

Note from AFA President -- Why Numbers Matter -- Part 3

Friday, October 31, 2008

AFA Members, Congressional Staffers, Civic Leaders, and DOCA members, when AFA began the series on "Why numbers matter," many of you wrote to me asking for a scenario on tankers. So, what we have done (with a lot of help from many sources) is to adapt the scenario we used on fighters – helping to provide air defense of Saudi Arabia (circa 1990) – and asked the question: How many tankers would it take for the same scenario. For reference, you might glance back at the note on this subject:

<http://www.afa.org/PresidentsCorner/Notes/Notes-9-02-08.pdf>

The information below is presented for your information.

As always, I look forward to your comments.

Mike

Michael M. Dunn
President/CEO

Mission – Air Defense Refueling Support

Scenario: Defend Saudi Arabia from an Air Attack from Iraq – circa 1990

Number of Air Refueling Anchors required: 7 (4 to support USAF CAP, 1 to support Navy CAP, 2 to support Saudi CAP).

Number of Tankers per CAP: 1 KC-135

Number of Receivers per CAP: 8 F-15s

Assumptions:

- Air Refueling Station Time: 4 hours
- AR Anchors are located 2 hour from home station AR support required 24/7
- Tanker offload per AR: 80,000 lbs
- Required tanker fuel load: 177,000 lbs (offload + required fuel load)
- All tanker sorties are flown from one location
- Aircraft fly 2 sorties per day
- Mission capable rate is 85%

Question: How many aircraft do you need to conduct this mission?

Answer:

- 7 CAPS X 1 aircraft per CAP = 7 aircraft

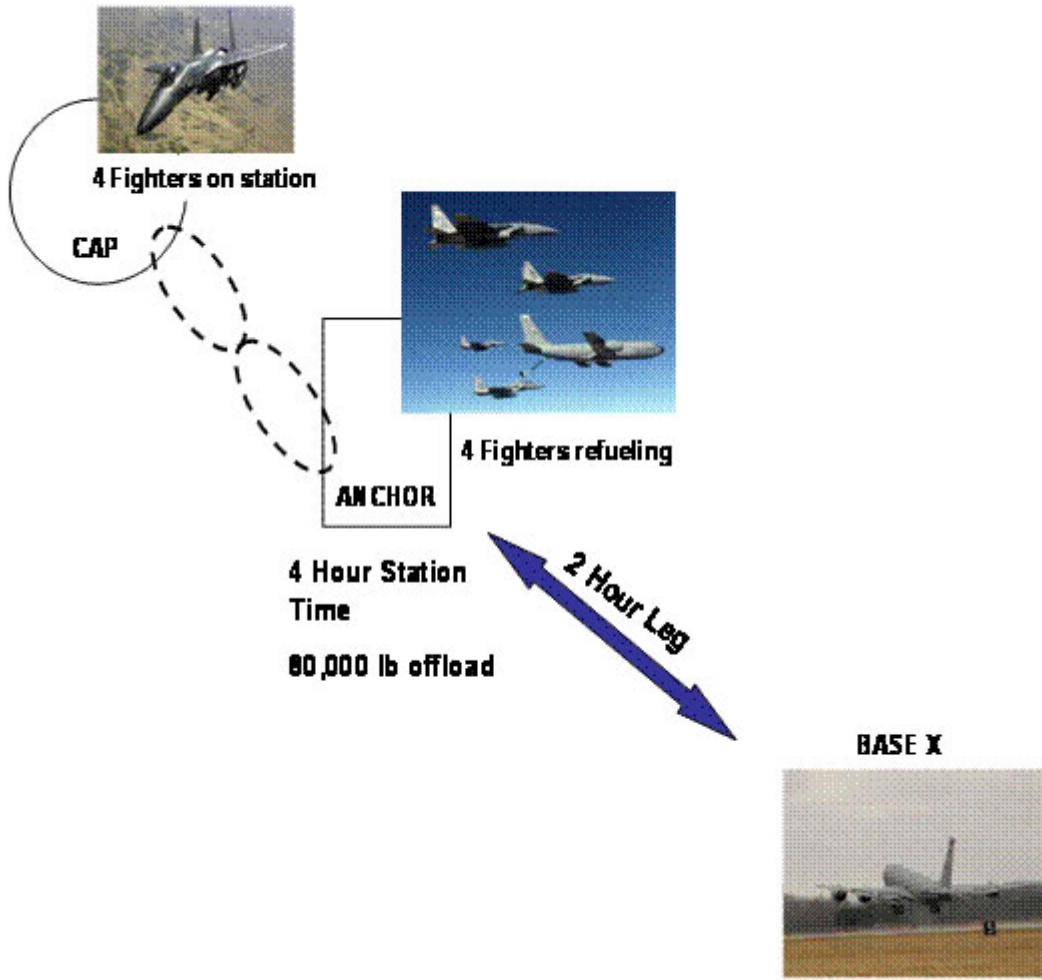
- 24 hour coverage requires 6 sorties per CAP (3 tankers per CAP – see charts)
- Aircraft from sortie 1 recycle to sortie 4; aircraft from sortie 2 recycle to sortie 5; sortie 3 recycles to sortie 6. Total number of tankers required: 21 (3 per cap X 7 caps) 2 ground spares per day increases total aircraft requirement to 23.
- Total tankers required to generate 23 aircraft: 27 (85% of 27 = 23)
- A certain number of tankers are held in the US for aircrew and maintenance training; a few will be in test. This brings the total number to 40.
- Some tankers will be in depot. This number has grown as the KC-135 has aged. Presently it is 24% for active duty aircraft => 53 aircraft required.
- Total offloads and timing prevent one tanker from covering more than one AR anchor
- If positioning/depositioning times increase due to airfield availability then fuel available to offload could decrease along with the ability to regenerate aircraft which would increase total aircraft requirements.

Comments:

- Receiver cycle times and offload requirements drive the number of tankers (booms) required. Current scenario requires 40 minutes of boom time for each flight of fighters. A second tanker will reduce cycle time but double tanker requirements.
- Tanker aircraft footprint makes basing them in large numbers challenging and can result in greater support requirements if tankers are spread across a number of airfields (i.e. additional maintenance manpower, support equipment and aircraft spare parts)
- Basing tankers closer to air refueling anchors gives tanker planners greater flexibility for mission planning
- This number (53) is only one small part of tanker requirements.
- Let's add to this problem:
 - AWACS, RC-135, JSTARS, and EC-130 refueling requirements = 6 tankers
 - Strike package refueling for the early days of a Desert Storm mission = 20 tankers plus 5 for recovery – per mission. If there are 10-15 strike packages per day, then the numbers go very high.
 - "Normal" sortie rates after an initial surge – 1.3 to one => 30% increase in the numbers
 - Air bridge for airlift aircraft => unknown number of tankers
- You quickly get to numbers of required aircraft that are very large.
- The KC-X will be air-refuelable (unlike the KC-135) ... easing the problem of tanker planners a bit.

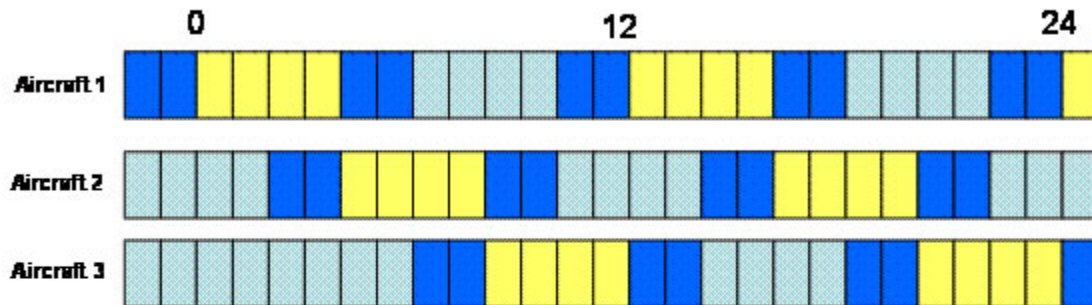
- Also easing the problem is the KC-X will be both boom and drogue capable. The KC-135 cannot refuel Navy aircraft if configured with a boom ... or vice versa with a basket.
- As of October 2006, there were only 68 Boeing 707s in service with the world's airlines ... with just two flying passengers (SAHA Airlines of Iran and LADE airlines of Argentina). Thus, most airline companies have decided the aircraft is too old to be of use. They have invested the capital to provide their customers with a more reliable ride.
- As a reference point, Southwest Airlines, with a fleet of 535 aircraft (about the same size as the USAF tanker fleet), has an average age of 9 years (as of June 2008).
- It is essential for the Air Force to get a new tanker. Its KC-135 fleet averages 46+ years old. [In fact, some of them are eligible to join AARP!!!] If current assumptions continue, the last KC-135 to retire could be almost 90 years old – which is like sending the Wright Flyer into Desert Storm
- And ... the AF needs the tankers in sufficient numbers to do its mission – numbers do indeed matter

Chart 1



[Chart 2](#)

Tanker Generation and Fuel Loads



Taxi/Takeoff	2.0
Enroute	20.0
Offload	80.0
Orbit Fuel	40.0
Enroute	20.0
App/Landing	2.0
Alternate	5.0
Holding	8.0
Total Ramp	177.0

Generate
 Enroute
 On Station

Assumptions

- Average bum rate 10,000 lbs per hour
- Alternate time 30 minutes
- Holding time 45 minutes