

The Space – Nuclear Nexus

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The Space-Nuclear Nexus

- The Historical Nexus
- The Operational Nexus
- Arms Control and Nonproliferation
- Sovereign Policies, and
- International Policies and Norms

The Historical Nexus

- Fractional Orbit Bombardment System (FOBS), e.g. Krushchev 1961, 1962, to overcome U.S. forward basing advantage in Turkey, Europe, Asia.
- Deployed ~1968. Phased out under Outer Space Treaty (October 1967), and SALT I and II.
- Early nuclear Nike Zeus (~1960-66) and nuclear Thor (~1962-76) ASAT systems
- U.S. Safeguard ABM, 1974 ~ Nuclear tipped interceptors.
- SDIO ~ Nuclear-tipped interceptors.
- Brilliant Pebbles, Non-nuclear, ~ 1000 or more small attack satellites.

Operational Nexus

- Defense Support Program (DSP) missile warning satellites.
- SBIRS-High = DSP replacement.
- Space Tracking and Surveillance System (STSS)

To the extent that these systems might lead to false alarms, missile warning satellite systems could be the source of nuclear misunderstanding that could quickly escalate.

Operational Nexus, cont'd

- Command, control and communication networks, and
- Sensor networks

In the U.S. the trend is for these systems to become more intertwined because of:

- Joint Interoperability considerations
- Cost and complexity
- Coalition interoperability

False alarms are a concern here also.

The Proliferation Nexus

- Space launch capabilities can translate into long range missile capabilities and visa versa.
- Early nuclear weapon states were also early space satellite states.
- Capability in space and/or in nuclear weapons can be viewed as establishing national prestige.

First Nuclear Test and First Satellite

- USA 1945
- USSR 1949
- UK 1952
- France 1960
- China 1964
- India 1974
- Pakistan 1998
- North Korea 2006
- USSR 1957
- USA 1958
- France 1960
- China 1970
- UK 1971
- India 1980
- Pakistan 1990
- Iran 2009

Over 50 space-faring nations have launched satellites

Selected ASAT Tests

- 1959 U.S. Bold Orion 119B, B-47 air-launched near Explorer 6 satellite.
- May 23, 1963, U.S. Nike Zeus DM-15S Project 505 ~ “Mudflap” (nuclear capable) near Agena D satellite.
- 1964-1975 - U.S. Thor LV-2D Project 437 Johnston Atoll 18 tests (nuclear capable)
- November 1, 1968 USSR Cosmos 252 against Cosmos 248 (Co-orbital).
- September 13, 1985, USAF F-15 + ASM-135 missile against AF Solwind P78-1.
- 1997, MIRACL Laser against AF MSTI-3 satellite.
- January 11, 2007, China SC-19 rocket against FY 1-C weather satellite.
- February 20, 2008, U.S. Aegis BMD shutdown of USA 193.

ASAT Capabilities

- Between 1960s and the 1980s, both the U.S. and the USSR developed and tested ground-based and airborne ASAT systems.
- However, no deployment of space-to-Earth or space-to-space attack systems.
- SDIO Brilliant Pebbles, and Near-Field Infrared Experiment (NFIRE) have raised Congressional concerns.
- Commercial launch vehicles could be adapted to have ASAT capability.

A Symbiotic Relationship

Space-Nuclear-ABM

- “The US Army's proposal to convert the Nike Zeus missile to the ASAT role in November 1957 and later in January 1960 marked the beginning of an almost symbiotic relationship between ABM and ASAT research and development. This was inevitable given the similar requirements and methods to detect, track and intercept both missiles and satellites. Moreover, the possession of exoatmospheric ABM missiles by definition provided a limited ASAT capability or certainly a system that could be transformed into one with relative ease.” See *“The Militarization of Space,” Stares 1985*
- ” ... many of the experimental anti-missile systems will become de facto ASAT devices long before they can prove their feasibility for deployment as strategic defense weapons. In effect, the S.D.I. promises to become a breeding ground for new generations of ASAT weapons, if nothing else.” See *“Space and National Security,” Stares 1987*

The Space-Nuclear Nexus

- 2001 Rumsfeld Commission warns of “Space Pearl Harbor.”
- 2004 Air Force Secretary James Roche: “The war in space has begun.”
- 2004 and 2008 Reports of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack.

Sovereign Policies toward Space

- Increasingly, Space is viewed as a “strategic” asset, and “Critical National Infrastructure.”
- Especially during the past 8 years in the US, satellites (and the space they occupy) have been regarded by many as “sovereign” U.S. territory.
- Of course, we don’t own space; it’s not ours.
- To make this point many nations, including Russia, China, Iran and North Korea, have pushed back in various ways.

International Policies and Norms

- Codes of Conduct
- Rules of the Road
- Space Debris
- Non-interference with National Technical Means of Verification, e.g. SALT, CFE, START, INF

Conduct relative to nuclear weapons and conduct relative to space both involve a perception of certain acknowledged and observed practices, and also certain “taboos.”

Future Policy and Diplomatic Initiatives

- As with nuclear weapons, space policy and diplomatic initiatives that strengthen codes of conduct, rules of the road, international cooperation, and “taboos,” are all in the right direction.
- In the extreme, policies that cause space to be viewed as “sovereign” territory can lead to escalation, even to the use of nuclear weapons in retaliation against an attack against space assets.

Future Policy and Diplomatic Initiatives

- As of the end of 2007, The U.S. and the USSR/Russia had launched more than 3,000 military satellites; the rest of the world had launched less than 100.
- As is the case with nuclear weapons, policy and diplomatic leadership in space is needed from America and Russia.

Some Possible Future Policy and Diplomatic Initiatives

- No further ASAT testing, i.e. a “CATBT.”
- No development or deployment of space-to-Earth attack weapons.
- No development or deployment of space-to-space attack weapons.
- Transparency and consultative measures, e.g. commercial space launch vehicles and payloads.
- No use of destructive methods against man-made space objects.
- No dedicated, ground-based ASATs on hair trigger alert.
- No first use of space attack weapons.

Conclusion

- Not since the development of the atomic bomb has the United States, Russia, and the international community had an equivalent opportunity and incentive to show leadership for restraint in the development of a new class of weapons, namely weapons in space.