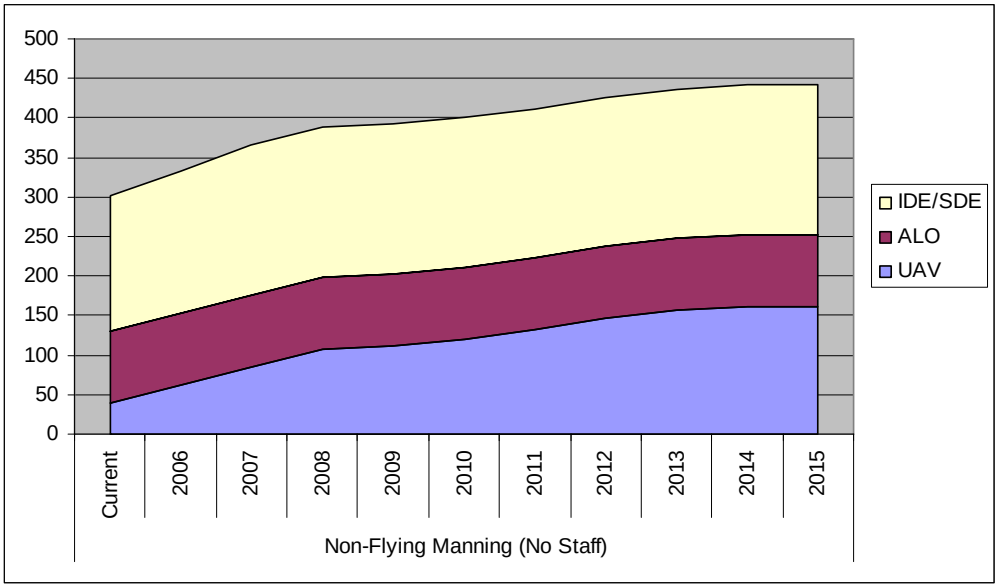
Other Flying Input	Current	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
F-117	77	78	78	78	60	40	0	0	0	0	0
Test Pilots (Fighter only)	86	86	86	86	86	86	86	86	86	86	86
Exchange	40	40	40	40	40	40	40	40	40	40	40
JSF	0	0	0	0	5	5	10	15	20	30	60
Trainer	371	371	371	371	371	371	371	371	371	371	371
Total	**574**	**575**	**575**	**575**	**562**	**542**	**507**	**512**	**517**	**527**	**557**

Predicted Requirements



-- This graph represents the parasite flying authorizations. There is a slight reduction after BRAC, with the F-117 retirement, but the F-35 will become a new parasite that could actually increase overall requirements for a period.

Predicted Requirements



-- The non-flying manning has the largest increase in requirements due to the increase in UAV's and IDE.

Inventory Model Modifications

- Baseline - 300 pilots produced per year retention follows historical averages
- Mod 1 – Pilot production will equal actual capacity per year, retention unchanged
- Mod 2 – Pilot production equals capacity, retention values shifted for 10 year pilot training commitment
- Mod 3 – Pilot production equals capacity, shifted retention values lowered 10% for years 11-14

-- The inventory model was modified to more closely resemble current conditions.

-- 300 pilots per year is not necessarily possible each year. Max production based on infrastructure is more exact. Mod 1 uses actual predicted production capacity.

-- Historical averages for pilot production don't take into account the increase pilot training commitment (changed from 8 to 10 years in 1997). Therefore mod 2 shifts the values to account for the two year increase in commitment.

-- Based on history, the possibility exists for a swing towards lower retention due to external factors. Mod 3 lowers the retention values for years 11-14 by ten percent to simulate a period of lower retention. The years immediately following pilot training commitment have a large variance in their retention averages, therefore this is the most likely period for a lower retention.

Modifications to Baseline

- Mod 1 = Production linked to capacity instead of constant 300 pilots/year
  - Results in only a slight change in total production
  - 2008 Increase: F/A-22 pipeline opens before BRAC reductions

Current	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
304	290	290	314	305	294	286	294	294	294	294

-- Maximum production is relatively stable. F/A-22 spin-up compensates for the BRAC reductions.

Modifications to Baseline

- Mod 2
  - Production Linked to Capacity (Mod 1)
  - Retention Values adjusted for years 8-14 to account for 10 year pilot training commitment

CYOS	Old Mean	New Mean
8	0.988	0.995
9	0.894	0.995
10	0.837	0.980
11	0.912	0.912
12	0.934	0.890
13	0.945	0.830
14	0.779	0.850

-- Pilot training commitment was increased in 1997 from 8 years to 10 years. These new mean retention values should begin taking effect in 2005 for those pilots with 8 and 9 CYOS (corresponding to those pilots who finished pilot training with 1 or 2 CYOS in 1998). The adjusted values are gradually "stepped" into the retention model as the 1998 pilot training graduates move from 8 to 14 CYOS.

Modifications to Baseline

- Mod 3
  - Production Linked to Capacity (Mod 1)
  - Retention Values adjusted for years 8-14 (Mod 2)
  - Retention lowered 10% each for years 11-14 to model a “worst-case” retention
  - 10% Reductions are within 2 Standard Deviations of the Mean Retention for each year

CYOS	Mod 2 Mean	Mod 3 Mean
11	0.912	0.812
12	0.890	0.790
13	0.830	0.730
14	0.850	0.750

-- Mod 3 combines the changes of Mod 1 and Mod 2 with a realistic, “worst-case” scenario for retention. The retention values for the 4 critical years after pilot training commitment ends are reduced by 10%. The reductions for years 11 and 12 are 1 standard deviation lower than the retention mean for years 9 and 10 of the current historical data (which are the corresponding years given the 2 year increase in pilot training commitment). The reduction for year 13 is 2 standard deviations lower than the retention mean for year 11 of the current historical data. The reduction for year 14 is 1 standard deviation lower than the retention mean for year 14 of the current historical data (assuming that years of service is the more dominant factor for pilots in their 14th year of service).

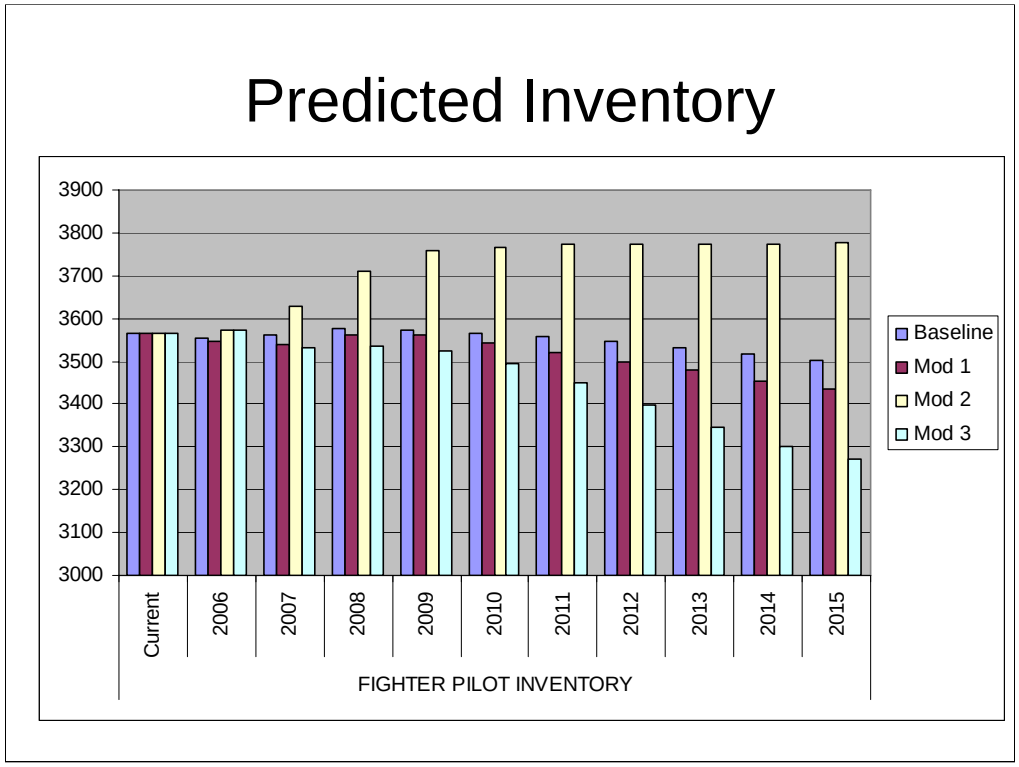
Starting Conditions

- Numbers for current pilots in each position comes from:
  - January 05 data pull of F-15C, F-16, F-15E, and A-10 pilots
  - AFPC Briefing on location of current fighter pilots
  - Correspondence with Fighter Assignments Officers

Model Output

- Predicted Inventory
- Predicted Requirements & “Requirements”
- The Difference = Staff Manning
- Maximum / Reduced Production
- Flying Hour Cut
- Answer to Sub-questions

-- The output will be analyzed as listed.



-- Graph shows the fighter pilot inventory per year through 2015 for the Baseline Model, along with Mods 1,2, and 3.

-- The current inventory is 3564 fighter pilots. Mod 2 shows the greatest increase in inventory with 3776 fighter pilots by 2015. Mod 3 show the greatest decrease in inventory with 3271 fighter pilots by 2015. The difference, 505 fighter pilots, is almost exactly the number of fighter pilots currently in staff jobs. Retention is a critical factor for future fighter pilot manning.

-- For Mod 2, the greatest increase in inventory occurs in the next four years as the higher retention rates for fighter pilots kick in based on the increased pilot training commitment. This makes sense intuitively since no pilots will reach the end of their initial pilot training commitment in CY06 and CY07. Basically, the inventory increases because fewer pilots are eligible to leave active duty service.

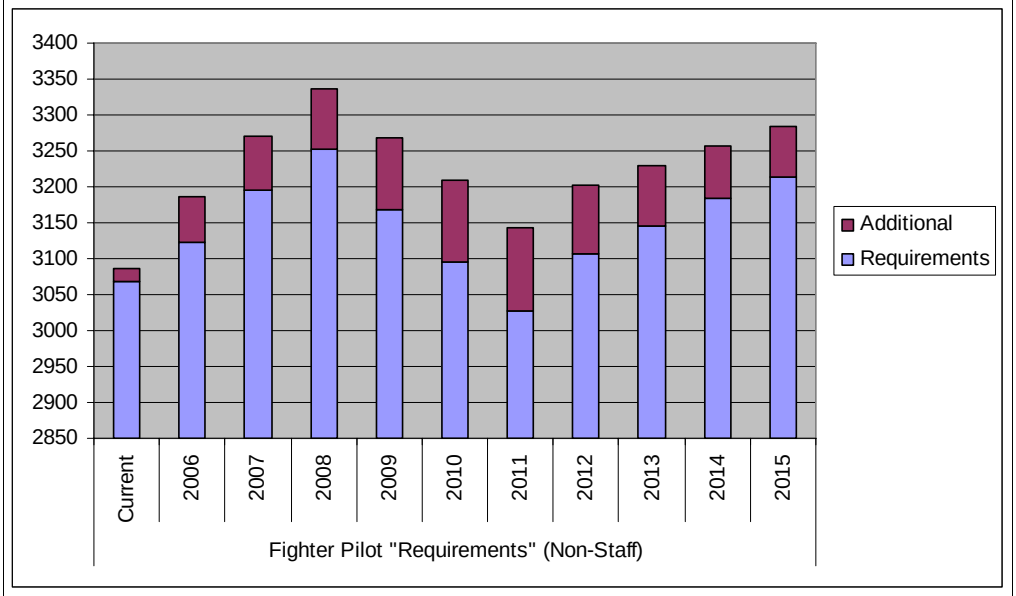
-- For Mod 3, the inventory is stable for the next few years because the decreased retention rates are offset by the lower number of pilots eligible to get out. Starting in 2010, however, the lower retention rates dominate, and the inventory decreases significantly through 2015.

-- RAND's study, Absorbing Air Force Fighter Pilots, predicted a steady state of 3753 fighter pilots given a yearly production of 330 fighter pilots. (Source 3)

-- Based on the assumptions, and current events Mod 2 and Mod 3 appear to be realistic upper and lower bounds on the fighter pilot inventory for the next 10 years. Production is currently at maximum capacity and the pilot bonus options have been cut recently (possibly due to the overall over-manning in the Air Force at large), therefore it is unrealistic for the fighter pilot inventory to be higher than the levels of Mod 2. The reduction in retention rates introduced in Mod 3 is substantial and probably not likely in the long run. However, based on external factors such as the economy, these reduced rates are realistic over a short term period. Therefore, Mod 3 is a solid lower bound on the inventory.

-- Mod 2 and Mod 3 will be used as the upper bound and lower bound, respectively, on fighter pilot inventory for the remaining analysis.

Predicted “Requirements”



-- This graph shows all of the manning authorizations filled at 100%, based on the assumptions, plus the additional operational manning required to absorb inexperienced pilots at the predicted production rate.

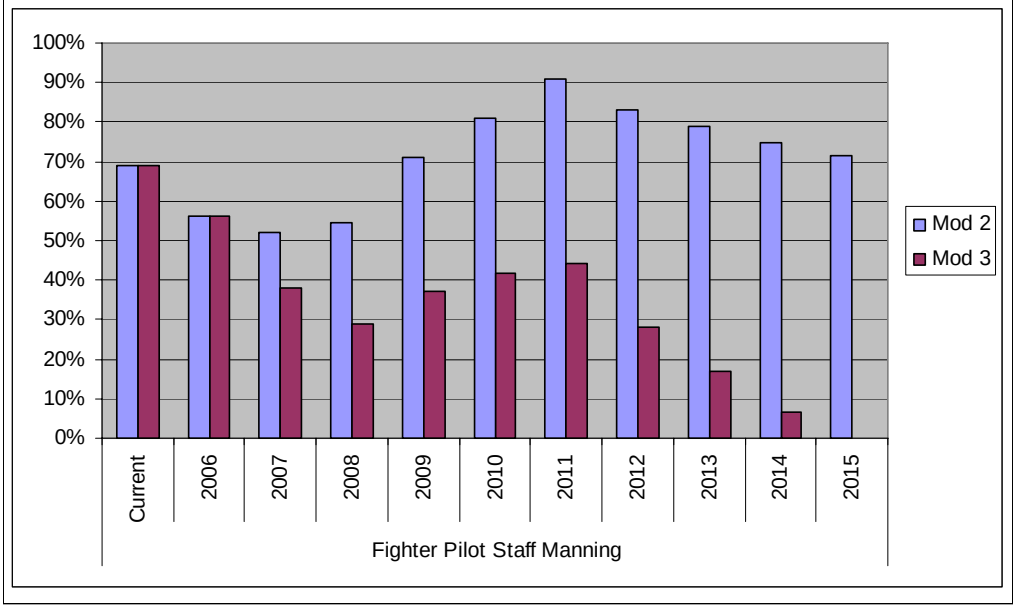
-- Near term increase (2006-2008) due to increase in IDE, UAVs, and F/A-22 ramp-up

-- Decrease during 2009-2011 due to BRAC

-- Increase from 2012-2015 due to continued F/A-22 ramp-up and start of the F-35 ramp-up.

-- Overall requirements relatively stable (between 3068 and 3213). Absorption requirements add up to 4% (116 additional fighter pilots in 2011) to the total.

Staff Level



-- This Graph shows the fighter pilot staff manning levels given high and low retention (the Mod 2 and Mod 3 inventory models). This graph assumes that all fighter pilots in the inventory above the "requirements" fill fighter pilot staff jobs.

-- The curve is sinusoidal based on requirement variations already discussed.

-- With high retention, the staff level dips over 15% in the next two years, but then increases and stays above current levels.

-- With low retention, the staff manning eventually decreases to zero by 2015.

Maximum Production

- With maximum production, staff manning is completely dependent on retention; however:
  - Effective experience levels in the operational squadrons are low:
    - F-16: 44-48%
    - F-15C: 35-41%
    - F-15E: 42-44%
    - A-10: 45-46%
  - Steady-state condition of “unhealthy” operational squadrons
    - Readiness issue
- Increased UAV requirement (+123 by 2015) is not a significant factor

-- The staff manning is completely dependent on retention if maximum fighter pilot production is continued. However, continued maximum production will lead to low effective experience levels in the primary fighter MWS’s. Additionally, operational manning will be consistently high (105%-110%). Based on history, this type of situation will lead to “unhealthy” operational squadrons. Training Backlogs will likely occur, and there will not be enough sorties to keep all RPI-1 pilots qualified as CMR. Even if retention is high, readiness will still be an issue because of the excessive amounts of inexperienced pilots in the operational squadrons.

-- The only ways to resolve this situation is to increase flying hours or reduce fighter pilot production. Obviously the most likely choice is to reduce production.

-- Increased UAV requirements are not a significant factor. The increase (+123 by 2015) is about 3% of total fighter pilot requirements, and only represents 18% of total fighter pilot staff requirements.

Reduced Production

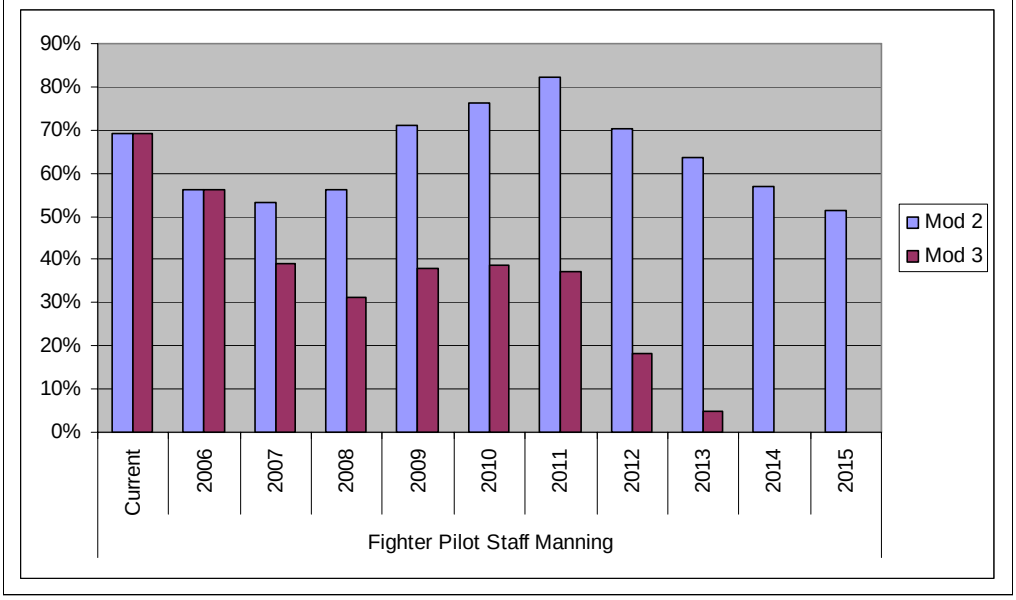
- Goal: Healthy operational squadrons
  - 100% manning, 50% experience level
- Requires an 8-11% cut in production

FIGHTER PILOT PRODUCTION

	Current	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Maximum	304	290	290	314	305	294	286	294	294	294	294
Reduced	304	290	254	278	277	270	262	271	271	271	271

-- In order to keep fighter squadrons healthy, production must be decreased by 8-11% each year. This reduction will have an affect on inventory.

Staff Levels with Reduced Production



-- The decrease in production hurts staff levels in the long run because of the associated decrease in overall fighter pilot inventory. Even with high retention, staff numbers will be below the current level by 2013. With low retention, the inventory fails to meet requirements by 2014, leaving the staff un-filled.

-- Production and retention are both critical to staff manning.

-- With high retention, staff manning in 2015 could stay right at today's level (69% manned instead of 51% manned) if no UAV requirement existed. However, the trend shows that staff levels would continue to decrease, and the elimination of a UAV requirement would not be a long-term solution to the fighter pilot shortage.

10% Flying Hour Cut

- Maximum production is not possible
  - By 2008 fighter squadron manning is > 117% in all fighters (up to 128% in F-15C)
  - Effective experience levels are 30-41%
- Production must be cut by 19-23% to keep operational squadrons healthy

FIGHTER PILOT PRODUCTION

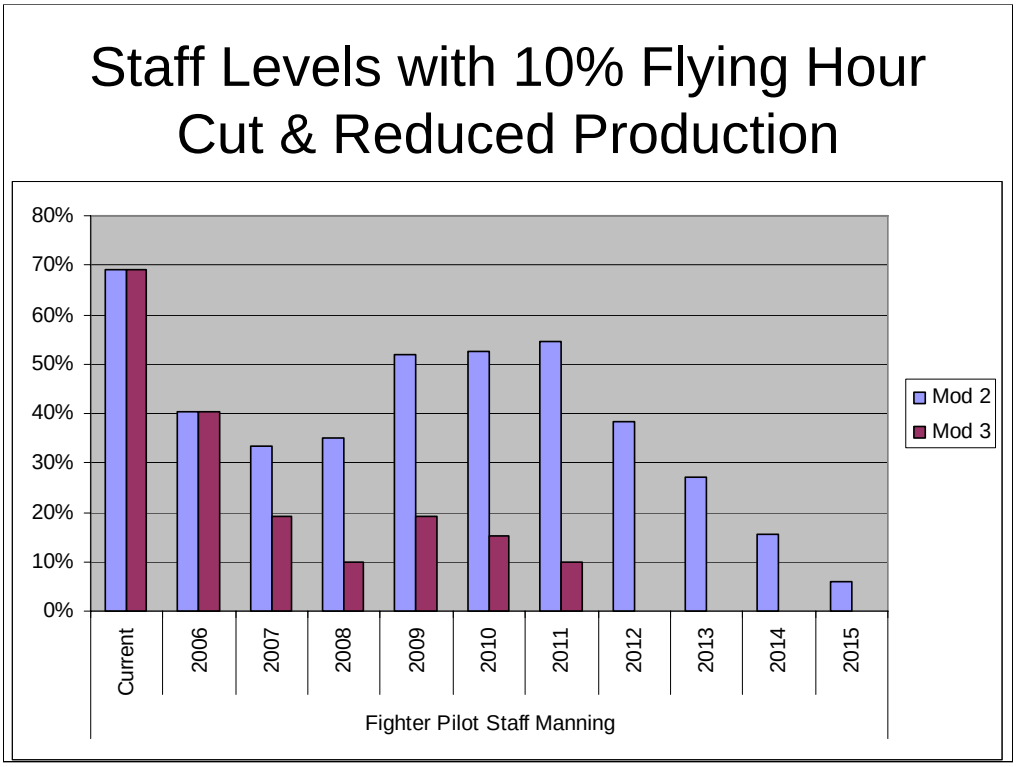
	Current	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Maximum	304	290	290	314	305	294	286	294	294	294	294
Reduced	304	290	220	241	236	230	224	228	232	236	236

-- Flying hour cuts are a possibility. The CAF is currently dealing with a large reduction in FY05 flying hours. Therefore the model was re-run with a ten percent flying hour cut.

-- Methodology: An overall 10% flying hour cut has a greater effect for inexperienced pilots. Therefore the baseline model was re-done with a 15% cut in inexperienced pilot's flying hours per month. TTE values were increased appropriately.

-- The results showed very "unhealthy" situations in operational squadrons. In F-15C's for example, effective experience levels were near 30%, while manning rose as high as 128%.

-- In order to correct for this problem, a production decrease of 19-23% per year across all airframes was required.



-- In order to keep operational squadrons healthy with a 10% flying hour cut, the decreased production levels lead to a situation where the fighter pilot staff is essentially unmanned by 2015, regardless of retention.

-- With low retention, there is a shortage of 417 fighter pilots for non-staff requirements by 2015.

Problem Statement

HOW WILL UAV GROWTH AFFECT FIGHTER PILOT MANNING?

- Not significantly (3% of requirements)
- Production must stay high
- Professionally it impacts fighter pilots
  - UAV slot equates to staff slot
- The problems facing the fighter pilot inventory are bigger than the UAV increase

-- The total predicted increase in UAV requirements only represents 3% of total fighter pilot requirements.

-- Fighter pilot production must stay high regardless of UAV requirements because of the current shortage of fighter pilots.

-- On an individual level, each UAV requirement equates to one less staff opportunity

-- An elimination of the UAV requirement could provide a “band-aid” to the fighter pilot inventory for a few years, but the current shortage of fighter pilots is larger than the UAV increase. The critical factors for fighter pilot inventory are production capacity and retention.

Research Questions

- How will fighter squadron **experience levels** be affected?
  - Experience Level is managed by AFPC
  - Effective Experience Level is low (35-47%) and requires reduced production (8-11%)
  - Effective Experience Level is critically low with flying hour cut (30-41%) and requires bigger reduction (19-23%)
  - Production, not UAV requirements, is the main factor

-- The bottom line is that production levels drive the effective experience in operational squadrons. Maximum production is required because of the over-arching fighter pilot shortage. Even an elimination of the UAV requirement would have no bearing on effective experience levels.

Research Questions

- How will fighter squadron **manning levels** be affected?
  - Manning driven by production levels
  - UAV requirements have no effect since production levels must stay high
  - Manning will be high unless production is reduced 8-11%.

-- This problem is directly related to the previous question.

Research Questions

- How will **fighter staff** manning be impacted?
  - UAV requirements directly relate to staff manning
  - Increase in requirements only represents 18% of total fighter staff authorization
  - Overall Staff manning more dependent on retention

-- Fighter staff manning will continue to be a shock absorber regardless of a UAV requirement. None of the models show fighter pilot staff manning ever reaching 100% of authorizations.

-- The increase in UAV requirements only account for 18% of fighter staff authorizations, so it alone can't solve the problem.

Research Questions

- Can the current increase of fighter pilots attending **IDE** be sustained?
  - The IDE increase is smaller than the predicted UAV increase
  - Bigger problem is production
  - IDE decrease would only be a band-aid

-- IDE takes more total slots than UAVs. However, the IDE plus-up represents only 2% of fighter pilot requirements. Once again the problem is production. Decreasing IDE can't solve the problem. Also, a decrease in IDE opportunities may have an indirect negative effect on retention, which is also a critical factor to the pilot shortage problem.

Research Questions

- Can current fighter pilot **production** support increase in UAV requirements?
  - Yes, continued maximum production can support all requirements, assuming good retention
  - This will lead to “unhealthy” operational fighter squadrons

Research Questions

- What is the impact on **training** requirements?
  - Man-Year Calculation would be the only impact
    - UAV increase does increase man-year calculation slightly
    - Reduction in TX requirements after BRAC compensates and keeps man-year factor stable

-- Man-year factor remains constant (UAV increase is offset by BRAC TX decrease).

Conclusions

- The increasing UAV requirement should not be the focus of any discussion about the fighter pilot shortage
  - Only 3% of fighter pilot requirements
- Production and Retention are critical
  - If current trends of higher retention can continue, production should be decreased by 8-11% to ensure health of operational squadrons
- A long-term cut in flying hours will break the system

Areas for Improvement / Continued Research

- Inventory Model – update retention values
- Requirements – AFPC expert for each category should scrub the future projections (especially F/A-22, F-35)
- Focus on production and absorption given a flying hour cut
  - Only feasible solution may be a change to the definition of experience

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14. ABSTRACT

Historically, managing fighter pilot requirements has been a continual challenge for the Air Force Personnel Center. In recent years, Unmanned Aerial Vehicles have become a highly sought after commodity, and the number of UAV billets have increased, with more increases expected in the near future. Currently 45% of UAV squadrons are manned by combat aircrew. Fighter pilots fills the majority of these slots. This dramatic increase in UAV requirements demands analysis for the impact on fighter pilot requirements. An increase in UAV fighter pilot billets represents a direct increase in force requirements, however, there may be an indirect effect on training and man year requirements.

15. SUBJECT TERMS
Fighter Pilot requirements, Unmanned Aerial Vehicle requirements, Pilot requirements

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