

## **4. AIR AND SPACE ISSUES AND PLANNING**

**[Related topics 1.8, 1.9, 1.26, 1.27, 2.1, 2.15, 5.4]**

### **HIGHEST PRIORITY TOPICS FOR FY09 (4.1 THROUGH 4.8)**

#### **4.1 USAF Grand Strategy**

- How would an Airman write Grand Strategy?
- What can Air, Space, and Cyber contribute to the national dialogue?
- Issues: basing, force structure, constructive VS destructive use
- What type of conflict are we preparing for?
- What are the current USAF missions and priorities?
- Should the focus be air, space, and cyber? If so, why and how are they interrelated?
- Purpose and goals of strategy.
- What is the utilization of the DIME Model in meeting USAF mission requirements?
- How will the USAF better exploit and support other instruments of national power?
- What can USAF delivered Air, Space, and Cyber capabilities contribute to other instruments of power?
- What is the hard power/soft power balance?
- What are the USAF mission sets that support this?
- What is the process from Joint integration to interagency integration?
- What is the cost/benefit of other Service contributions to USAF missions?

POC: Lt Col Peter A. Garretson, AF/A8XC, 703-692-4795

Priority: 1a

Key Terms: forward basing, WMD, humanitarian, capability shortfalls, base closures, instruments of power, DIME, force structure.

#### **4.2 Nuclear Mission**

- When is it too late to recapitalize USAF nuclear capabilities without compromising our deterrence capabilities?
- At what point will the lack of attention to nuclear weapons result in the loss of their relevancy?
- Does the USAF want or need this role?
- Does the current focus include concerns over maintaining the existing USAF R&D industrial base and S&T force?

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Priority: 1A

Key Terms: nuclear capabilities, deterrence, R&D industrial base, S&T force

### 4.3 Industrial Base

- How should the Air Force evaluate the health of the capital in which it depends (intellectual, technical, industrial)?
- Should the focus be on recapitalization of the science and technology (S&T) infrastructure? Training, educating, and retaining S&T specialists? How is the USAF monitoring its competitive position?
- Forecast science and technology needs (cultivating and managing intellectual skills).

POC: Lt Col Peter A. Garretson, AF/A8XC, 703-692-4795

Priority: 1a

Key Terms: R&D industrial base, S&T force, retention efforts, human capital

### 4.4 What is a proper criteria for balancing national security needs vs. technology competitiveness in space?

- How should the USAF develop its list of protected technologies for International Traffic in Arms Regulations?
- How should the USAF coordinate this list with others Services and agencies?
- Is preserving the U.S. industrial base looked upon as a focus or a requirement?
- Do the current criteria create unintended consequences, and if so, what are they?
- Looking at items on the U.S. munitions list, are there any that should be removed or waived in order to advance U. S. national goals?
- What should a waiver process look like?

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Priority: 1a

Key Terms: technology control regimes, US munitions lists, waivers

### 4.5 Air Force Capabilities in 2040

- Suggest ideas and alternatives for future capabilities and requirements that the USAF and DOD need to acquire by 2040.
- Consider Airlift, ISR, UAV, EW, Fighter, Bomber, Tanker, C2, Space, Cyber, Intel, Logistics, Force protection and sustainment roles
- Consider the range of operational environment – rapid deployment, foreign internal defense, humanitarian, peer competitors, major theater war, reconstruction and stabilization
- Define the operational vision for the Air Force in the global environment. How should the Air Force develop, acquire and sustain forces?
- How is the Air Force maintaining its nuclear competency? When will the current lack of attention result in mission failure?
- Forecast science and technology needs (cultivating and managing intellectual skills).
- Should energy resource management become a priority? What are the potential security implications? Is space based solar power an option? Does U.S. dependency on petroleum allow for this possibility? Are alternative energy resources an option to power USAF assets?

POC: Lt Col Peter A. Garretson, AF/A8XC, 703-692-4795,

Dr. Chris Cain, AWC, 334-953-1028

Priority: 1a

Key Terms: future requirements, rapid deployment, foreign internal defense, humanitarian, peer competitors, major theater war, Airlift, ISR, UAV, EW, Fighter, Bomber, Tanker, C2, Space, Cyber, Intel, Logistics, Force protection and sustainment roles

#### **4.6 Propose a Sustainable Air Force Recapitalization and Acquisition Strategy**

- Suggest ideas and alternatives that the USAF and DOD can do to implement a successful recapitalization strategy.
- When is it too late to recapitalize?
- What is the operational vision of the USAF?
- What are the impacts of recapitalization on the global operating environment?
- Can the USAF develop and sustain the current focus?

POC: Dr. Chris Cain, AWC, 334-953-1028

Priority: 1a

Key Terms: Recapitalization and Acquisition Strategy, operational vision

#### **4.7 What is the relationship between the USAF and space?**

- How to best integrate or separate the various domains of air and space?
- What are the potential impacts of the weaponization of space?
- Develop a space protection strategy.
- What is necessary to recapitalize space assets?
- Suggest ideas and alternatives that the USAF and DOD must consider in the event of an arms race in space.
- Organizing to exploit space

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Priority: 1a

Key Terms: domains of air and space, impacts of the weaponization of space, space protection strategy, arms race in space, exploitation of space

#### **4.8 Planetary Defense (Comets and Asteroids)**

- What is the specific role of the Air Force in preparing for asteroid planetary defense?
- Which organization should lead this effort: NASA or the Air Force?
- Global integration? International efforts?

POC: Lt. Col Peter Garretson, HQ USAF/A8XC, 703-428-0891

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Key Terms: asteroid planetary defense, NASA

## OTHER TOPICS FOR FY09 GROUPED BY PRIORITY

### 4.9 Human Capital

- How do we improve education, training, and experience levels especially in S&T?
- How do we improve Air Force leadership, warrior and knowledge training for Air Force capabilities?
- What are the main focus areas for sustaining future education? How can the Air Force ensure that personnel are tracked and utilized in the appropriate career field?
- How should the Air Force rationalize officer development with force development in the following areas:
  - Cyber
  - Nuclear
  - FAO/POLMIL and cultural/language expertise
  - Space

POC: Lt. Col Peter Garretson, HQ USAF/A8XC, 703-428-0891

Priority: 1

Key Terms: Human capital, cyber, nuclear, FAO/POLMIL, space, cultural/language expertise

### 4.10 How does the AF train leaders with the knowledge and skills sets needed to do more with less?

- Suggest knowledge and skill sets that a leader might need to succeed in environments where they are asked to do more with less.
- How can one best lead and motivate a team in an environment of personnel force reductions?
- Do we have the right PME approach to develop leaders for the Air Force to meet future challenges? Does the PME process enable leaders to pursue transformational change or does it reinforce the status quo?
- Has PME evolved into a training program or is it still *Professional Military Education*?
- Are there Air Force missions that can be shed? Suggest additional missions and concepts that might be candidates and defend those ideas.
- Has the Air Force proclivity for engineering and hard sciences education shifted the focus away from other skill sets?
- Should the Air Force Academy/ROTC/OTS be expanded to include more multidisciplinary knowledge?

POC: INSS, Lt Col Nancy Rower 719-333-2717/DSN 333-2717

Priority: 1

Key Terms: USAF leadership, PME, skill sets, knowledge, core competencies

### 4.11 Theater Missile Defense (TMD)

- How does missile defense fit into the USAF's core competencies?
- What are the arms control implications of TMD?

- What are the operational shortfalls of TMD today?
  - Does missile defense have a utility for aerial denial and deterring USAF air superiority/dominance?
  - Consider TMD/Cyber integration benefits and requirements
- POC: Lt. Col Peter Garretson HQ USAF/A8XC, 703-428-0891  
 Priority: 1  
 Key Terms: TMD, arms control, core competencies, aerial denial, cyber integration

#### **4.12 Emerging Space Operations**

- Given the rate of and potential for technological advancement in the commercial space sector, discuss the potential for adversaries to be able to develop affordable global strike capabilities.
- Persistent surveillance:
  - Discuss the potential for technological breakthroughs that might be useful in enabling longer staring space surveillance systems.
  - What other new technologies might improve this capability?
- Explore and discuss “flagging rights” for spacecraft and ship:
  - Is there a future for space tourism, and what are the implications for the Air Force?

POC: Maj Chris Byrom, U.S. Department of State, ISN/SPO, 202-647-7907

Priority: 1

Key Terms: global strike, space, persistence surveillance, flagging rights, ships

#### **4.13 Assessment of Strategic Air Power in Recent Conflicts (Gulf Wars 1991 and 2003, Kosovo 1999, Afghanistan 2001)**

- Review the psychological impact of airpower during Operations: Desert Storm, Allied Force, Enduring Freedom, and Iraqi Freedom)
- What were the psychological impacts of various air campaigns? Can we identify what it takes to influence an adversary’s decision to cease combat operations?
- What were the actual effects on target sets?
- Is gradual escalation of air power an effective means against an adversary?

POC: Dr. Dan Kuehl, NDU, (202) 685-2257.

Priority: 1

Key Terms: IO, IW, measures of effectiveness, Unified Joint Task List

#### **4.14 What are the implications of space situational awareness deficiencies for space control?**

- Should there be a standing plan in response to an attack on US space assets?
- What policies, concepts of operations, and technologies are needed to improve space situational awareness? How can these be diffused across all space sectors?
- How can we tell if a satellite has been attacked? How will the source of the attack be attributed?
- What technologies are available or projected for adversaries and how might they use them against US assets?
- What are the consequences of the loss of space capabilities to the terrestrial warfighter?

- What could current capabilities provide in terms of responses?
- How should the current state of space situational awareness be advanced to better assist operational forces?
- When do/should the systems get integrated? Earlier rather than later?

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Priority: 2

Key Terms: situational awareness, space control, policy, satellite attack responses

#### 4.15 Future of Airlift

- What is the appropriate mix of transport aircraft to allow the Air Force to meet its mission requirements?
- What would be the effect of acquiring a joint cargo aircraft?
- How will changes in the airline industry (e.g., bankruptcies, shift to regional jets, foreign ownership) affect the Civil Reserve Air Fleet (CRAF)?
- What is the importance of the next aerial refueling platform purchase? How should the next selection process work? Should it consider the impact on America's defense industrial base?
- Are there other means to achieve airlift capabilities, for example dirigibles?

POC: Lt Col Peter A. Garretson, AF/A8XC, 703-692-4795

Priority: 2

Key Terms: transportation aircraft, airlift, joint cargo aircraft, domestic airline industry

#### 4.16 Global Strike

- Discuss the tradeoffs in conducting Global Strike operations from CONUS vs forward bases
- Discuss command and control relationships of various COCOMS for very prompt global strike assets, such as hypersonic craft, directed energy, long-range ballistic vehicles, and other "silver bullet" operations.
  - o For example: discuss command and control of a hypersonic craft launched from CONUS in support of a global COCOM such as US STRATCOM or SOCOM striking a target in support of an urgent need in another COCOM's AOR.
- What would be the effect if the Air Force converted all or some portion of the CONUS ICBM force to conventional warheads?
- Global Strike can be considered prompt or persistent, discuss the differences.
  - o Does the distinction between the two make sense?
  - o Define prompt in 2015.
  - o In the F2T2EA process there is a necessary pause to permit decision makers to decide to "pull the trigger" and target and engage a target. Are there other ways to shorten the time needed to F2T2 and the decision making cycle?
- Describe an optimum prompt global strike architecture for the nation in 2015.
- Describe an optimum command and control architecture for special operators or platoon-level ground force commanders to access and request support from extremely prompt global strike assets such as directed energy, space or near-

- space loitering weapons, or ballistic vehicles launched from great distances.
- Adversaries are working diligently to obscure targets in a wide variety of creative ways. Suggest alternate approaches, techniques, and/or technologies that might mitigate these actions and improve targeting capabilities.

POC: Lt. Col Peter A. Garretson, AF/A8XC, 703-692-4795

Priority: 2

Key Terms: global strike, forward bases, ICBM, F2T2EA, obscure targets, command and control, directed energy, hypersonic craft

#### **4.17 Assess the threat posed by adversaries' use of air and space capabilities.**

- What disruptive technologies are adversaries investing in?
- How do other nations intend to use space power (communication, GPS, remote sensing) to facilitate terrestrial warfighting?
- How do other nations intend to use emerging technologies (directed energy, advanced missile technology, advanced air-to-air capabilities, computing, and advanced materials) to facilitate warfighting?
- Will other nations "leap-frog" over U.S. legacy systems?
- Examine adversary acquisition of ISR.
- How could future adversaries mitigate U.S. air and space advantages? What are the ramifications if they do find ways? What low-technology means might adversaries use?

POC: Dr James Smith, INSS, 719-333-2717/DSN 333-2717

Priority: 2

Key Terms: counterspace, space operations, Space Command, space control, foreign threat.

#### **4.18 Assess the legal, domestic, and international impact of the U.S. deploying weapons in space.**

- Address overall impacts:
  - Define weaponization and what a weapon is.
  - Examine pathways to weaponization of space.
  - How do we get there from here?
  - Why would we weaponize space?
- Address international impacts:
  - How do adversaries, neutrals, and allies view space weaponization and how would they react if the United States deployed weapons in space?
  - What are the international security issues that need to be addressed?
  - How should the United States prepare for competition along each pathway and how would we deter adversaries from taking any of these pathways?
- How might space weaponization impact the freedom of overflight of military, civil, and commercial systems?
- Address domestic impacts:
  - Does space weaponization enhance or weaken domestic security?

- o What are the unintended consequences of deploying—or using—weapons in space?
- o Should the United States move now to take control of the “high ground”?
- o What public affairs approach should the US pursue to explain the case for weaponizing space?

POC: Mr. Gil Siegert, OSDP, Space Policy Directorate, 703-607-0356

Priority: 2

Key Terms: space operations, space weaponization, foreign relations, overflight, commercial, force application, alliance, deterrence, public affairs, legal

#### **4.19 What role could force application from space play in future military operations?**

- Examine the value of space systems in responding rapidly to expected crises in the future (e.g., Space Operations Vehicle, Space Maneuver Vehicle, Common Aero Vehicle, Spaceplane, reusable launch vehicles, space-based weapons, conventional ballistic missiles, and hypersonic vehicles).
- Examine concepts of operation for new space force application systems.
- Examine the relationship between rapid response of such systems and a commander’s decision timelines.
- What are the arms control implications of conventional weapons delivered from reusable vehicles?
- Are there significant differences politically between deployment from orbital and suborbital vehicles?
- Could commercial reusable launch vehicles (RLVs) be used to deploy conventional weapons?
- Evaluate the results of recent wargames and their lessons for space operations.

POC: Mr. Gil Siegert, OSDP Space Policy Directorate, 703-607-0356

Priority: 2

Key Terms: space-based weapons, space operations, conventional weapons, reusable vehicles, arms control, orbital, suborbital, RLVs, hypersonic vehicles

#### **4.21 What are the obstacles and potential solutions to developing joint space doctrine?**

- Survey the current roles performed by the Services and other national organizations in providing national security space capabilities.
- What conceptual, organizational, and cultural impediments exist to developing joint space doctrine?
- How well is JP 3-14, *Space Operations* being implemented? Why did it take so long to produce joint space doctrine?
- What role should the USAF play in resolving these impediments?
- What type of space doctrine is needed to support joint operations?
- If developed, what are the lessons learned, what are future applications?
- Are there significant overlaps if all services are expected to perform all space missions?
- Amplify existing doctrine on command relationships for command and

control of space forces.

- Elaborate on the types of support space operators provide as warfighters—general, mutual, close, and direct support—with associated vignettes from recent operational experience.
- Provide a template for an establishing directive applied specifically to supporting space operations.

POC: Dr James Smith, INSS, 719-333-2717/DSN 333-2717

Priority: 3

Key Terms: Organization, culture, joint operations, doctrine, lessons learned, space

#### **4.22 How can/should the Air Force Reserve and Guard role be expanded for emerging air/space/cyber roles and functions?**

- How can we best expand on the “air” dimension with space and cyber functions?
- Should expansion be limited to increasing emphasis on support areas such as medical, law enforcement, and chaplain?
- Is homeland defense and civil support an appropriate arena for role expansion?

POC: Lt Col Kenneth Wessels, AF/A3SHA, 703-696-3637

Priority: 3

Key Terms: Air Force Reserve, Air National Guard, emerging roles, air, space, cyber

#### **4.23 Is it time for new Key West discussions like those that led to the 1947 agreement on service roles and missions?**

- Should similar talks be held today and what roles should the different services have?
- What potential tradeoffs could be made between DOD and others in the interagency (State, NASA, etc.) that would reduce costs while keeping risks at an acceptable level?
- Specific concerns: service responsibility for UAV operations, space control.

POC: Dr James Smith, INSS, 719-333-2717/DSN 333-2717

Priority: 3

Key Terms: joint operations, organization, pol-mil