Headquarters U.S. Air Force

Integrity - Service - Excellence

National Security Space Policy & Architecture Symposium

Dr. Ron Sega
Under Secretary of the Air Force
NDIA Participation

- **Merger of two organizations in 1997:**
  - American Defense Preparedness Association and the National Security Industrial Association

- **Important mission**
  - ADVOCATE: Cutting-edge technology and superior weapons, equipment, training, and support for the War-Fighter and First Responder
  - PROMOTE: A vigorous, responsive, Government – Industry National Security Team
  - PROVIDE: A legal and ethical forum for exchange of information between Industry and Government on National Security issues

- **Commitment to Space Partnerships Theme**
  - Reflects NDIA’s quest for great efficiencies
Heritage to Horizons

- Hap Arnold: “The first essential of the airpower necessary for our national security is preeminence in research.”

- Bernard Schriever: “It may be said that warfare has acquired a new phase - technological war. In the past, research and development were only preparation for the final and decisive testing of new systems in battle. Today the kind and quality of systems which a nation develops can decide the battle in advance and make the final conflict a mere formality - or can - bypass conflict altogether.”

- Dwight Eisenhower: “We should base our security upon military formations which make maximum use of science and technology in order to minimize numbers of men.”
The mission of the United States Air Force is to deliver sovereign options for the defense of the United States of America and its global interests -- to fly, fight, & win in Air, Space, and Cyberspace.
Back to Basics in Acquisition

- Four-stage process
  - System Production
  - Systems Development
  - Technology Development
  - Science & Technology
- Reapportion Risk
  - Lower risk in Production
    - Use mature technology
  - Higher risk in S&T
Acquisition Stages--Block Approach

System Production
Block 1 -> Block 2 -> Block 3

Systems Development
Block 2 -> Block 3 -> Block 4

Technology Development
Block 3 -> Block 4 -> Block 5

Science & Technology
Block 4 -> Block 5 -> Block 6

Ingrity - Service - Excellence
Tactical Satellite (TacSat)-2 Experiment

Successful Launch, 16 Dec 06, Orbital Minotaur

**Capability:**
- Field tasking/data downlink in same pass
- One meter tactical imagery
- Specific emitter ID & geolocation
- Dynamic retasking, cooperative with EP-3
- Autonomous tasking/checkout/on-orbit maintenance, on-board data processing
- Total mission cost w/ launch ~$63M

**Status:**
- First of TACSAT series on-orbit
- 18 month development to launch cycle
- Utilized the Minotaur launch vehicle
- Launched from Wallops Island Facility 16 Dec 2006
- Successfully commanded spacecraft from China Lake ground station
Defense Meteorological Satellite Program Launch

F-17

Launched 5 Nov 2006 on a Delta 4

Vandenberg AFB, CA

Polar Orbit

Altitude of 450 Nautical Miles

Primary Mission: To provide visible and infrared imagery of clouds, day or night
Heritage to Horizons

General Bernard Schriever:

"We must strive to be first in technological accomplishments if America is to continue its growth in security, maturity and peace. That is why and how we have come from Kitty Hawk to Aerospace."
Make energy a consideration in all Air Force actions

- Accelerate development and use of “Alternative” fuels
  - Synthetic Fuel for Aviation
  - Renewable Energy for Installations
- Enhancing energy efficiency--aviation and infrastructure
- Promote a culture where Airmen conserve energy
Examples of AF Energy Initiatives in the United States

Demonstrate H₂ Production & Military Fuel Cell Vehicle
Grand Forks AFB, ND

Fuel Cell/Electric Warehouse Tractor
Selfridge ANGB, MI

Low Speed Vehicles
Shaw AFB, SC

Synthetic Fuels Research, Air Force Research Lab, WPAFB, OH

Air Force Energy Office, Tyndall AFB, FL

Advanced Power Technology Office, Robins AFB, GA

B-52 SynFuel Flight Demo, Edwards AFB, CA

Waste energy and ice plant, Dyess AFB, TX

18 MW Photovoltaic generation, Nellis AFB, NV

Wind generation farm, FE Warren AFB, WY

122 KW Photovoltaic project, Luke AFB, AZ

Demonstration Sites
Center of Excellence
Potential US Energy Resources

Domestic Reserves*

- Shale: 1400 billion barrels
- Coal: 800 billion barrels of FT
- Oil: 22.7 billion barrels

Total: 2.2+ trillion barrels equivalent

Annual Domestic Consumption*

- Oil: 7.5 billion
- Natural Gas: 3.8 billion
- Coal: .005 billion

Total: 11.1 billion barrels equivalent

* Source: DOE/Energy Information Administration, 2005
Space Program Managers’ Meeting

- Potential Topics
  - Integration
    - Comm Utility (Across Space, Cyber, etc.)
    - ISR (Space, Air, etc.)
  - Back to Basics
    - Increase Discipline (System Engineering, Specs / Standards, etc.)
    - Reduce Acquisition Cycle Time (RFPs, Contracts, etc.)
    - Establish Baseline—Deliver on Cost and Schedule
  - Workforce
    - Skills needed (Today and into the 21st Century)
    - Personnel Policies

- Conference Outcomes
  - Lessons Learned
  - Challenges
  - Actions
Tropical Storm Alberto
Fischer-Tropsch Process

Natural Gas
Oil Shale
Coal
Pet Coke
Biomass
Wastes

Synthesis Gas Production → CO
H₂

Air → O₂

Oxygen Plant

Synthesis Gas
Production

FT Liquid Synthesis

Product Recovery

Power Generation

Tail Gas

Liquid Fuels

Wax Hydrocracking

Wax

Hydrogen Recovery

Hydrogen

Transportation Fuels

Tail Gas

An Option

Hydrogen Separation

Liquid Fuels

Hydrogen

Wax

Hydrogen

H₂

Fischer-Tropsch Process
Space Operations in the 21st Century

Knowledge vs. Time

- Past: Qualitative reduction in required knowledge over time due to automation and deterministic-type decisions
- Future: Increased level of knowledge required--greater judgment and cognition

Space Control
Dynamic Tasking
GPS III Approach

GPS IIIA

GPS IIF cap plus: L1C
+10 dB
Growth Path

Demo Cross-Link

GPS IIIB

GPS IIIA plus
Cross-Link capability

Demo Spot Beam

GPS IIIC

GPS IIIB plus
Spot Beam capability

GPS III iCDD Addendum JROCM, signed 31 Oct 06