

Long Range Strike and the Future Bomber Force



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21st Century Priority

- **General Moseley:** “The soul of an Air Force is range and payload”
- **Secretary Wynne:** “I’d salt and pepper persistence in there as well”
- **Admiral Mullen, CJCS:** “Conflict in the future will most likely – but not exclusively – demand increased precision, speed and agility.
 - “Put in place a new concept of strategic deterrence for the 21st Century in terms of training, equipping, theory and practice appropriate to a range of state and non-traditional threats in both nuclear and conventional realms. – Chairman’s Guidance, 1 Oct 07

Range, Payload, Persistence

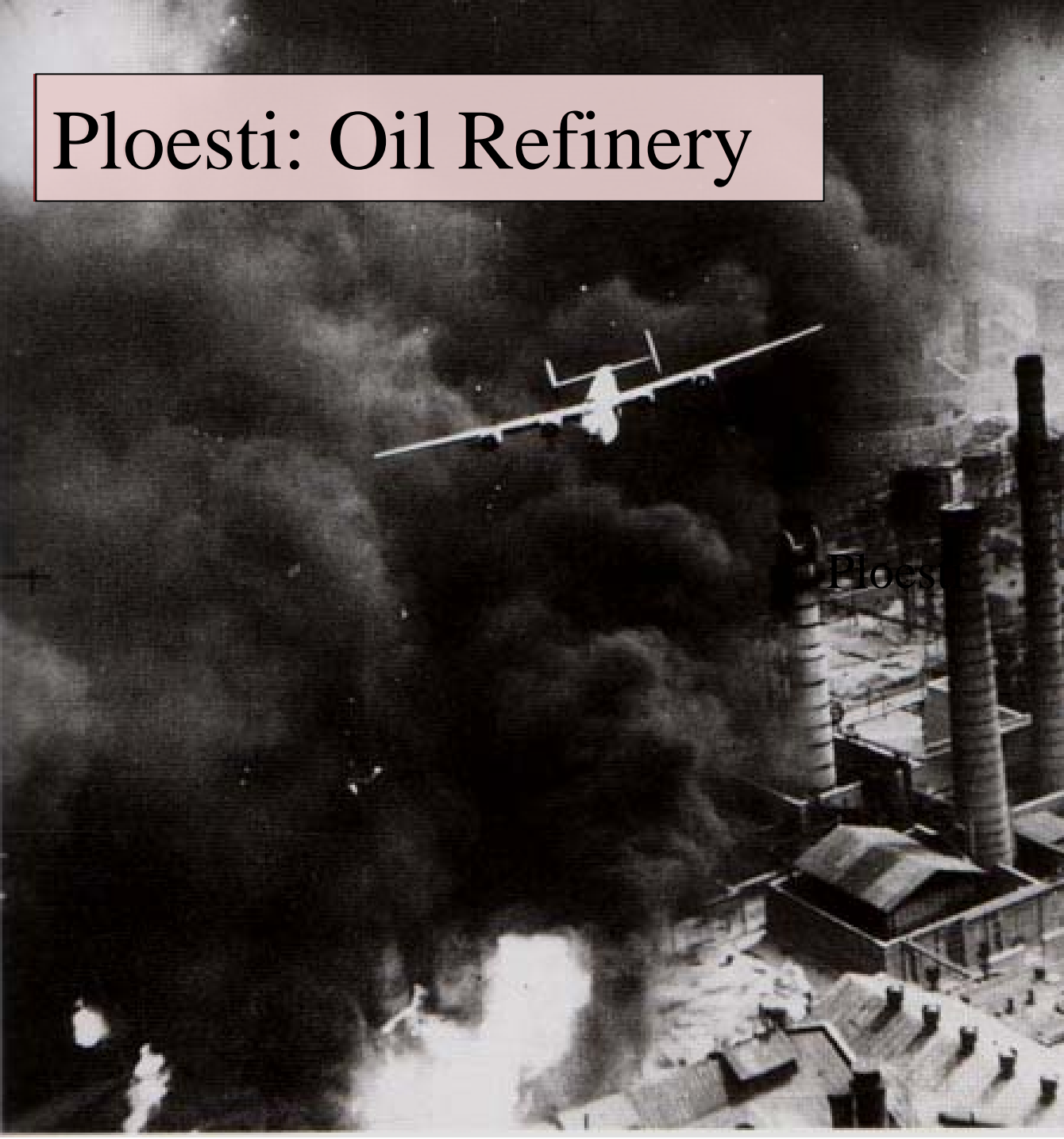


- **The reach of airpower has been one of its defining characteristics since World War I**
- **Long-range strike a job for airmen**

- **Joint campaigns demand attack on targets at long range**

- **Must hold at risk highly specialized targets**
- **Provide sovereign options**

Ploesti: Oil Refinery



- Critical deep target
 - Romania producing nearly half of Nazi Germany oil imports by 1941
- Far beyond reach of any other systems
- Expenditure of mission force acceptable if necessary
- 7 Medals of Honor
 - 5 for 1 Aug 43 mission

Leuna: Synthetic Fuels

- Synthetic oil plant over 500 miles from bomber bases in England
- 20 USAAF Missions May 1944 to April 1945
- 6629 Sorties
 - 1 Medal of Honor
- Production averaged only 9% of capacity

- Eisenhower on oil targeting: “This tactic had a great effect not only generally upon the entire war-making power of Germany but also directly upon the front.”

*B-47s on the ramp in
Morocco, 1956*

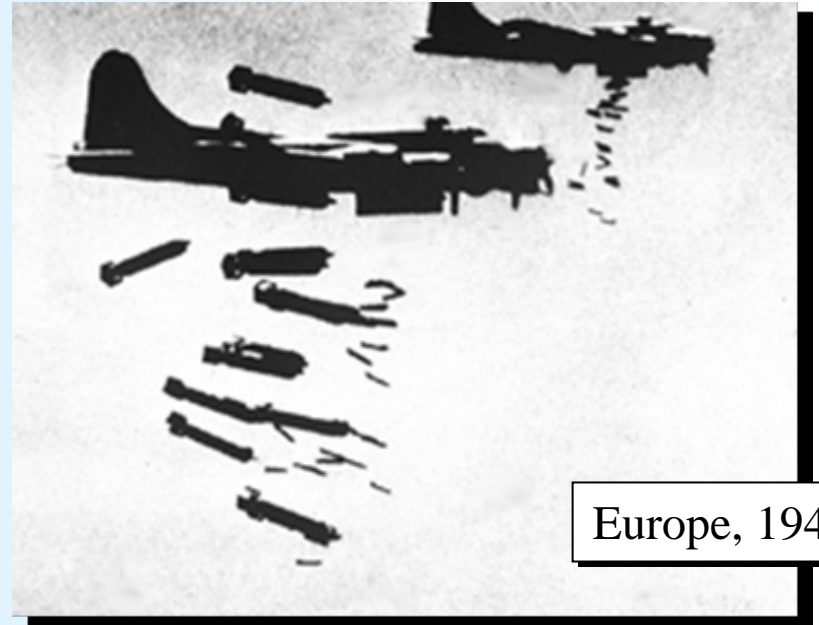
Cold War Deterrence



- Nuclear deterrence dominated bomber requirements 1948 to 1988
- Only bombers could deliver long-range, assured penetration
 - Clear match of forces and effects
 - Recognition of unique bomber roles
- Bomber acquisition a top national security priority

Unique Bomber Roles

- Combined Bomber Offensive focused on priority military and industrial targets
- Greater range and payload = targets only bombers could strike
 - Most strikes on strategic and deep interdiction targets
- Many cases of strategic bombers in direct support of ground forces



Europe, 1944



Linebacker, 1972

The Big Change: 1991-1992



Jan 1991:

- F-117s attack strategic targets in Gulf war
- Stealth, precision and effects-based operations

Dec 1991:

- End of the USSR
- Shift in nuclear deterrence mission

Jan 1992:

- B-2 cut to 21 aircraft*
- Decision created “bomber gap”

Jun 1992:

- SAC and TAC merge to form ACC
- Emphasized theater warfighting and effects

*21st aircraft added later

Risk Calculus in the mid-1990s

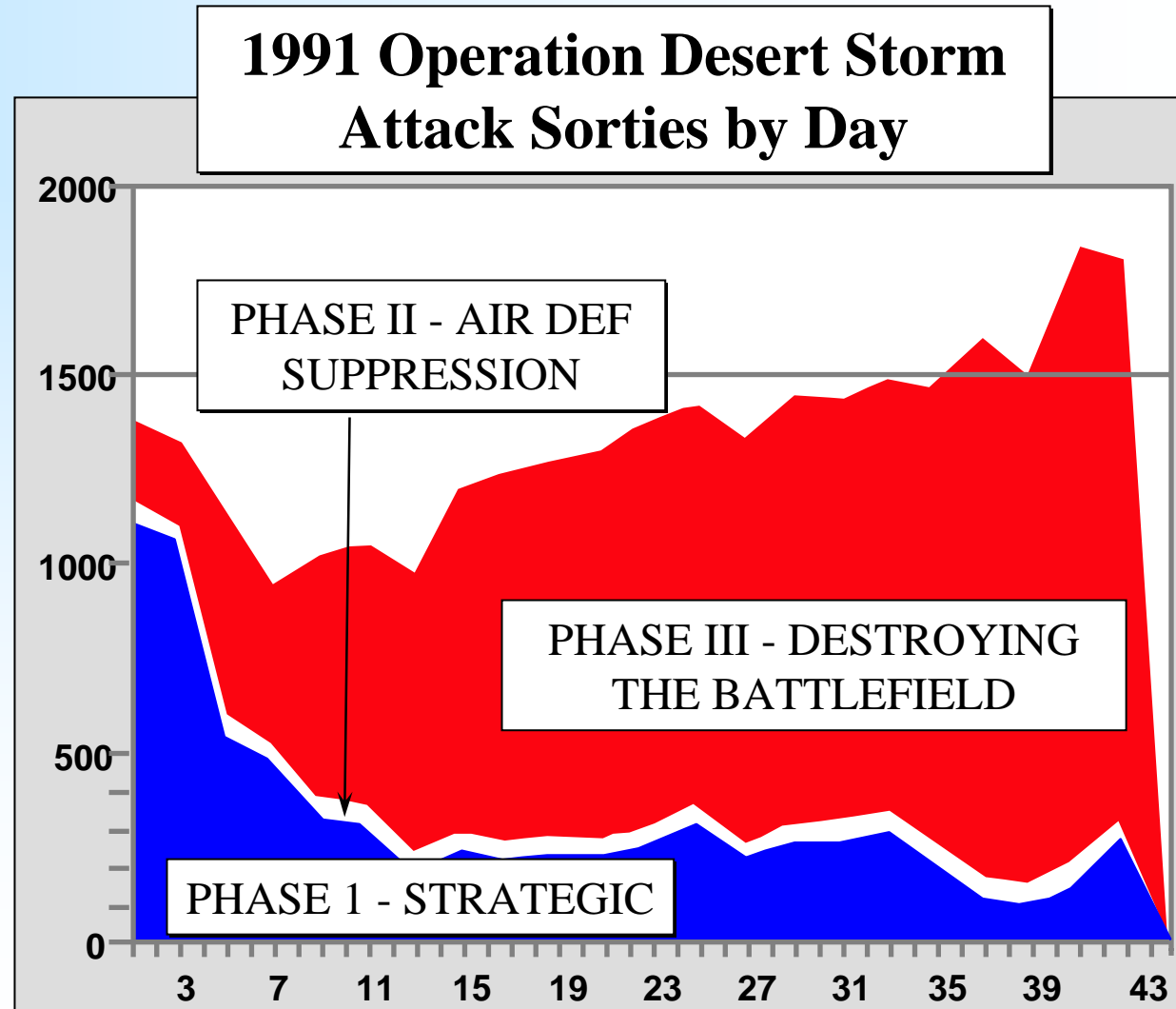


Undersecretary Kaminski, 1996:

- “We concluded from the **heavy bomber study** that with 20 B-2s, our bomber fleet size and mix will meet our mission needs.”
- “When we examined the specific industrial capabilities needed for the B-2 and previous bombers, we found there is **not a unique bomber industrial base.**”
- “The capabilities required to design, develop and produce bombers are **available in the broader military and commercial aircraft industries.** For example, all 54 of the key B-2 suppliers also supply other aircraft and/or other non-aircraft programs.”

Analytic Perspective: Bombers in the Joint Campaign

- Aggregated campaign analysis for theater operations
 - Sorties as metric
- Precision revolution across all fighter platforms
 - Bombers got precision later*
- Effects-based targeting stressed value of precision over mass payloads

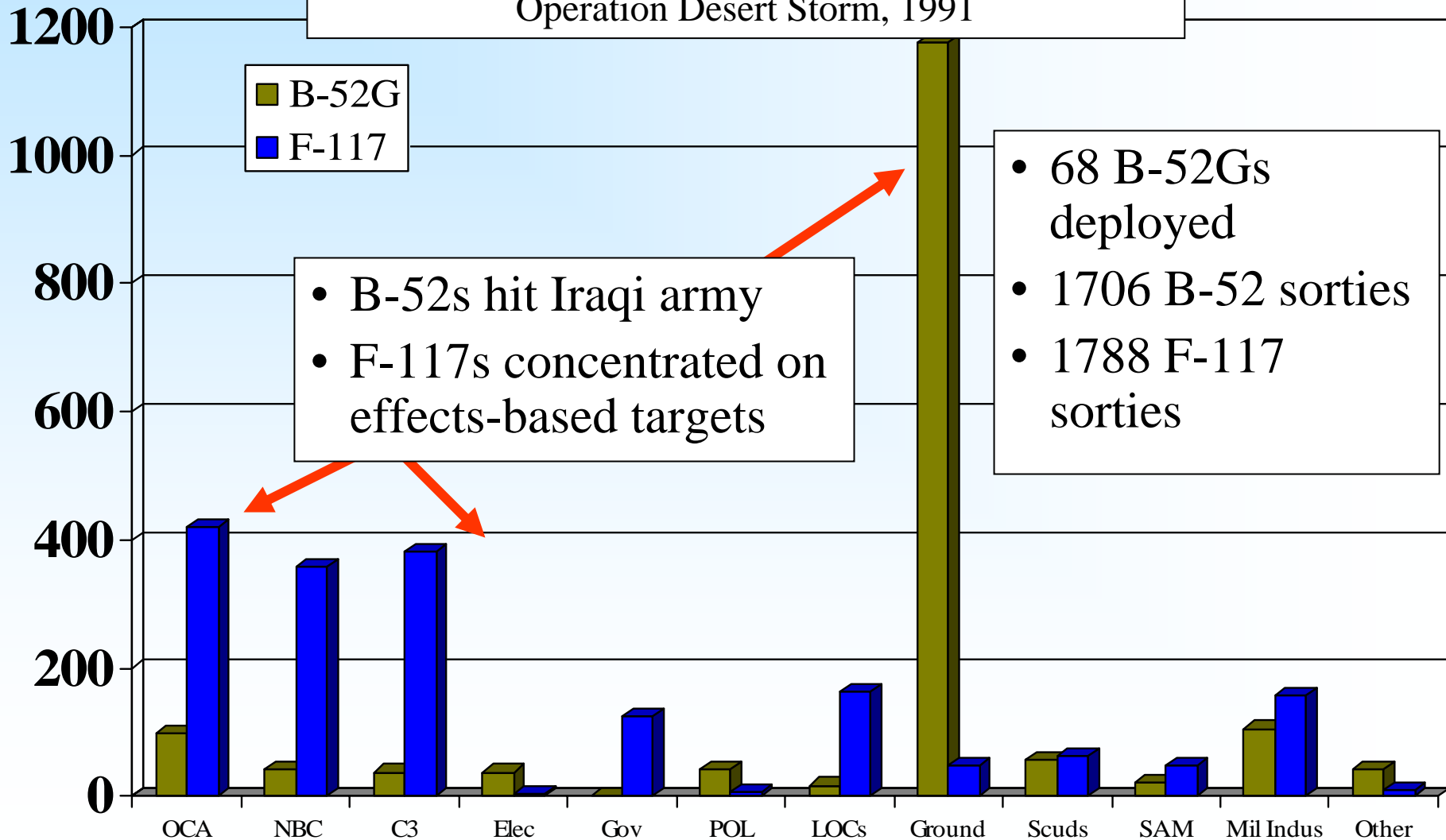


*Exceptions: CALCM, etc.

It's the Effects...

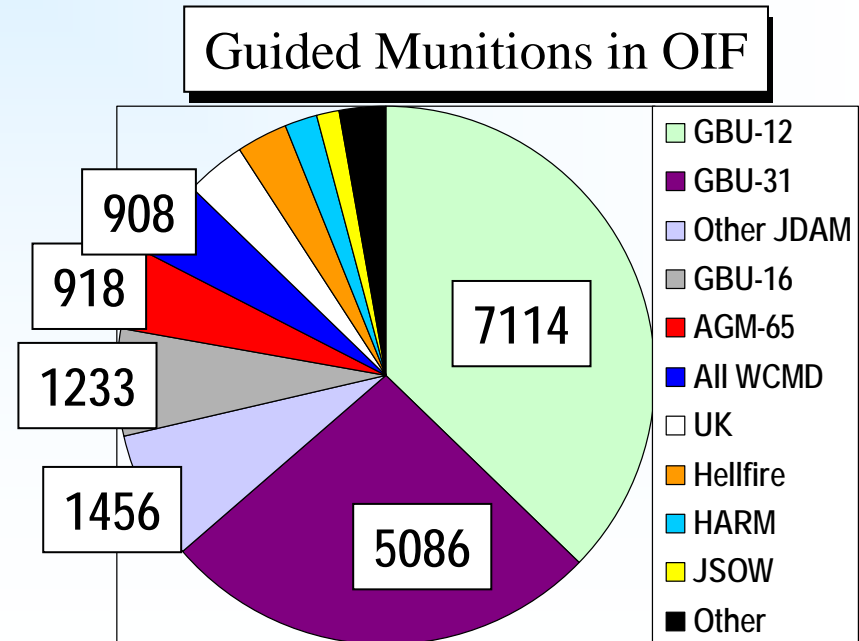
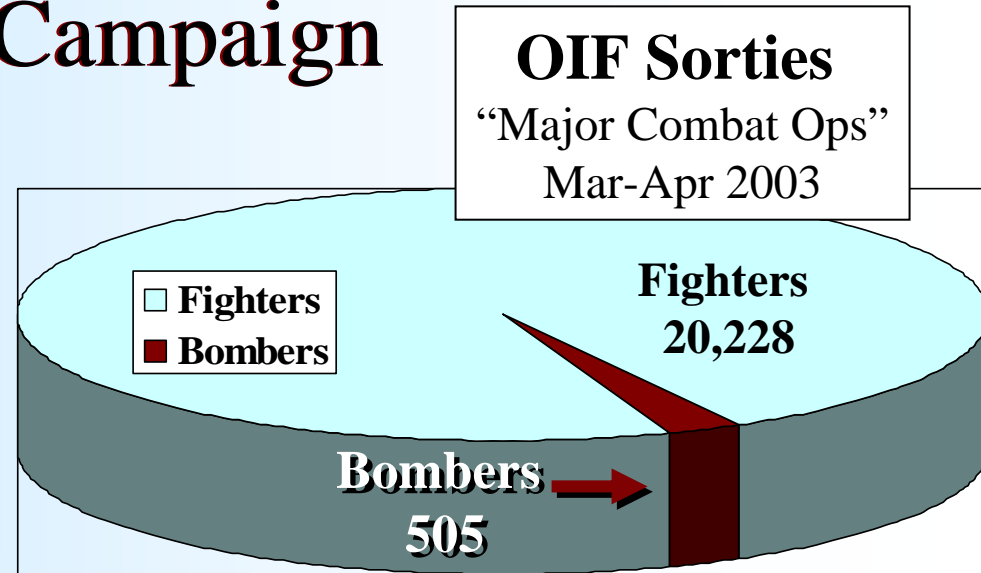
B-52 and F-117 Sorties by Target Type

Operation Desert Storm, 1991



Bombers in the 2003 Campaign

- Overall percentage of bomber sorties is small part of joint campaign
- Bomber **payload percentages** much higher
- Emphasis on effects not mass can obscure and minimize unique bomber roles in joint campaign analysis
- Diminishing returns in dense threat environment



Enduring Bomber Mission

- Strike any target, in any weather, anywhere, at any time, with high precision



Novi Sad Bridge



- B-2 debut as first all-weather precision bomber
- On many nights, B-2s were the only aircraft to drop bombs in high threat areas
- Total 97% successful firings of 609 JDAMs with 84% accuracy

Unique Bomber Roles

GWOT Roles

- Delivered about 70% of payload in OEF main combat operations
 - Weapons and communications upgrades made bombers essential to OEF
- Range and persistence for dominance in low-threat airspace
- **Stability ops...** B-1s and B-52s in daily close support for US & Coalition ground forces in Afghanistan



Emerging Strategic Requirements

- Targets at long ranges in heavily defended airspace
- Immediate response targets
- Targets demanding constant overwatch
- Numerous aimpoints requiring simultaneous attack
 - Requirement for instant bomb damage assessment



- “Our national military strategy really requires deep strike capability effective in the face of anti-access limitations or the limited use of overseas bases.” -- Maj Gen Jack Catton, ACC A8

Peer Competitor?

50 Su-30

200
Su-27

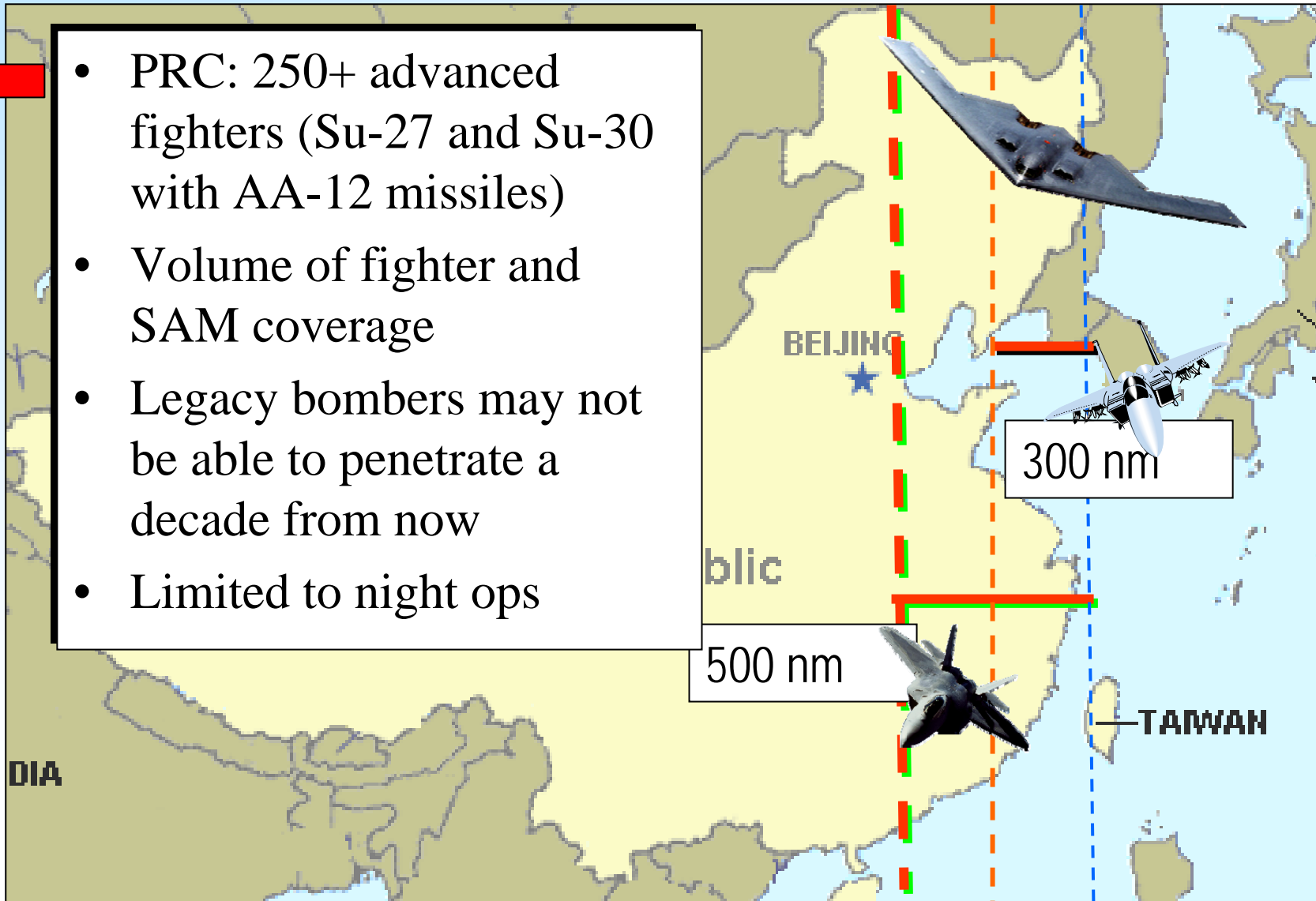
250
J-8a/e

700
Other
Air
To
Air

1500
Other
Air
To
Gnd

2700
Fighters

- PRC: 250+ advanced fighters (Su-27 and Su-30 with AA-12 missiles)
- Volume of fighter and SAM coverage
- Legacy bombers may not be able to penetrate a decade from now
- Limited to night ops



A New Bomber

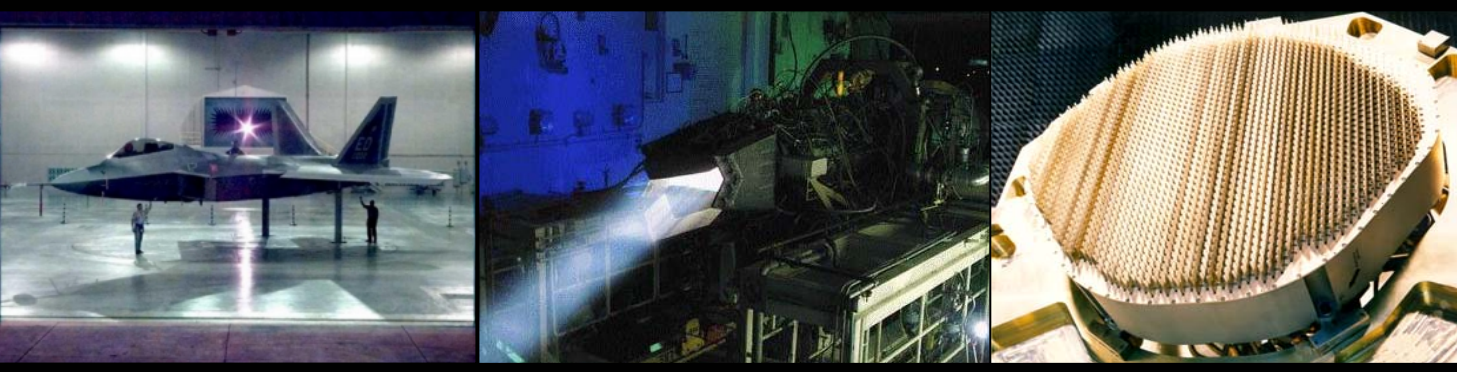
- “We can stand off now with some of the finest aircraft ever built....But against a fifth-generation defensive system, this is not going to work for us. We need to be able to penetrate. We need to be able to capitalize on those attributes of an Air Force, which are range and payload and persistence. **So this takes us to a new bomber.**”

– Gen Moseley, April 4, 2006.



Range? Payload? Manned? Survivability? Subsonic or supersonic?

Ready to Go Now



- Improved stealth design and **materials**
 - Easier to maintain
- Composites
- Advanced **engine** derivatives for high subsonic speeds
- Radars, **sensors** and other systems
- What's Not
- Hypersonic platform
 - Weapons a good possibility
- Space transiting vehicle

?

Technology in Hand to Build a Superior New Bomber

Mach 3 Bomber?

- Supersonic club: B-58, B-70, SR-71, early B-1 prototypes
- Engine performance for Mach 2-3 amply demonstrated
 - Survivability questions
 - RCS reduction (B-1 changes)
- For a bomber, supersonic pay-off not the same as for a fighter
- Current choices:
 - ADVENT engine technology can optimize subsonic strike mission
 - Range penalty for supersonic strike



- Successful USAF test flights up to Mach 3 cruise in 1964-1966
 - Fatal crash of AV/2
 - Later flew with NASA
- Already becoming vulnerable to long-range, high-altitude surface-to-air missiles (SA-5 deployed 1967)

A New Bomber

Range:

- 3000 miles +

Speed:

- High subsonic

Persistence:

- Survivability for day and night attack

IOC:

- 2018

Payload:

- Precision and effect
- To include heavy penetrating weapons

Sensors:

- Advanced, network capable, ISR, BDA

Fleet Size:

- About 100



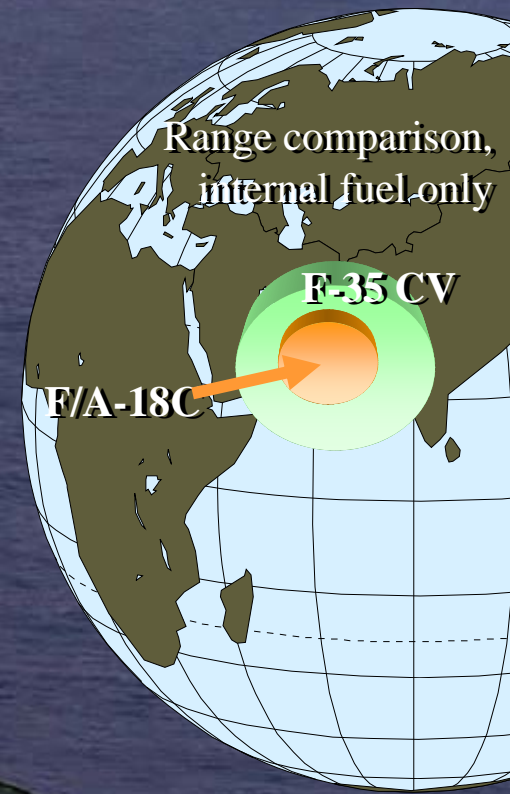
Future Concept

- A bomber in name only
- Information-centered platform in “wolfpack” concept of operations with F-22, F-35, other systems
 - For survivability and mission success
- Optimized for mobile targets
- Capable of striking any target, anywhere, in any weather, with high precision



Options: CVN 21?

Complimentary capability



- **Enhanced strike platform**
 - F-35 with longer mission radius
- **Limits on payload and persistence**
- **Navy UCAS – potential for long-range strike**
 - Surveillance variant ~2015
 - Strike/SEAD ~2020

Conclusion: 2018 Bomber

- Top national security priority
- Exciting challenge for USAF
- Technology timing is right for a bomber to meet long range strike requirements



“As you probably know better than most, we would never have bought a single combat type, including the B-17, if we had waited for a better type we knew was just around the corner.” -- Spaatz to Kenney, January 1947

