United States Department of State
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ACTION MEMORANDUM FOR VICE PRESIDENT PENCE
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SUBJECT: National Security Strategy Issue "Renew Capabilities in Space" & Priority Action "Advance Space as a Priority Domain" Information Analysis and Recommendations

Overview

This Action Memorandum seeks to analyze the current progress for the National Security Strategy Issue: "Renewing Capabilities in Space" in relation to the priority action of "Advancing Space as a Priority Domain," (See Annex 1) as well as propose various short and long term recommendations to address shortcomings. Through addressing shortcomings, this Action Memorandum highlights the need for American space dominance for both our National Security and commercial success. Our future is characterized by a revitalized space race - one that we cannot afford to lose.

Recommendations

Based on analysis of this administration's actions for space we offer the following recommendations: *Short term (1-5 years):* 1) Offer tax breaks to private companies involved in space exploration, 2) Increase funding federal funding for NASA, 3) Increase Department of Defense funding specifically for ASAT capabilities. *Long term (5+ years):* 1) Establish a bipartisan committee under the National Space Council with the mission of developing a sustainable commercial and military strategic space plan.

Background

This administration has shown its support for renewing space capabilities and advancing space dominance by taking initiatives on matters the previous administration did not consider. For example, it announced the initiative to develop an independent military branch to be named the "Space Force" (See Annex 2) earlier this August, with its primary goal being to assert and maintain dominance in space.[1] The re-establishment of the National Space Council (NSC) after 24 years of inactivity by the President also demonstrates further support.[2] The President signed Space Policy Directive 1 a few months later urging for space programs to focus more on long term exploration and discovery.[2] Space Policy Directive 2 called for various levels of government to revise existing policies regarding commercial space flight.[3]

[1]https://www.defensenews.com/space/2018/08/09/space-force-will-be-6th-military-branch-by-2020-vice-president-pence-announces/
[2]https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-unveiling-america-first-national-space-strategy/
[3]https://www.whitehouse.gov/presidential-actions/space-policy-directive-2-streamlining-regulations-commercial-use-space/

In Space Policy Directive 1, the President proposed an increase in NASA's budget (See Annex 3) for Fiscal Year 2017[2]; Congressional approval consequently allocated 368 million dollars.[4] In 2018, NASA announced Lunar Surface Instrument and Technology Payloads would be flown to the moon on commercially-built lunar landers by 2020 to support future missions to Mars.[5] In addition, the Pentagon recently awarded more than 2 billion dollars in contracts to private companies to develop rockets capable of launching national security-related satellites.[6]

The U.S. is not the only country pushing for dominance is space; its primary competitors are Russia and China. Chinese President Xi Jinping opened space to the Chinese private sector in 2014, spurring dozens of Chinese rocketry startups to enter the commercial industry.[7] Both Russia and China have pursued the development of Anti-Satellite (ASAT - See Annex 4) weapons that could potentially undermine U.S. military capabilities in space.[8] (See Annex 5)

Analysis

While this administration has taken significant steps towards addressing the NSS Issue and Priority Action, it still has a long way to go before reaching its goals. The administration needs to take further steps to support innovation and American leadership in space. There has been no clear policy announced regarding retaliatory actions in the event of an attack on American space infrastructure by an Anti-Satellite (ASAT) weapon.

This administration regularly awards public-private contracts; however, more needs to be done in order to further stimulate American business growth in space. The U.S. economy will greatly benefit if American private businesses lead in the commercial space sector.

Additionally, while it seems that the administration supports space efforts, there is evidence of a lack of cohesion between space agencies and military branches that could hinder progress. For example, NASA and the President disagree on a timeline to explore Mars.[9] Additionally, the Pentagon and the President disagree on the creation of the Space Force.[10] Furthermore, the administration has not developed a sustainable strategic plan for American exploration and leadership in space.

While China's space goals are prepared years in advance and followed rigorously,[11] NASA's goals are heavily influenced by administration changes and yearly budget allocations. Considering the highly long-term nature of space missions, the US government needs to look towards the future and set long-range goals that are sustainable across administrations and independent of unpredictable annual budget fluctuations.

Conclusions and Recommendations:

Based on the problems and shortcomings addressed in the analysis, we suggest the following short and long-term recommendations. *Short term (1-5 years):* 1) Offer tax breaks to

[4]https://www.congress.gov/bill/115th-congress/senate-bill/442
[5]https://www.nasa.gov/feature/nasa-calls-for-instruments-technologies-for-delivery-to-the-moon
[6]https://www.washingtonpost.com/technology/2018/10/10/pentagon-awards-more-than-billion-contracts-national-security-rocket-launches/?utm_term=.2a3b886cafc9
[7]https://www.bloomberg.com/news/articles/2018-10-17/china-s-space-program-is-coming-for-elon-musk-and-jeff-bezos
[8]https://spacenews.com/u-s-intelligence-russia-and-china-will-have-operational-anti-satellite-weapons-in-a-few-years/
[9]https://www.theguardian.com/science/2017/apr/30/trump-mission-mars-nasa-space-flight
[10]https://www.washingtontimes.com/news/2018/aug/8/donald-trumps-space-force-meets-resistance-pentago/
[11]https://www.wired.co.uk/article/china-space-moon-base-mars-landing

private companies involved in space exploration, 2) Increase funding federal funding for NASA, 3) Increase Department of Defense funding specifically for ASAT capabilities. *Long term (5+ years):* 1) Establish a bipartisan committee under the National Space Council with the mission of developing a sustainable commercial and military strategic space plan.

Our short term recommendations are necessary for the United States to maintain dominance in space commercially and militarily. In 2015, Congress passed the U. S. Commercial Space Launch Competitiveness Act of 2015[12], which explicitly allowed U.S. citizens to engage in the commercial exploration and exploitation of space resources such as water and minerals. Short Term Recommendation 1 would further this law by offering a tax break to private companies involved in space exploration, as an incentive to explore and utilize space resources. Short Term Recommendation 2 is essential for the U.S. to pursue its goals of reaching Mars and returning to the Moon. NASA's research and missions provide the important backbone of all U.S. space operations. Short Term Recommendation 3 allows for the United States to develop ASAT capabilities. With China and Russia recently testing and developing ASAT weapons, the United States must demonstrate the capability of using ASAT weapons as well. This will be a form of deterrence against Russia and China using ASAT weapons, as they also rely heavily on space-based systems. Finally, due to the United States' historically poor long-term goal-setting record, we recommend that the National Space Council establish a bipartisan committee responsible for the mission of developing a sustainable commercial and military strategic space plan. A bipartisan committee with a range of ideologies and a stable budget would be significantly more effective at creating long-term goals because it would need to reach a consensus acceptable to many.

The Apollo missions introduced an unprecedented golden age in space exploration, research, and public interest.[13] The success of the Apollo 11 mission cemented the United States' position as the preeminent nation in space travel and exploration at that time. Furthermore, NASA budget levels in this time period reached record levels, peaking at 4.41% of the federal budget in 1966[14], compared to 0.47% in 2017.[15] While federal spending in space exploration has declined since 1969, public interest in the celestial frontier remains high, with 72% of respondents to a 2018 survey agreeing that it is essential that the U.S. remain a world leader in space exploration.[16]

There is no question that advances in space research, engineering, and exploration have directly benefited humankind. Advancements ranging from the Global Positioning System and related services, to the theoretical physics that suggest the origin of the Universe, have all been directly influenced by the prioritization of space as a domain of importance. The United States has traditionally been a leader in this field, but with foreign space agencies setting ambitious goals, such as the China's four-stage moon base program[17], the United States must not only re-establish dominance, but also break from the old norms and attract and cultivate even more private companies and innovators in the new space race.

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[12]https://www.congress.gov/bill/114th-congress/house-bill/2262/text
[13]https://history.nasa.gov/moondec.html
[14]https://www.theguardian.com/news/datablog/2010/feb/01/nasa-budgets-us-spending-space-travel
[15]https://www.congress.gov/bill/115th-congress/senate-bill/442
[16]http://www.pewinternet.org/2018/06/06/majority-of-americans-believe-it-is-essential-that-the-u-s-remain-a-global-leader-in-space/
[17]https://www.defenseone.com/technology/2018/10/chinas-moon-missions-could-threaten-us-satellites-pentagon/152084/?oref=d-channeltop

The Stars and Stripes was the world's first flag to fly on the Moon. With these goals and priorities in motion, the Moon will not be the last celestial body to bear our nation's flag.

Annex 1: National Security Strategy Issue "Renew Capabilities in Space" & Priority Action "Advance Space as a Priority Domain"

As stated in the National Security Strategy (NSS), the administration hopes to "Renew Capabilities in Space" so that the United States can maintain its leadership and freedom of action there. U.S. military and commercial sectors rely heavily on space-based systems. Our space dependence has been followed by a "democratization of space" and the emergence of more affordable space technology that affects American ability to respond adequately in conflict. As other countries gain the ability to target U.S. assets in space, this administration sees American freedom to operate in and access space as vital to national security. [18]

Through the NSS Priority Action of "Advancing Space as a Priority Domain," the administration seeks to use the re-established National Space Council to serve as a policy-advisory body to the President and to develop a strategy that "integrates all space sectors to support innovation and American leadership in space." The priority action realizes the importance of both a strong commercial and defense space strategy. Exploration and national security are both vital to American freedom of action in space. Renewal of capabilities in space through private-public partnerships, establishment of long term goals by government bodies, and the focus on space as a priority national security domain are ways in which to focus attention on this issue and priority action.

[18] https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf

Annex 2: Space force

What is it?

On August 9th, the administration announced an initiative to develop an independent branch of the military to be named the "Space Force" and to be established by as soon as 2020.[19] The primary goal of this division is to assert and maintain American dominance in space. An estimated $8 billion is to be requested over the next 5 years from Congress in order to jump-start this program.

Steps towards implementation

The creation of Space Force includes four major steps:

1. Creating a unified combatant lead by a four-star general
2. Creating an elite force of officers - the "Space Operations Force" - to provide expertise in times of conflict/crisis
3. Increasing space development agencies to procure space products
4. Establishing an assistant to the Secretary of Defense who oversees the expansion of the Space Force

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https://www.defensenews.com/space/2018/08/09/space-force-will-be-6th-military-branch-by-2020-vice-president-pence-announces/

Annex 3: NASA's Budget

Item	2017 Obama request	2017 Congress approved	2018 Trump request	2018 Omnibus
NASA TOTAL	$19,025	$19,653	$19,092	$20,736
SCIENCE				

[20]

Note: NASA totals given in millions

2017-2018 details

From 2016-2017, NASA's budget increased by $368 million, from $19.285 billion to $19.653 billion.[18] Legislation in 2017 passed for 2018's budget to be increased by $1.1 billion, to around $20.7 billion. The original proposal was to cut the budget, but this year's amount is almost tripled from the previous year.

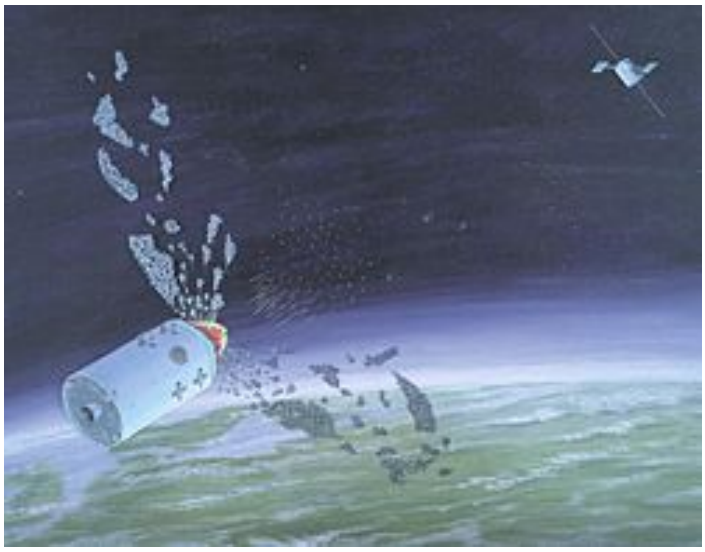
How much is it divided?

Science: $6.222 billion
Aeronautics: $685 million
Space Technology: $760 million
Exploration: $4.790 billion
Space Operations: $4.752 billion
Education: $100 million
Safety/Sec/Services: $2.827 billion
Const/Enviro: $562 million
OIG: $39 million

[20] http://www.planetary.org/blogs/casey-dreier/2018/20180322-fy18-omnibus.html

Annex 4: Anti-satellite Weapons (ASATs)

Anti-satellite Weapons are space weapons designed to incapacitate or destroy satellites for strategic military purposes. [21]

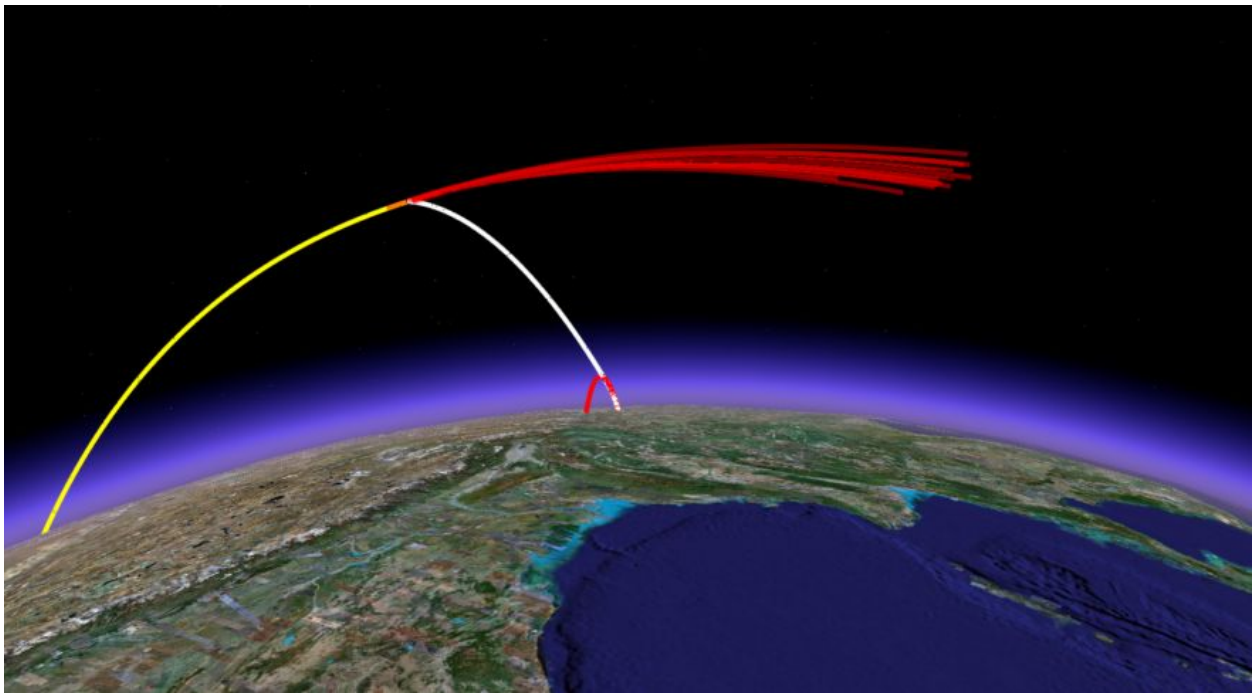


Historic Uses:

As of now, there has been no ASAT system used in warfare; however, there has been instances where several nations, such as China, have shot down their own defunct satellites as a demonstration of their capabilities.

[21] https://en.wikipedia.org/wiki/Anti-satellite_weapon

Annex 5: Chinese and Russian Anti-Satellite Testing

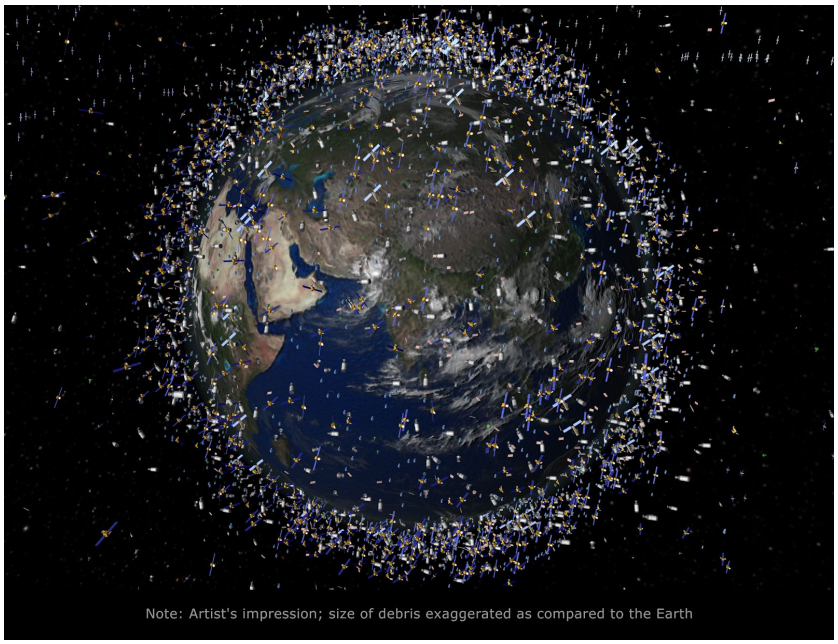


In 2018, Russia carried out its sixth test of its ASAT system.[22] Additionally, China performed an Anti-Satellite test in 2007 that successfully collided with a non-operational Chinese weather satellite.[23] This incident not only demonstrated the Chinese ASAT capability, it also produced the largest instance of space debris in history.[24] As noted by the Joint Staff intelligence (J-2), these technologies could have the capability to attack low-earth orbit satellites by 2020.[25]

[22] https://thediplomat.com/2018/04/russia-conducts-new-test-of-nudol-anti-satellite-system/
[23] https://swfound.org/media/9550/chinese_asat_fact_sheet_updated_2012.pdf
[24] https://swfound.org/media/9550/chinese_asat_fact_sheet_updated_2012.pdf
[25]https://freebeacon.com/national-security/pentagon-china-russia-soon-capable-destroying-u-s-satellites/

Annex 6: Low Earth Orbit (LEO)

Low earth orbits (LEO) are systems of satellites, orbiting around 400 to 1000 miles above earth's surface, that are mainly used in telecommunication.[26] Email, video conferencing and paging are some examples of the satellites' uses.



[27]

Why it matters

LEO-based telecommunication systems allow for satellite telephone service in territories where it would not be beneficial or even impossible to lay land lines. This is only one example of how low earth orbit systems enable extend a country's capabilities.

LEO satellites are also important to the future of military capabilities as they offer better redundancy, can be replaced more easily, and are smaller and less expensive than MEO or GEO satellites.

[26] https://www.techopedia.com/definition/8044/low-earth-orbit-leo
[27] https://www.universetoday.com/85322/what-is-low-earth-orbit/