

REACTING TO MAJOR SPACE EVENTS AT OR BELOW GEOSTATIONARY ORBIT

—After Action Report—



BEHIND THE EIGHT BALL

*If we are a leader, why
aren't we leading?*

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**AMERICAN FOREIGN
POLICY COUNCIL**

***REACTING TO MAJOR SPACE EVENTS AT OR BELOW
GEOSTATIONARY ORBIT***

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The views, opinions, and recommendations expressed in this report are those of the authors and do not necessarily reflect the official policy or position of any government agency or individual participant. Participants' involvement does not imply endorsement of all contents.

EXECUTIVE SUMMARY

This report details the outcomes of a series of high-stakes, seminar-style wargames conducted by a simulated National Space Council (NSpC) to address potential near-term space-related scenarios that could significantly impact U.S. public perception, resourcing, and policy.

Designed to prepare U.S. leaders for possible space occurrences over the next two to three decades, this workshop engaged an assembled team of players representing various U.S. governmental and strategic positions. Participants, drawn from a cross-section of U.S. space leadership including military, civilian, private, and academic sectors, engaged in robust discussions to anticipate potential concerns, tensions, and cross-sector impacts of future developments in space.

The simulations focused on scenarios that might plausibly confront the United States within the next two administrations. Several of the scenarios were direct challenges by the People's Republic of China (PRC) to U.S. leadership in space. In all cases, the scenarios occurred within the context of U.S.-China strategic competition and carried with them strategic implications for U.S. space policy and international relations. Scenarios ranged from confrontational space incidents, like the downing of a U.S. satellite, to strategic technological deployments by China, such as space-based solar power (SBSP) stations and space nuclear reactors. The workshop was geared toward developing strategic responses that balanced defense, diplomacy, and public communication while considering the long-term geopolitical landscape and the fast-evolving arena of space technology and exploration. Below is a summary of the scenarios, a real-world rationale for their selection, and NSpC participants' recommendations:

(Please note that the recommendations were developed during a high-pressure, time-constrained simulation designed to emphasize the challenges of developing real-time responses to an actual crisis. These recommendations represent the consensus of the expert participants under these conditions. However, a more thorough analysis that benefits from additional time and consideration of these and other potential crises will appear in a forthcoming book.)

Scenario / Selection Rationale	NSpC Participants' Recommendations
<p>Scenario 1: Incident in the Cosmos — The Downing of a U.S. Satellite</p> <p><u>Public aware of an attack on a U.S. satellite</u></p> <p>Selection Rationale: According to a March 3, 2023, article in <i>Space.com</i>, “the Chinese satellite TJS-3 has been inspecting other countries’ assets in geostationary orbit. ... [The satellite] was sent up into geostationary orbit in late 2018.”</p>	<ol style="list-style-type: none"> 1. Publicly defend, privately respond to China considering trade. 2. Brief Congress via NSpC. 3. Develop multidomain response. 4. Communicate measured response globally. 5. Create policy; consult allies; share multilayered UN plan.

Scenario / Selection Rationale	NSpC Participants' Recommendations
<p>Scenario 2: The Red Celestial Guard—PRC's Co-orbital ASAT Constellation <u>PRC fields an operational co-orbital anti-satellite (ASAT) constellation</u> Selection Rationale: According to a February 27, 2023, Cybernews article, "Chinese researchers from the People's Liberation Army's Space Engineering University in Beijing say they're planning to build a powerful constellation network consisting of exactly 12,992 satellites to compete with Elon Musk's SpaceX program."</p>	<ol style="list-style-type: none"> 1. Partial moratorium; diversify defense; negotiate norms. 2. Ally with NATO, Asia against escalation. 3. Consider covert options. 4. Invest in artificial intelligence, space, and science and technology long term. 5. Promote rules; deter via messaging, debris removal, and targeted response to ASAT.
<p>Scenario 3: Orbital Tensions—Satellite Sabotage Showdown <u>Commercial vs. commercial aggression (e.g., Starlink vs. PRC deliberate interrupting)</u> Selection Rationale: According to a February 24, 2024, PC Magazine article, "Researchers at China's Space Engineering University—which operates under the People's Liberation Army—floated the recommendation in a new paper discussing 'countermeasures' against Starlink."</p>	<ol style="list-style-type: none"> 1. Align with allies; ensure resilient space systems. Emphasize commercial companies' value; hold hearings for response steps: restore Starlink, conduct cyber response, demonstrate attack, collaborate. 2. Sanction Skynet; use Starlink to open internet in China as deterrence. 3. Respond via U.S. Cyber Command; secure cyber mechanisms. 4. Declare space assets as critical infrastructure; showcase resilience and capabilities. 5. Convey severity of satellite attacks as escalation.
<p>Scenario 4: Celestial Vanguard—PLA's Spaceplane Squadron Emergence <u>PLA Strategic Support Force declares squadron of spaceplanes operational</u> Selection Rationale: China has been testing spaceplane concepts, but these experiments have not added up to an operational capability. However, China has proved its ability to move rapidly from experiment to operations.</p>	<ol style="list-style-type: none"> 1. Develop U.S. capability; intercept, strike, deter, defend; involve companies. 2. Dialogue with China; state consequences. 3. Utilize low Earth orbit research; urge China's participation. 4. Gather intelligence; apply pressure. 5. Frame PLA squadron as warfighting tool.
<p>Scenario 5: Solar Sentinel—PRC's Leap in Space-Based Power <u>PRC 500 kilowatt solar power station first-light in low Earth orbit</u> Selection Rationale: China is well aware of the benefits to space-based solar power (SBSP) and are planning to conduct a test in 2028.</p>	<ol style="list-style-type: none"> 1. Build 100-megawatt system; invest in interagency effort for climate and diplomacy. 2. Collaborate with China on SBSP for global use. 3. Create public-private partnership for U.S. SBSP. 4. Pursue climate resilience and renewable energy with allies. 5. Consider Department of Defense investments; assess laser-based SBSP security risks.

Scenario / Selection Rationale	NSpC Participants' Recommendations
<p><i>Scenario 6: Celestial Core—PRC's First Space Nuclear Reactor</i> <u>PRC tests first space nuclear reactor</u> <i>Selection Rationale:</i> <i>This is a future that the U.S. should prepare for because the Chinese have plans for a megawatt-powered spacecraft.</i></p>	<ol style="list-style-type: none"> 1. Message public on nuclear propulsion investment. 2. Prioritize multi-megawatt nuclear systems funding. 3. Develop bipartisan space vision with nuclear power. 4. Collaborate with allies; exploit soft power advantage. 5. Update SPD-6; develop nuclear capabilities for exploration and military use.

Strategic recommendations that apply universally across all situations presented:

1. **Invest in Critical Technologies for Space Leadership**
 - Prioritize space nuclear power and propulsion, space-based solar power satellites, and spaceplanes.
 - Allocate resources to accelerate development and maintain U.S. preeminence in these key areas.
2. **Achieve U.S. Primacy in Norm-Setting Demonstrations**
 - Adjust goals, schedules, and funding to ensure U.S. accomplishments precede those of competitors, particularly China.
 - Identify and prioritize high-profile space missions that shape public perceptions and international norms.
3. **Maintain Readiness to Deploy Countermeasures and Equivalent Systems**
 - Develop a robust industrial base and rapid manufacturing capacity to deploy operational systems within 12 months if needed.
 - Ensure U.S. research and development keep pace with potential adversaries' prototype testing and demonstrations.
 - Invest in effective countermeasures and defensive systems to neutralize threats and preserve U.S. space capabilities.

PROJECT OVERVIEW

The AFPC Space Policy Initiative co-directors have designed a series of workshops to examine near-term scenarios that could have a significant *psychological impact on public perceptions* of space, and thus on resourcing and policy. The aim of the project is to offer options, add context, and prepare U.S. leaders for space occurrences over the next two to three decades. For these workshops, the principal investigators (PIs) have assembled teams of players who represent surrogates of a National Space Council (NSpC) and are presenting them with a set of scenarios that might simultaneously appear in the media, forcing players to shape a U.S. government response. This process will allow the PIs to anticipate concerns, tensions, and cross-sector impacts of future developments in space. During the workshops, each space scenario is discussed, with a focus on addressing two primary questions:

1. How do we anticipate the situation being framed in the public media, and what sort of action is likely to be demanded from public officials?
2. What options exist for the United States, and which option is selected and why?

Our aim is for these discussions to help policymakers make better decisions. By *anticipating what political pressures will be felt by U.S. government policymakers*—including how the public, the press, Congress, allies, and adversaries may respond—and *examining potential responses* for the U.S. (in new policies, executive orders, dedicated strategies, national-level guidance), we hope this series of workshops will help prepare U.S. policymakers for a number of foreseeable scenarios they may encounter—before those events occur—and arm them with the foresight and policy options needed to steer the wisest course.

Methodology

Given the timeline of the scenarios that the workshop encompassed and the nature of the objectives, a seminar-style wargame was chosen. Six scenarios with the People's Republic of China as the first mover were created and given to the players in advance of the workshop. The players, collectively forming the National Space Council, were given an hour to formulate and brainstorm different ideas and appropriate reactions to the scenario. No barriers to communication were implemented, though the wargame's inherent speed challenges the players to remain as concise as possible. Additionally, injections with headlines and various new incidents were interspersed throughout discussion time. At the end of the hour, participants were asked to present and reason out their chosen course of action.

To mitigate groupthink among the participants, one “External Press Agitator” was placed into the group and directed to challenge or question the group's decision-making. Without a red team to react to the players' actions, the press agitator was the next best option to encourage discussion of the possible consequences of their actions. To adjust for political bias during the recommendations, the administration for the NSpC assumed a Republican administration for the first three scenarios and a Democratic administration for the following three scenarios, each with a divided U.S. House of Representatives.

Participants for the workshop were selected for their deep substantive knowledge on U.S. space activities or policy along with their likelihood to serve at a senior level in future administrations. The participant list includes senior space leaders across the military, civilian,

private, and academic sectors (see participant list for names and affiliations). The workshop follows Chatham House rules, so as to encourage brainstorming and experimentation.

The following participants formed the simulated NSpC for the first workshop:

- | | |
|--------------------------------------|--|
| 1. Vice President | 8. Assistant to the President for Domestic Policy |
| 2. Secretary of Defense | 9. Director of the Office of Science and Technology Policy |
| 3. Director of National Intelligence | 10. CCP Subject Matter Expert |
| 4. Secretary of Commerce | 11. White House Press Secretary/ External Press Agitator |
| 5. Secretary of State | 12. Presidential Policy Advisor |
| 6. NASA Administrator | |
| 7. Secretary of Energy | |

Workshop 1 Introduction

For the first workshop, focus was placed on reacting to major space events at or below geostationary orbit. *China has outlined a grand vision for space* and over the next two decades *has plans to*—among other milestones—*unveil incrementally improved space-based solar power satellites, a space nuclear reactor, and a squadron of spaceplanes*, and to develop *a mature operational co-orbital anti-satellite constellation*. Each of these scenarios carries strategic significance for U.S. policymakers, and this workshop provided an opportunity to analyze them.

The six scenarios contained herein were constructed as a result of recent news headlines that have demonstrated an adversary capability or development toward a capability that could be destabilizing and elicit a reaction from the U.S. government. After the first workshop, participants universally agreed that the U.S. is currently “behind the eight ball” with regard to advancements in space—despite holding a massive head start and benefitting from the advent of reusable rockets. In comparison to China, participants were emphatic that *there is a clear and decisive disparity between the two nations’ visions and strategies for space*. After walking through each scenario and realizing that certain near-term developments could provide China with a decided strategic advantage, it became imperative that the U.S. should invest in certain areas to avoid having to face the daunting headlines experienced in the six scenarios. The report contains a description of each scenario, the rationale for the specific scenarios’ selection, a summary of the participant discussion, and the recommendations from the NSpC players, followed by a summary of the key takeaways and recommendations from the whole exercise. Finally, an appendix is attached containing the assessment, concerns, and recommendations of each NSpC participant along with the discussion highlighting the group’s tensions and options considered for each scenario.

Scenario 1: Incident in the Cosmos—The Downing of a U.S. Satellite

At 0600 EST, the U.S. Space Surveillance Network detected an anomalous event: Satellite USA-271, a key space domain awareness satellite in geosynchronous orbit, suffered a sudden and catastrophic failure. Preliminary telemetry suggests it was not an accident. Within minutes, amateur satellite watchers on social media began reporting a bright flash observed near the satellite's last known position, followed by a noticeable debris cloud. Analysis of open-source data indicates the presence of a foreign “inspector satellite” that had maneuvered close to USA-271 in the hours before the incident.



The incident occurs amid tense geopolitical negotiations. The adversary nation, while not overtly claiming responsibility, broadcasts a stern warning about the militarization of space and the consequences of encroaching on what it claims as its strategic orbital territory. Allies express concern and seek a collective response, wary of the precedent such an aggressive act could set. The destruction of USA-271 exposes vulnerabilities in U.S. space assets and has ripple effects on global communications and surveillance capabilities. There is an immediate need for strategic communication to assure international partners of the U.S.'s ability to maintain space domain awareness and defend its assets.

As the news outlets pick up the story, there's a swift public outcry, drawing parallels to the 2023 Chinese balloon incident. Hashtags like #SpaceAggression and #SatelliteGate dominate online discourse. The public demands a response, fearing that their data security and communications infrastructure are at risk. The President has asked the Vice President to convene the National Space Council to provide options and recommendations for how the U.S. should respond, both immediately and in the long term, including a “get-well plan” with resource implications.

Scenario Selection Rationale

While recently the public has been made aware of close passes or inspections by adversary satellites, they have not yet been made aware of a physical attack on a U.S. satellite. Were such an event to become public, it would likewise trigger attention and outrage similar to the violation of U.S. airspace by the Chinese balloon in early 2023. An article from March 3, 2023, in Space.com demonstrates the context for this scenario. According to the article, “the Chinese satellite TJS-3 has been inspecting other countries’ assets in geostationary orbit. ...[The satellite] was sent up into geostationary orbit in late 2018. It then released a small subsatellite, possibly to help test TJS-3’s capabilities.”¹ The Space.com article continues, stating that “orbital data reveals that TJS-3 has been making close approaches to American satellites in recent months.”²

¹ Andrew Jones, “A Chinese Spacecraft Has Been Checking Out US Satellites High Above Earth,” Space.com, March 3, 2023, <https://www.space.com/chinese-spacecraft-tjs-3-inspecting-us-satellites>

² Jones, “A Chinese Spacecraft Has Been Checking Out US Satellites High Above Earth”; for additional reading on space war tactics read, Colin Clark, “US, China, Russia Test New Space War Tactics: Sats Buzzing, Spoofing,

The Chinese are already capable of inflicting damage to U.S. space assets, but to date no Chinese physical attack using an inspector satellite has been publicly disclosed.

Discussion Summary

1. **Response Dilemma:** Council members debated between a forceful response to deter further Chinese aggression and a cautious approach to avoid escalation, given the significant U.S. reliance on space assets and the intricate industrial ties with China.
2. **Military vs. Diplomatic Actions:** There was a split between advocating for military responses, including anti-satellite attacks and maneuvers by the U.S. Space Force, and pushing for diplomatic strategies like forming an international coalition to enforce space norms and potentially sanction China.
3. **Communication and Strategy:** Advisors were torn between the need for public transparency and strategic secrecy, opting to keep the President distanced until more information was available, while emphasizing the necessity of defensive actions without escalating the situation publicly.

NSpC Participants' Recommendations

Recommendation 1: Assume a U.S. defensive posture (say this publicly). Have a quiet, rather offensive response that only China hears. This response considers U.S. trade relations with China. The U.S. will defend its assets in space and will not allow any adversary nation to destroy its assets in space. *The Chief of Space Operations authorizes a low Earth orbit surveillance satellite to accomplish space domain awareness.*

Recommendation 2: Host a briefing on the Hill; send NSpC staffers to brief the members of Congress on the situation.

Recommendation 3: Formulate a response that is not limited to the space domain.

Recommendation 4: Host a press conference and press releases (for a global audience) outlining the measured steps the administration is going to take in response to the event.

Recommendation 5: Develop concrete policy steps. Consult with our allies and provide them with the U.S. multilayered response plan. *U.N. level (coalition).*

Spying,” *Breaking Defense*, October 28, 2021, <https://breakingdefense.com/2021/10/us-china-russia-test-new-space-war-tactics-sats-buzzing-spoofing-spying/>

Scenario 2: The Red Celestial Guard—PRC’s Co-orbital ASAT Constellation

In the year 2026, the People’s Republic of China (PRC) has rapidly deployed a fully operational constellation of approximately 260 co-orbital anti-satellites (ASATs) to low Earth orbit (LEO).

Unlike the PRC’s previous direct-ascent ASAT systems and experimental co-orbital counterspace activities, this deployment involves a constellation of co-orbital ASATs designed for precision targeting and disruption of U.S. and allied space assets, as evidenced by the selection of orbital planes and altitudes that provide rapid access to the National Reconnaissance Office and the U.S. Space Force Proliferated Warfighter Space Architecture. These satellites are equipped with advanced rendezvous and proximity operations capabilities, including robotic arms and dual-mode propulsion systems enabling prolonged, rapid, and precise orbital maneuvers. The onboard satellite sensors of the co-orbital ASAT constellation enhance the PRC’s in-space space domain awareness capabilities. These systems provide real-time tracking, monitoring, and identification of key U.S. and allied space assets, enabling precise targeting and coordinated ASAT activities.



The deployment of the co-orbital ASAT constellation represents an unambiguous weaponization of space by the PRC. It signifies a significant shift in China’s space policy and capabilities, moving beyond experimental activities to fielding an operational and potentially aggressive space-based system. The U.S. and its allies lack an equivalent deterrent to counter the threat posed by the PRC’s co-orbital ASAT constellation. This capability allows the PRC to potentially disrupt or disable critical U.S. and allied space assets with precision. The international community expresses deep concerns about the PRC’s actions, as the deployment of an operational co-orbital ASAT constellation raises questions about the weaponization of space, potential space debris generation, and the need for global space security agreements. The President has asked the Vice President to convene the National Space Council to provide options and recommendations for how the U.S. should respond, both immediately and in the long term, including a “get-well plan” with resource implications.

Scenario Selection Rationale

Until now, the PRC has fielded only direct-ascent ASATs and experimented only with on-orbit co-orbital counterspace systems. It has, however, demonstrated its ability to rapidly deploy approximately 260 reconnaissance satellites to LEO. Were China to deploy an equivalent-sized operational co-orbital counterspace constellation and associated in-space space domain awareness, it would be an unambiguous weaponization of space and represent a significant threat to U.S. systems for which the U.S. had no equivalent deterrent. The capability for rapid deployment and plans for a large constellation are underway, as evidenced in a *Cybernews* article stating, “Chinese researchers from the People’s Liberation Army’s Space Engineering University in Beijing say they’re planning to build a powerful constellation network consisting of exactly 12,992 satellites to compete with Elon Musk’s SpaceX program. ... But—this is where it gets interesting—*China’s satellites will be designed to detect, identify, track and catalog the details belonging to each and every satellite in the Starlink fleet.* What’s more, the *satellites will be equipped with new AI weapons, including lasers and high-powered microwaves, developed for*

*use to destroy Starlink satellites that pass over China and other sensitive regions” (emphasis added).*³

Discussion Summary

1. **Strategic Implications and Response:** The council focused on the need to deter China, reassure allies, and protect U.S. space assets in light of China’s growing ASAT capabilities. They explored China’s intent, particularly regarding regional security and the threat posed to Taiwan, recognizing that the U.S. needs a well-calibrated response that also considers the long-term strategic landscape.
2. **Importance of International Norms:** There was significant discussion on establishing and adhering to international norms and legal frameworks in space, drawing parallels with nuclear arms race precedents. The possibility of arms limitation talks was suggested as a strategy to prevent an escalation similar to the Cold War arms race.
3. **Diverse Response Strategies:** Various responses were proposed, including resuming ASAT testing to showcase U.S. capabilities, using non-kinetic measures such as providing uncensored internet access in China via satellites, and forming an international coalition to apply economic pressure and establish new legal norms for space activities.

NSpC Participants’ Recommendations

Recommendation 1: Execute a combination of moratorium with some level of assurance, but do not reveal all U.S. capabilities. Establish a diversified ability in different orbits; defend ourselves (the U.S.). China’s deployment is destabilizing, and the U.S. must create a norm-disrupter narrative. Negotiate further clarity on international norms of behavior with regard to destroying China’s capabilities.

Recommendation 2: This Chinese move is escalatory, and there has to be a coalition, forming alliances with NATO and Asian allied space partners.

Recommendation 3: Consider using the available covert options.

Recommendation 4: Invest in AI, space-based technology, and science and technology in the long term (national security and science).

Recommendation 5: Constant messaging based on a rules-based international order (similar to the international consensus on approach to Chinese militarization of the South China Sea). It’s an opportunity to *deter and deny China*. Push through Congress an orbital debris removal capability. Utilize both covert and overt capabilities. Without creating debris, the response can be directly tied to China’s ASAT capabilities.

³ Stephanie Schappert, “China Plans to Crush Starlink With Constellation of Satellites,” *Cybernews*, February 27, 2023, <https://cybernews.com/tech/china-plans-satellite-constellation-starlink-rivalry/>

Scenario 3: Orbital Tensions—Satellite Sabotage Showdown

In a sudden and alarming development, a series of malfunctions occurs among the satellites of Starlink, the renowned space-based internet service provider. Preliminary investigations suggest a pattern of sabotage: Several satellites exhibit signs of cyberattacks, with the digital fingerprints suggesting the involvement of a major Chinese commercial space corporation, SkynetComm. This act of aggression marks a new frontier in corporate warfare, as space becomes the battleground for



commercial dominance. The proliferation of private space companies has led to fierce competition for orbital slots and frequencies. SkynetComm, supported indirectly by the People's Republic of China (PRC), has been struggling to compete with the expansive and successful Starlink network. In an attempt to gain a competitive edge, SkynetComm resorts to cyber and electronic warfare tactics in space. The company employs a dual strategy: launching cyberattacks to degrade Starlink's network performance and deploying small satellites equipped with electronic warfare technology to interfere with Starlink's signal directly in orbit. The sabotage is covert but effective, leading to widespread service outages and a significant loss of revenue for Starlink. The situation escalates when confidential documents leaked to the media reveal SkynetComm's involvement, suggesting a possible state-sanctioned economic warfare strategy. The sabotage acts as a wake-up call for the global community on the vulnerabilities of critical space infrastructure and the potential for commercial entities to disrupt international stability. The revelation of this space skirmish causes public alarm and prompts broader discussions on the militarization of commercial space enterprises. The world has grown accustomed to hearing about commercial launches and space exploration achievements, but the idea of companies engaging in sabotage or dirty tricks among the stars is entirely new. The perceived attack on a U.S. corporate asset by a foreign company triggers calls for government action and protection. The President has asked the Vice President to convene the National Space Council, to provide options and recommendations for how the U.S. should respond.

Scenario Selection Rationale

Various U.S. officials have described space as a “wild West” with few rules, poor visibility, and no law enforcement. Historically, corporations beyond legal recourse have resulted in “self-help,” employing dirty tricks and sabotage against their competitors and hiring their own private security forces. Such behavior in space, however, would be novel, and likely to shock the public. Moreover, if this occurred between companies of two adversarial states, they might be drawn into the conflict. These ideas are already being considered as “a group of Chinese researchers is suggesting China launch its own satellite constellation to ‘suppress’ SpaceX’s Starlink system. Researchers at China’s Space Engineering University—which operates under the People’s

Liberation Army—floated the recommendation in a new paper discussing ‘countermeasures’ against Starlink.”⁴

Discussion Summary

1. **Economic Focus and Response:** The council viewed the incident as primarily an economic threat, emphasizing the need for cyber defense, public reassurance, and diplomatic isolation of the aggressor. The attack’s impact on commercial satellite operations and economic security highlighted the necessity for a strategic and cautious economic response over a military one.
2. **Private-Sector Involvement and Regulation:** Concerns were raised about private companies like SpaceX potentially escalating conflicts independently, with Elon Musk’s readiness to launch countermeasures prompting discussions of stronger regulatory oversight and clearer guidelines for private-sector engagement in national security.
3. **Diplomatic and Economic Measures:** The debate included discussions on implementing measures like unfettered internet access for Chinese citizens or blocking Chinese investments as economic deterrents. There was also consideration of international sanctions against the Chinese entity believed responsible, balancing between projecting strength and avoiding actions that could trigger severe retaliation.

NSpC Participants’ Recommendations

Recommendation 1: The U.S. has to be aligned with its allies and ensure that space systems are resilient. Specific steps: Make clear that commercial companies are vital to U.S. infrastructure and a value addition to our global standing (through messaging). The House Armed Services and Commerce committees must hold hearings to develop actual steps for a resilient U.S. response. Steps:

1. Restore Starlink services.
2. Conduct a cyber response to Skynet; based on a presidential order.
3. U.S. demonstration attack against these on-orbit assets (legal mechanisms), to deter further Chinese attacks on U.S. commercial companies.
4. Interagency collaboration.

Recommendation 2: Economic sanctions should be imposed on Skynet. Use Starlink to open the internet to China (which could be seen as a regime attack) as the response to a hostile action by a Chinese actor to provide an overall deterring effect.

Recommendation 3: Respond using strong U.S. cyber capabilities through U.S. Cyber Command. Work to get the cybersecurity aspects secure with actual mechanisms.

Recommendation 4: Declare space assets like Starlink as critical infrastructure *[show the U.S. can do that]*, and make that message clear. We have resilience (defend, demonstrate, deter) and possess several layers of capabilities (public-private partnership).

Recommendation 5: Attack on U.S. satellites would mean escalation for China. The U.S. will take that very seriously.

⁴ Michael Kan, “Researchers Suggest China ‘Suppress’ Starlink Using Own Satellite Constellation,” *PC Magazine*, February 24, 2024, <https://www.pcmag.com/news/researchers-suggest-china-suppress-starlink-using-own-satellite-constellation>

Scenario 4: Celestial Vanguard—PLA's Spaceplane Squadron Emergence

China has been quietly testing and refining spaceplane technology and has now moved to operationalize a squadron with alarming speed. The People's Liberation Army (PLA) makes a historic announcement confirming the formation of the "Celestial Vanguard," an operational squadron of advanced spaceplanes. Unlike conventional satellites, these spaceplanes boast rapid deployment and versatile mission profiles, and they have the potential for direct action in space or terrestrial domains. The spaceplanes are capable of executing a variety of missions, including on-demand satellite deployment, repair, and potentially deorbiting enemy satellites. They can conduct reconnaissance over global hotspots and, most provocatively, are believed to possess the capability for precision orbital strikes. The Celestial Vanguard represents a new class of military asset, blurring the lines between aerospace and space dominance.



The PLA Strategic Support Force (SSF) conducts a demonstration, with one of the Celestial Vanguard spaceplanes completing a mission profile that includes maneuvers over key global military installations before making a calculated landing in an international waters zone close to the American hemisphere. The maneuver is perceived as a display of the spaceplane's reach and a not-so-subtle hint of its strike capabilities. The Celestial Vanguard squadron's emergence signals a potential shift in global strategic power, particularly in the space domain, where the U.S. has historically maintained superiority. The news of the operational spaceplane squadron and its demonstration of power projection stirs intense public debate and concern. Comparisons are made to the Cold War-era anxieties about nuclear-capable bombers and intercontinental ballistic missiles. Allies express concern over the power projection capabilities of the Celestial Vanguard. The President has asked the Vice President to convene the National Space Council to provide options and recommendations for how the U.S. should respond, both immediately and in the long term, including a "get-well plan" with resource implications.

Scenario Selection Rationale

Spaceplanes have very different operational utility than satellites, enabling responsive space access, difficult-to-predict counterspace capabilities, and even the potential for orbital bombardment. China has been testing spaceplane concepts, but these experiments have not added up to an operational capability.⁵ The U.S. has also only been experimenting. However, China has proved its ability to move rapidly from experiment to operations. The fielding of a spaceplane squadron would likely create a perception that the U.S. is significantly behind and offer the Chinese decided military advantages in space conflicts.⁶ Were it to successfully demonstrate a

⁵ Andrew Jones, "China's Spaceplane Conducted Proximity and Capture Maneuvers With Subsatellite, Data Suggests," *Space News*, May 11, 2023, <https://spacenews.com/chinas-spaceplane-conducted-proximity-and-capture-maneuvers-with-subsatellite-data-suggests/>

⁶ Namrata Goswami and Peter Garretson, "The Strategic Implications of China's 'Divine Dragon' Spaceplane," *The Diplomat*, January 12, 2024, <https://thediplomat.com/2024/01/the-strategic-implications-of-chinas-divine-dragon-spaceplane/>

landing capability in the American hemisphere with the same system, this would alarm the public with a potential novel mode of power projection or strike capability.

Discussion Summary

1. **Strategic Reassessment and Deterrence Concerns:** The potential for Chinese spaceplanes to carry nuclear weapons as a Fractional Orbital Bombardment System (FOBS) led to concerns about them being a platform for surprise attacks, prompting calls for a reassessment of U.S. strategic, operational, and tactical policies. This includes the need to enhance satellite surveillance, ground-based interceptor systems, and on-orbit capabilities—with an estimated expenditure of around \$150 billion.
2. **Opportunity for Technological and Diplomatic Leadership:** While the defense perspective highlighted the threats, other views suggested the spaceplanes could be a catalyst for U.S. advancements in spaceplane technology, potentially leading to a modern-day Manhattan Project for space. Diplomatically, the U.S. might engage more robustly in the Western Hemisphere to counter Chinese influence, leveraging international bodies like the U.N. Security Council with support from allies.
3. **Public and International Communication Needs:** The mixed responses from the American public and the need for reassurance among allies, such as NATO and the Five Eyes partners (Australia, Canada, New Zealand, the United Kingdom), highlighted the importance of clear communication strategies. This involves balancing domestic and international messaging to maintain public support and ensure allied confidence in U.S. commitments and capabilities in space.

NSpC Participants' Recommendations

Recommendation 1: Build U.S. military capability to respond to China's spaceplane capability. Defend the American people with a means of retaliation, but by acting in self-defense. To address the imminent threat, current Aegis capabilities can be used to target and intercept the Chinese spaceplanes—developing methods for preemptive strikes (space domain awareness, targeting, and new interception methods) could cost between \$100 and \$200 billion. Long-term: interdict munitions from this kind of capability. Ability to deploy and move (deterrence capability) in addition to defense. Utilize commercial companies like NorthStar for space situational awareness; build defensive ground-based interceptors, but lasers could also be used to avoid creating significant debris.

Recommendation 2: There is an opportunity to call for dialogue with China and to state the consequences of the spaceplane squadron deployment.

Recommendation 3: Utilize U.S. spaceplane low Earth orbit research and urge China to do something similar (message from the scientific community).

Recommendation 4: Determine why the spaceplane landed in Venezuela, gather intelligence on what China is doing there, and put pressure on the Venezuelan regime.

Recommendation 5: PLA declared an operational squadron; so the U.S. needs to build the narrative that this is a warfighting capability.

Scenario 5: Solar Sentinel—PRC’s Leap in Space-Based Power

This scenario unfolds in a world where the pursuit of clean and sustainable energy has extended beyond our planet’s boundaries. The concept of space-based solar power (SBSP) stations, harnessing the Sun’s energy in orbit and transmitting it to Earth, has become a symbol of innovation and ambition. In 2028, the People’s Republic of China (PRC) successfully achieved “first-light” for a 500 kilowatt (kW) “Solar Sentinel” solar power station in low Earth orbit (LEO). This represents a monumental leap in space-based energy technology, as most high-power communication satellites typically operate within the range of 5–20kW. The PRC’s achievement is nothing short of a technological marvel. This 500kW directed-energy platform in LEO, primarily designed for microwave power beaming, presents several significant implications. The Solar Sentinel’s high energy output makes it a candidate for a range of applications, from high-power communication and space-based industry support to potential directed-energy systems, capable of power beaming to terrestrial or orbital receivers with unprecedented efficiency. The launch and activation of the Solar Sentinel is a widely publicized event, with China showcasing it as a milestone for peaceful space development. However, military analysts worldwide quickly pick up on its potential implications for derivative space-based directed-energy weapons, which could theoretically target drones, satellites, or other assets. The U.S. and its allies must consider the balance of power in space and the possible need for similar capabilities to ensure parity and deterrence. The dual-use nature of the Solar Sentinel poses a strategic dilemma in differentiating between civilian and military space assets. The American public, on becoming aware of the Solar Sentinel’s power capabilities, expresses concern over the potential militarization of space. The President has asked the Vice President to convene the National Space Council to provide options and recommendations for how the U.S. should respond, both immediately and in the long term, including a “get-well plan” with resource implications.



Scenario Selection Rationale

China has an announced goal of a 500kW solar power station in 2028. This station represents an extremely consequential capability. Currently only the International Space Station has 100kW, with most high-power communication satellites being in the range of 5–20kW. The ability to construct a 500kW platform is significant, as most terrestrial military lasers are in the range of 30–100kW, and even 15kW lasers can shoot down drones. Even if purely for microwave power beaming, a 500kW directed-energy platform in LEO that orbits overhead like Sputnik is likely to raise concerns among the American public. China is well aware of the benefits to space-based solar power and is planning to conduct a test in 2028.⁷

⁷ Stephen Chen, “China Plans to Start Building First-Ever Solar Power Plant in Space by 2028,” *South China Morning Post*, July 7, 2022, <https://www.scmp.com/news/china/science/article/3180627/china-brings-forward-plans-space-solar-power-plant>; Andrew Jones, “China Aims for Space-Based Solar Power Test in LEO in 2028,”

Discussion Summary

1. **Technological and Security Implications:** The discussion highlighted the Solar Sentinel’s dual capabilities, focusing on the potential for high-power communication and directed-energy applications like space-to-space power beaming and space-based laser systems. The feasibility of different energy transfer systems and the potential weaponization of such technology raised concerns about international and public reassurance.
2. **Geopolitical Implications and Collaboration Opportunities:** China’s technological leadership in SBSP was viewed as both a source of leverage and an opportunity for diplomatic engagement. Some argued that China’s achievement could be a catalyst for collaboration and a “win-win” scenario, while others cautioned that China might limit incentives for cooperation with the U.S.
3. **Domestic Policy and Public Perception:** There was debate on the approach to developing similar technologies, balancing between private-sector-led initiatives and a government-driven model, with concerns about public skepticism regarding large-scale green energy investments—some recommended leveraging the private sector to expedite SBSP development, with estimates for resource allocation ranging from \$2–5 billion to \$200 billion over a decade. Public skepticism about the need for a massive U.S. program, especially without an immediate military threat, was a concern for the administration.

NSpC Participants’ Recommendations

Recommendation 1: The administration considers this as a vital project for climate change. In the near-term 100-megawatt system should be built. China wants to sell SBSP to the world, like their internet. As a diplomatic effort, the U.S. government has to invest but the scale of investment required is unclear. This should be a Department of Energy–Department of Defense–NASA lead (interagency) effort, which also coordinates regulatory issues (spectrum management).

Recommendation 2: This could be an opportunity to work with China to build SBSP as a global community (China may resist it because they see themselves in the lead). Demonstration with China (incentive for China: next-generation SBSP; part of the international community to use SBSP).

Recommendation 3: Public-private partnership (interagency) to establish a U.S. SBSP system.

Recommendation 4: Utilize this opportunity to pursue climate resilience, renewable energy future, with allied partnerships (NATO, India, Japan, United Kingdom) in SBSP.

Recommendation 5: Consider Department of Defense investments in this space-deployed power capability to support deployed forces. There is a risk when the SBSP is laser based because it has national security implications.

GEO in 2030,” *Space News*, June 8, 2022, <https://spacenews.com/china-aims-for-space-based-solar-power-test-in-leo-in-2028-geo-in-2030/>

Scenario 6: Celestial Core—PRC’s First Space Nuclear Reactor

The People’s Republic of China (PRC) makes a groundbreaking announcement of successfully testing a high-powered space nuclear reactor (>1 megawatt), far surpassing any previously known capabilities. Named the “Heavenly Core,” this reactor is designed for extensive space applications, including long-duration crewed missions, deep space exploration, and resource extraction from asteroids. The successful



deployment and operation of Heavenly Core

asserts the PRC’s technological leadership in space nuclear power. In pursuit of strategic autonomy and dominance in space, the PRC has concentrated significant resources and intellectual capital in developing a robust, efficient, and powerful space nuclear reactor. The initiative is part of a broader strategy to establish the PRC as a preeminent spacefaring nation, capable of undertaking ambitious missions and establishing a permanent presence in space. Heavenly Core is engineered to be exceptionally reliable, safe, and versatile, capable of supporting a wide variety of mission profiles. Its significant power output is a game-changer for space operations, enabling more ambitious missions and the establishment of off-world bases and industrial facilities. The reactor’s design includes advanced safety features and radiation shielding to protect space assets and crew. The revelation of Heavenly Core’s successful test reverberates through the global space community. It not only signifies a technological leap but also reshapes strategic considerations and competitive dynamics in space exploration and utilization. The PRC’s capability to field such advanced technology necessitates a reassessment of global space power balances. The President has asked the Vice President to convene the National Space Council to provide options and recommendations for how the U.S. should respond, both immediately and in the long term, including a “get-well plan” with resource implications.

Scenario Selection Rationale

The U.S. has flown only a single nuclear reactor in space, and the most recent reactor flown by the USSR was in 1988. Both the U.S. (NASA and DARPA) believe nuclear reactors offer significant spacefaring/space power advantage. The PRC likewise has announced plans for fission reactors in space and nuclear shuttles that can mine the asteroid belt.⁸ Were the PRC to fly a space nuclear reactor first, especially if it were of significantly high power (>100 kilowatts), this would likely create a perception the U.S. was behind in a space race and spark public concerns. This is a future that the U.S. should prepare for because the PRC is currently developing and testing a megawatt-class space nuclear reactor.⁹

⁸ Stephen Chen, “China’s Nuclear Spaceships Will Be ‘Mining Asteroids and Flying Tourists’ as It Aims to Overtake US in Space Race,” *South China Morning Post*, November 17, 2017, <https://www.scmp.com/news/china/policies-politics/article/2120425/chinas-nuclear-spaceships-will-be-mining-asteroids>

⁹ Andrew Jones, “Chinese Megawatt-Level Space Nuclear Reactor Passes Review,” *Space News*, August 31, 2022, <https://spacenews.com/chinese-megawatt-level-space-nuclear-reactor-passes-review/>; see also <https://web.archive.org/web/20220826151331/https://news.sciencenet.cn/htmlnews/2022/8/485102.shtml>

Discussion Summary

1. **Strategic Disparity and Technological Concerns:** The council acknowledged China's advancements in space nuclear power as surpassing U.S. efforts, highlighting the strategic gap between the U.S.'s focus on smaller-scale expeditions and China's ambitious plans for extensive solar system exploration. This raised concerns over the long-term dominance of China's techno-authoritarian values in space, potentially overshadowing Western liberal ideals.
2. **Military Implications and U.S. Response:** The military implications of China's enhanced capabilities, such as faster asset deployment and deep space exploration, were emphasized. The council explored options to respond, including increased funding for NASA and DARPA programs, establishing a presidential council, and developing a near-term 100-megawatt system to ensure U.S. technological independence.
3. **Intelligence Gathering and Public Perception:** The need for a clear understanding of China's intentions and capabilities through intelligence operations and monitoring key developments was stressed. Addressing U.S. public anxieties about nuclear technology in space and focusing on its peaceful applications were deemed crucial for garnering public support for the U.S. response.

NSpC Participants' Recommendations

Recommendation 1: Provide messaging to the public that the U.S. is developing and investing in nuclear power and propulsion.

Recommendation 2: Funding priority for nuclear thermal propulsion/space nuclear reactor/nuclear reactor multi-megawatt systems.

Recommendation 3: Vision for space seeking bipartisan support with a public-private collaboration that follows the Moon to Mars program. Generating a holistic space vision that includes deep space capabilities to include nuclear power. Establish goals in space and derive capabilities to match them.

Recommendation 4: Work with allies and partners. The U.S. has strategic advantages over China in space soft power and should exploit this advantage. Collaborate with allies and partners with financial incentives.

Recommendation 5: Update SPD-6 to foster a nuclear space focus. Develop capabilities that are not only for exploration but also have military uses and military tactical capabilities.

CONCLUSIONS AND MACRO RECOMMENDATIONS

The National Space Council exercise provided participants with a realistic sense of the challenges and opportunities U.S. policymakers will face in the coming years. The scenarios demonstrated that in the not-too-distant future the space domain will see strategic competition, rapid technological development, and a fight for global influence.

The scenarios underscore that it is time for a strategic reassessment. The discussions and debate among participants highlighted the need to recalibrate U.S. space policy and reprioritize interest and investments in the space domain. The risks of not doing so could be great; rival nations, such as China, are rapidly advancing in their space capabilities, including through the deployment of anti-satellite systems and sophisticated spaceplanes. These high-tech advances could position them to exploit the U.S.'s dependence on space-based systems. Moreover, as the PRC and others demonstrate progress in energy initiatives like space-based solar power and nuclear reactor technologies, we could witness a shift in global power dynamics.

These technological developments warrant thoughtful consideration, because they could have serious effects on U.S. economic and national security—particularly with respect to the complex U.S. relationship with China. Managing this new stream of potential space events will be difficult and require a nuanced approach that balances competing economic and national security interests. Some of the crises explored occurred without much warning, and NSpC members were able to experience just how quickly and undesirably such events could unfold in the media. Successfully navigating these complexities will require the U.S. to quickly and coherently bolster public confidence in U.S. space leadership through effective strategic communication.

In addition to managing public perceptions, it is important to strengthen abilities to detect and counter negative adversary moves in space. This will require updating our space domain awareness, both through updates to existing platforms and by investing in new SDA technologies. *To do so, the U.S. will need to nurture an ecosystem of innovation through public-private partnerships and collaboration with academia. This cooperation could yield advancements in propulsion systems, space-based solar power, and the deployment of high-capacity nuclear reactors.*

Alongside innovation and investment, America will *require a comprehensive review and revision of U.S. national space policy and military doctrines*. As evidenced during the scenarios, space will clearly be a zone of immense strategic competition, a future warfighting domain, and an area from which nations will project power down onto Earth. These challenges necessitate that we prioritize the protection of our vital U.S. space assets. *As such, space infrastructure should be designated as part of U.S. national critical infrastructure*, since disruptions of space operations are a major vulnerability to the U.S. economy. Protecting our space infrastructure could also go a long way toward providing reassurance both to the American public and to our international partners.

Although the scenarios explored focused on how the U.S. should react to future challenges, they all highlighted *the vital role of diplomacy in the establishment of international space norms*. In almost all scenarios, participants highlighted the importance of involving our allies in this effort,

and understood the necessity of a robust legal framework to govern space activities. It was evident that successful space strategy will entail fostering strong diplomatic ties and creating *new international agreements that promote responsible behavior in space, while also building enforcement mechanisms for dealing with nefarious actors.*

Ultimately, the U.S. will need to take on a leadership role in any international engagement and global cooperation on space. Responsible stewardship should fall to the U.S. to ensure that universal principles of freedom and respect are instituted across the space domain. If America takes the lead in this regard, it can promote a vision of space that aligns with its values and those of its allies.

Strategic recommendations that apply universally across all situations presented:

1. **Invest in Critical Technologies for Space Leadership**
 - Prioritize space nuclear power and propulsion, space-based solar power satellites, and spaceplanes.
 - Allocate resources to accelerate development and maintain U.S. preeminence in these key areas.
2. **Achieve U.S. Primacy in Norm-Setting Demonstrations**
 - Adjust goals, schedules, and funding to ensure U.S. accomplishments precede those of competitors, particularly China.
 - Identify and prioritize high-profile space missions that shape public perceptions and international norms.
3. **Maintain Readiness to Deploy Countermeasures and Equivalent Systems**
 - Develop a robust industrial base and rapid manufacturing capacity to deploy operational systems within 12 months if needed.
 - Ensure U.S. research and development keep pace with potential adversaries' prototype testing and demonstrations.
 - Invest in effective countermeasures and defensive systems to neutralize threats and preserve U.S. space capabilities.

LIST OF PARTICIPANTS

NAME	BRIEF BIO
Dr. Greg Autry	Chair of the Safety Working Group on the Commercial Space Transportation Advisory Committee (COMSTAC) at the Federal Aviation Administration. Nominated by the President to serve as the Chief Financial Officer at NASA (due to circumstances of 2020, the U.S. Senate never held a final confirmation vote on the CFO nomination)
Mr. Bill Bruner	CEO of New Frontier Aerospace, a space technology development and consulting company; former NASA Assistant Administrator for Legislative and Intergovernmental Affairs
Dr. Namrata Goswami	Professor at the Thunderbird School of Global Management at Arizona State University and the Joint Special Forces University; a consultant for Space Fund Intelligence; co-author of the book <i>Scramble for the Skies: The Great Power Competition to Control the Resources of Outer Space</i>
Dr. Bhavya Lal	Former NASA Associate Administrator for Technology, Policy, and Strategy; Former NASA Chief Technologist (Acting); Former NASA Chief of Staff (Acting)
Mr. Douglas Loverro	President of Loverro Consulting and former Deputy Assistant Secretary of Defense for Space Policy
Dr. John C Mankins	President of Artemis Innovation Management Solutions LLC; former NASA Manager of Exploration Systems Research and Technology within the Exploration Systems Mission Directorate
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Project Authors

Lt. Col. Peter Garretson, USAF (Ret.) is a Senior Fellow in Defense Studies at AFPC and a co-director of the SPI. He is a prolific writer and is co-author of *The Next Space Race: A Blueprint for American Primacy* (Praeger, 2023) and *Scramble for the Skies: The Great Power Competition to Control the Resources of Outer Space* (Lexington Books, 2020). Previously, Garretson spent over a decade as a transformational strategist for the Department of the Air Force, where he served as a strategy and policy advisor for the Chief of Staff of the Air Force, as Division Chief of Irregular Warfare Strategy Plans and Policy, and as the Chief of the Future Technology Branch of Air Force Strategic Planning. Garretson has extensive wargaming expertise, having helped design, been a player in, and led both red and blue teams in Net Assessment Wargames. Garretson has designed, planned, and executed a diversity of simulations and wargames, including three Title X wargames for HQ U.S. Air Force, the first interagency planetary defense simulation, the U.S.-U.K.-France trilateral strategic initiative airpower wargame, the Air Command and Staff College Joint Warfare wargame, and two Space Horizons Task Force wargames (including one with NASIC). Garretson has designed multiple scenarios supporting U.S. Space Force Space Futures Workshop, Keplerian Chess, the Nonproliferation Policy Education Center (NPEC), and the AFPC National Space Council Simulation.

Mr. Richard Harrison is the Vice President of Operations and Director of the Defense Technology Program at AFPC, where he co-directs the AFPC Space Policy Initiative (SPI). He has published numerous articles and is co-author of *The Next Space Race: A Blueprint for American Primacy* (Praeger, 2023) and co-editor of *Cyber Insecurity: Navigating the Perils of the Next Information Age* (Rowman & Littlefield, 2016). Prior to his work at AFPC, Harrison spent several years as a systems engineer in the aerospace sector for Lockheed Martin. He completed his master's degree in Security Studies from Georgetown University's School of Foreign Service and also earned a bachelor's degree in Aerospace Engineering from Penn State University.

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ABOUT THE SPACE POLICY INITIATIVE

For America, space represents the next great strategic frontier.

Yet the United States now faces growing competition, and a growing threat, in that domain from countries like Russia and China, each of which is developing technologies capable of targeting U.S. space assets. At the same time, the global space economy is primed for lift off, as technological advances and scientific breakthroughs increasingly put investments and resources there within reach. According to some estimates, within the next two decades, ventures like space tourism, the harnessing of solar energy, and space mining will propel the overall value of the space economy to \$1 trillion.

As such, defining a strategy for ensuring space security, sustainability, and commerce needs to be a strategic priority for the United States. Our top-notch array of experts—including Peter Garretson, one of America’s leading pioneers of space power—forms a robust team that will make a major contribution to crafting space policy through briefings, conferences, and publications designed to provide policymakers with the ideas and tools they need to chart a course in this emerging domain.

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In order to act, America’s leaders need to grasp the implications of the unfolding space race. AFPC’s Space Policy Initiative (SPI) is designed to broaden the knowledge base among key officials and stakeholders through a wide range of educational activities, from convening major space conferences to publishing cutting-edge analysis to hosting tabletop wargames and simulations. Our efforts focus on four main themes: (1) developing a robust space economy, (2) harnessing space energy, (3) ensuring that the U.S. military maintains a secure space environment, and (4) understanding the societal impacts of space.

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APPENDIX

The Appendix provides a comprehensive overview of the scenarios explored during the workshop, offering valuable insights and supplementary data. Each scenario is accompanied by detailed information that was furnished to the participants, specifying the assigned Democratic or Republican administration in power. The Appendix also includes the assessments, concerns, and recommendations put forth by each National Space Council (NSpC) participant. To further enhance understanding, a discussion summary (aided by AI) is included, which succinctly highlights the key tensions and points of deliberation that emerged during the scenario discussions. This additional context aims to provide a more nuanced and complete picture of the complex issues addressed throughout the workshop.

Scenario 1: Incident in the Cosmos—The Downing of a U.S. Satellite

Scenario Supplemental Data Provided

Director of National Intelligence & Secretary of Defense

Could confirm that a PRC satellite was very close to our satellite, but neither that the PRC satellite attacked our satellite nor that an attack was intended (no signals intelligence has been found explicitly authorizing action).

Director of National Intelligence

Had a covert cyber option that could be deployed against PRC inspection satellites with uncertain success.

Secretary of Defense

Had a covert inspection satellite they could deploy in a tit-for-tat manner against one or more PRC satellites, including inspection satellites.

Issues and Considerations

For this exercise, the National Space Council (NSpC) was assembled under a Republican administration. Below are the summaries of each NSpC participant's contributions to the debate on how best to respond to the respective scenario, along with points of conflict:

Vice President

Concerns: The administration needs to be seen as strong, as weakness could allow for further Chinese deceptive attacks. The Vice President was also concerned about how restrictive norms will be now that the action has already occurred.

Secretary of Defense

Assessment: Potentially adversarial inspector satellite maintains operational ability, the U.S. satellite indicated no internal malfunction, and could be a natural cause of disaster (e.g., a micrometeoroid)—though highly likely a deliberate attack. Space situational awareness is not degraded as multiple assets (some not publicly acknowledged) are available.

Options: The U.S. Space Force is ready to execute several options to show resolve, including jamming telemetry, tracking, and command (TT&C) to all Chinese inspector satellites. It is not possible to use the X-37 spaceplane to capture the inspector satellite; it could only impact it.

Concerns: The U.S. is more dependent on space than China, so if the U.S. loses space capabilities there will be a deficit in capability. Eliminating all Chinese inspector satellites without a strong basis for intelligence would be a massive escalatory step. No other Chinese satellites are near U.S. assets but could be there in about three days.

Recommendations: The U.S. Space Force should begin maneuvering another Geosynchronous Space Situational Awareness Program (GSSAP) satellite in place.

Director of National Intelligence

Assessment: The Chinese have been inspecting U.S. assets. The destroyed asset was a space domain satellite that is key to our knowledge of intelligence and early warning over the Eastern Hemisphere. For the past decade, China has been publicly warning against militarizing space, while they add offensive assets. We suspect China conducted the attack, but no signals intelligence has been found explicitly authorizing action. Multiple assets are conducting space domain awareness; the incident has not affected coverage.

Concerns: The satellite was part of international means for international space awareness (neighborhood watch) to inform other countries or companies of what is going on in the geostationary (GEO) domain. If intentional, China is attacking a method that the U.S. and allies have agreed to use to understand what happens in all areas of space.

Secretary of Commerce

Concerns: Trade relations with China are near \$1 trillion and the industrial supply chain is dependent on China, so it's important to consider these factors prior to any escalatory action.

Question: Is it possible to use a spaceplane to capture the Chinese inspector satellite?

Recommendation: Avoid using untrue nomenclature for authoritarian regime names, as in People's Republic of China (PRC) for China or North Korea as a "Democratic People's Republic." We should refuse to use those terms as they are not accurately descriptive.

Secretary of State

Assessment: The U.S. requires an international legal basis to support a response. The use of force authorized under Chapter 7 of the U.N. Charter is only for self-defense for an attack that already occurred or a forthcoming attack. There may be a path to respond through the Outer Space Treaty.

Concerns: Without certainty, the government will have limited options driving decision-making going forward.

Recommendation: A government response should not be limited to defensive tactics and only in the space domain. The full panoply of tools across all domains and through mechanisms of international relations should be utilized if the destruction is attributable to China. Shift coverage to allies and partners to share the space domain awareness burden. Have NASA ensure debris will not harm other space assets, which could foster conversations with the Chinese, who also have assets and personnel. Send briefers to the Hill to provide status updates to congressional leadership.

NASA Administrator

Assessment: The physics needs to be reviewed to eliminate the possibility of a coincidence of destruction happening while an investigator satellite was nearby. More time is necessary to review the situation before unnecessary escalation. It is important to be cautious of a potential Chinese strategy aiming to provoke war in space and falling into a strategic trap.

Concerns: Are any additional inspector satellites moving close to U.S. assets? How can we respond? During peacetime it is okay to move GSSAP satellites around; in this situation, it needs to be a national policy decision (requires approval at the National Security Council in this crisis situation).

Secretary of Energy

Concerns: Are there additional inspector satellites close to U.S. assets?

Assistant to the President for Domestic Policy

Assessment: Given the level of public attention, we need to show the President has the situation in hand and be transparent to both the public and allies.

Recommendation: Have the Secretary of Defense and the Director of National Intelligence hold regular press conferences that share information as it becomes available. Immediately clearly communicate that we still have space domain capabilities.

Director of the Office of Science and Technology Policy

Assessment: We cannot have just a single military response. We need five-prong responses with a diplomatic response to an adversarial nation but also need to make a broader call to international norms in space activities.

Recommendation: Never let a crisis go to waste—form an international coalition to share intelligence and forcefully call for adherence to international norms even as we explore attribution. Launch a comprehensive communication campaign for the U.S. public and international partners and global community to make them aware of the U.S. commitment to U.S. and global space assets. Once attribution is established, the coalition can condemn actions and potentially impose sanctions or other measures in response.

CCP Subject Matter Expert (Unavailable)

White House Press Secretary / External Press Agitator

Assessment: It is important not to put the President out in front of the public until the last minute. A spokesperson, the Vice President, and the National Security Advisor need to know confirmable facts to attempt to catch up with what's going on in social media.

Concerns: How sure are we that this was Chinese aggression rather than a cyberattack that messed with the satellite's internal rotation, causing it to rip itself apart?

Presidential Policy Advisor

Assessment: Response options need to be strong and more than a reprimand to assuage the public's outrage (who views the attack as aggression).

Concerns: A few retired generals believe this attack is analogous to actions during the Cold War.

Recommendation: During public briefings, do not discuss the need to deescalate and do not mention jamming any communications to Chinese inspector satellites; instead, state that defensive actions are being taken.

Discussion

Faced with the prospect of a Chinese inspector satellite suspected of destroying a critical American space domain asset, the council members grappled with how to respond effectively, with key points of conflict emerging.

One major tension was between projecting strength and preventing escalation. The Vice President and some advisors believed a strong response was necessary to deter China from

further aggression. However, the Department of Defense and others *cautioned against escalation without definitive proof*. While it would be possible to eliminate Chinese inspector satellites, with no concrete intelligence it would be a massive escalation. They highlighted America's greater dependence on space capabilities compared to China, the U.S. reliance on China for a robust industrial supply chain, and the potential for a devastating space arms race.

Another point of contention was the choice between a military or diplomatic response. If necessary, the Department of Defense could put forward a range of options from maneuvering our assets, in low Earth orbit, conducting retaliatory anti-satellite attacks, to using a jamming and non-kinetic response. The Department of Defense pushed for options involving the U.S. Space Force, while the Department of State and the Office of Science and Technology Policy advocated for a more diplomatic approach. They proposed building an international coalition to pressure China and emphasized the importance of upholding space norms—the thought was to use lack of adherence to norms to penalize China with sanctions.

Transparency versus strategy also presented a challenge. Some advisors stressed the need for public transparency, but the White House Press Secretary prioritized keeping the President out of the spotlight until facts are clear. The consensus was for a swift political reaction and for sending officials to brief Congress in the interim. Additionally, participants thought public briefings should not discuss the need to deescalate and should not mention jamming any communications to Chinese inspector satellites, stating instead that defensive actions are being taken.

There was a level of paralysis from the NSpC in responding without having full intelligence and contingency plans already in place. From the discussion, it was clear that navigating this crisis effectively required careful consideration of several key factors. Attributing the attack definitively is crucial for any response. Building an international coalition to condemn China's actions and uphold space norms is vital. Asset redundancy is an essential component to consider in America's ability to compensate for any damages and maintain its strategic edge. Additionally, fostering communication with China and avoiding an arms race are important for long-term stability and to avoid inadvertent escalation. Finally, the council concluded that the administration needs to project control and maintain public confidence in American space capabilities.

Scenario 2: The Red Celestial Guard—PRC's Co-orbital ASAT Constellation

Scenario Supplemental Data Provided

Director of National Intelligence

Knew this was coming; only surprised by the speed of deployment.

Secretary of Defense

A counter could be deployed in a few years, but to be responsive, it would have to be a large sole-source to a prime contractor, and it would be at significant cost.

Secretary of State

The Europeans and Japanese saw this as threatening and wanted a strong response.

Issues and Considerations

For this exercise, the National Space Council (NSpC) was assembled under a Republican administration. Below are the summaries of each NSpC participant's contributions to the debate on how best to respond to the respective scenario, along with points of conflict:

Vice President

Assessment: There is a need to reassure U.S. allies and discern the intent of the new constellation.

Concerns: Whether the situation is an immediate threat or not, the strength of the response has implications for the White House.

Secretary of Defense

Assessment: The event is not a surprise nor different than expected, as the U.S. has also been building space assets, such as co-orbital and imagery and radar satellites, deploying covert anti-satellite (ASAT) capabilities, and is fast in terms of replenishing capabilities. These actions are directly counter to what has been said about weapons in space over the past 10 years. Covert options are available in reverse.

Concerns: The U.S. must show strengths, not weaknesses. The Department of Defense is against any sort of U.S. capability reveal.

Recommendation: The event should be utilized to the American advantage, holding China accountable, resuming ASAT testing (directed-energy test), displaying points of strength, positioning weapons, and eliminating overt capabilities.

Director of National Intelligence

Assessment: China has been developing systems for a while; therefore, this event is not new nor a surprise.

Concerns: Avoiding actions that may take away from U.S. capabilities that would push the world toward China. Difficulty to prove China's actions without grabbing one of the satellites.

Recommendation: Coordinate an alliance response with both NATO and Asian allies to make a reassuring and nonescalating response that indicates the Chinese action was escalatory.

Secretary of Commerce

Assessment: Interested in economic tools at hand as space contributes \$3 trillion to the U.S. economy. Does not believe that China would not take actions as a result of concerns over assets or personnel.

Concerns: The severity of the U.S. response could escalate to a kinetic retaliation by China.

Recommendation: Refrain from kinetic efforts (no ASAT testing). Apply economic pressure by potentially turning on uncensored internet access for Chinese citizens. Penalize China with an economic response and coordinate with the U.S. Trade Representative.

Secretary of State

Assessment: The deployment is not a violation of the international legal regime.

Concerns: Finding a way to counter Chinese capability as the U.S. does not have the capability to match, disable, or counter this space capability.

Recommendation: Establish an international legal regime that may ban weaponry if the U.S. isn't in a position to address it. Negotiate further clarity on international legal norms of space to establish hostile intention that would justify acts of self-defense and enhance decision-making time.

NASA Administrator

Assessment: Major danger to human safety, complicating national security operations if there is a kinetic situation as it will be difficult to protect civilian space assets. This is an opportunity rather than a threat as the Chinese constellation was expected. The U.S. has covert means to defend national security assets.

Recommendation: Issue a press release in coordination with the White House, shelter in place on the U.S. space station, and embarrass the Chinese regime. Plan to properly protect assets and personnel safety. Reassure allies that we have the situation handled; show a new hand of capabilities, including embarrassing the Chinese regime; and use this as an opportunity to deter and deny this ability in war.

Secretary of Energy

Assessment: Multiple states are approaching operational capabilities, as displayed by the PRC's deployment.

Recommendation: Push through Congress a major investment titled "Orbital Debris Removal and Mitigation," which would include detection and removal, and fund the Department of Defense, NASA, and other agency covert and overt investments. Establish regime strategic arms limitations talks.

Assistant to the President for Domestic Policy
(Unavailable)

Director of the Office of Science and Technology Policy

Assessment: Yes, the new Chinese constellation poses a direct threat but not an immediate threat since there are also astronauts on the Chinese space station. It does not indicate an immediate attack on U.S. assets that would be destructive with lots of space debris. There are numerous U.S. assets in low Earth orbit, so there will be no loss of capability if one satellite is attacked.

Concerns: Doubts of Chinese space stations.

Recommendation: Discussion with Congress over greater investment in advanced space technologies and AI to counter China's space capabilities and better preparation among the U.S. to invest in space-based preparations.

CCP Subject Matter Expert

Assessment: This constellation could be put in place to pre-position assets to try and take over Taiwan.

White House Press Secretary / External Press Agitator

Assessment: Having an unset policy preserves the White House's ability to act with some fluidity. The incident causes public outcry and immediate concern.

Concerns: China does not care about the rules-based system. Private media companies publish material without any proper response from the government or the White House. The U.S. is being seen as toothless and weak.

Recommendation: A reassuring response is needed that refrains from publicly calling out that China has established the norm.

Presidential Policy Advisor

Assessment: The U.S. should not assume that Chinese astronauts in space would deter China from taking action against U.S. assets even if doing so inadvertently harms their own astronauts. The public will likely see the new constellation as an immediate threat. It's important to indicate that the U.S. has a deterrent without specifying a partnership with SpaceX.

Concerns: Being seen as weak. Isolating China is difficult and may limit U.N. support.

Recommendation: A strong response that is multilayered with defense and counter with economic and cyber options, clearly communicating deterrence capabilities. Pull out of moratorium on ASAT testing. Defense capabilities can be shown through a capability test that grabs attention without revealing too much.

Discussion

The deployment of the PRC's co-orbital ASAT constellation raised concerns about the weaponization of space and potential threats to U.S. and allied space assets. The council recognized the need to craft a response that effectively deters China, reassures allies, and safeguards U.S. space assets, all while considering long-term strategic implications and potential technological advancements.

There was a significant focus on understanding China's intent and capabilities. Council members considered the implications for Taiwan and broader regional security in the context of Chinese military capabilities, particularly in the timeframe leading up to 2027. While the co-orbital ASATs present a clear threat, the time required for these satellites to form a kill chain and their overall number may not suffice to substantially degrade U.S. capabilities. The U.S. commercial imagery market and diversified satellite constellations add resilience to U.S. space assets.

The Chinese view the U.S. as the destabilizer through its historical development of ASAT capabilities and attempts to deny space capabilities to China. Members noted that China's actions are not abrupt but part of a long-term strategic plan. The U.S. intelligence apparatus has been keenly aware of these developments for some time; however, U.S. politicians were caught off guard.

The council discussed at length the importance of establishing and adhering to international norms and legal frameworks. Members suggested considering historical precedents such as the nuclear arms race during the Cold War. The potential for initiating arms limitation talks similar to those between the U.S. and the USSR was discussed as a long-term strategy. The Secretary of State suggested that while crafting a response, it is crucial to navigate these norms without undermining the U.S.'s right and capability to defend its assets and ensuring that any international agreements do not disproportionately benefit adversarial powers like China. The strategic and tactical value of norms, particularly in scenarios like the South China Sea, was highlighted, stressing the need to consider how norms could be used as both a shield and a sword.

As a response, the Department of Defense and the Vice President advocated for resuming ASAT testing and showcasing U.S. capabilities to deter China. This could involve a measured demonstration without revealing everything. One option was to emphasize U.S. capabilities and resilience in space, reassuring both domestic and international audiences that the U.S. is not vulnerable and has the means to deter and respond to threats and preserve secrecy around U.S. covert space capabilities to maintain strategic advantage in potential future conflicts. The possibility of limited support from developing nations for certain actions against China was acknowledged, as was a more extreme option of using cyber operations to potentially neutralize China's overt ASAT capabilities.

Meanwhile, the Secretary of State and Secretary of Commerce stressed the importance of a coordinated international response, potentially including economic pressure and establishing new legal norms for space activities. They also suggested exploring non-kinetic responses such as opening up uncensored internet access to Chinese citizens via platforms like Starlink to challenge Chinese censorship and exert soft power.

Scenario 3: Orbital Tensions—Satellite Sabotage Showdown

Scenario Supplemental Data Provided

Director of National Intelligence

Could confirm that this was a deliberate state-backed attack. The director of national intelligence also knew that the U.S. was not innocent, and the intelligence community had conducted low-level cyber intrusions and tampering, with SpaceX assistance.

White House Press Secretary & Secretary of Commerce

Were aware that this was causing a significant drop in the market.

Secretary of State & Secretary of Commerce

Had ongoing infrastructure deals in the developing world dependent on the perception of the security of Starlink.

Issues and Considerations

For this exercise, the National Space Council (NSpC) was assembled under a Republican administration. Below are the summaries of each NSpC participant's contributions to the debate on how best to respond to the respective scenario, along with points of conflict:

Vice President

Assessment: One of the U.S. major space companies has been targeted.

Concerns: There is significant criticism of the U.S. response and security of U.S. assets. An escalatory response could make the situation spiral out of control. Should we prevent Elon Musk, CEO of SpaceX, which owns and operates Starlink, from responding directly and causing escalation? Will this result in more attacks against Starlink? Does the deliberate attack on Starlink indicate that the platform and the services that rely on its architecture are unreliable? Should U.S. space infrastructure be declared part of the U.S. critical

infrastructure via an executive order? Should there be a U.N. meeting to discuss the situation?

Secretary of Defense

Assessment: The incident is more of an economic activity, rather than defense. It is a cyberattack, specifically a zero-day attack often used by companies in smaller nations. The incident does not affect defense capabilities or our ability to use Starlink. The response can be coordinated with U.S. Cyber Command.

Concerns: Threats from Elon Musk regarding launching any additional satellites until the U.S. demonstrates it will protect companies that are investing in space infrastructure. The U.S. does not currently maintain space capabilities to eliminate electromagnetic jamming attacks.

Recommendation: Ready to deploy tools to defeat attacks. Important to show the Chinese that we will respond in kind. Shut down SkynetComm within China, not other nations, for 24–48 hours. Coordinate with allies that utilize SkynetComm to cut ties. Strongly reassure the public and investment community that Starlink services can be relied on. It is important to demonstrate that the U.S. is ready to protect space companies and economic companies from malicious actors. The U.S. should work with companies on future space capabilities. Restore Starlink service in a timely fashion. Cyber response to SkynetComm when Starlink is ready to do so, with a presidential order to directly attack a foreign company. Conduct a demonstration attack against several non-orbital assets that are providing interference, which is justified under international law.

Director of National Intelligence

Assessment: SkynetComm is not a private company and is controlled by the Chinese government. High confidence that the incident was Skynet inference and cyberattacks; however, it is not immediately clear the attack was state sponsored.

Concerns: We need to be careful about designating space assets as critical infrastructure and only making promises we can keep.

Recommendation: Work with SpaceX to understand various attack vectors. Step in immediately to help SpaceX get back online ASAP and foster resilience of using other systems if necessary, but the U.S. should not message China with declaratory statements that cannot be supported.

Secretary of Commerce

Assessment: This is a direct threat to the U.S. economy and global business leadership in space, in addition to a geopolitical signal. It is important to keep our international business and the significance of maintaining the lead in the global internet infrastructure—as it ensures the U.S. can express its opinions on the Internet. Starlink attacks show the global significance of U.S. companies rather than a weakness.

Concerns: Will Elon Musk attempt to respond directly to these attacks? Satellites are susceptible to electromagnetic jamming on infrastructure. Stocks for Space X along with other satellite service companies could massively tank in the markets with these developments—this could have an outsized impact on the economy.

Recommendation: React economically by turning on (or threatening to turn on) uncensored internet for the Chinese population, and opening up Starlink to Chinese citizens for non-

military actions. Consider blocking SkynetComm investments and any Chinese sovereign wealth fund in the United States. Utilize the U.N. for long-term engagement rather than immediate crisis response. It is important to react geopolitically.

Secretary of State

Assessment: State is tracking major initiatives to promote Starlink in Africa and Asia to counter Chinese initiatives. The Logan Act prevents citizens like Elon Musk from responding unilaterally without government approval, but it is not enforced. The U.S. has a broad set of tools at its disposal to respond. The U.N. has no teeth unless the Security Council weighs in. Because China sits on the Security Council, there is unlikely to be a U.N.-level Security Council meeting to shame China.

Concerns: A failure to stand by Starlink could open up opportunities for Chinese competitors. At what point does an incident like this draw a direct kinetic response from the United States? How is this incident any different from the Houthis launching missiles at U.S. shipping? The U.S. Space Force has not put forward a strong response the way the U.S. military has supported shipping.

Recommendation: This situation is an opportunity to deploy sanctions. Engage with the Department of Homeland Security and the Cybersecurity and Infrastructure Security Agency to work with similar companies and Starlink to offer protective measures. Inform allies that use Starlink, our partners, and friendly nations of the risks of using Chinese counterparts, while encouraging them to be on the U.S. side. As a tactical response option, use the Justice Department for indictments against bad actors to provide important signaling.

NASA Administrator

Assessment: NASA and the Department of Defense have the best relationships with Elon. It's important not to risk kinetic war.

Concerns: A tepid response would be seen as unsatisfactory to U.S. citizens and economically.

Recommendation: The NASA administrator and the Department of Defense should reach out to Elon to work together and shut down whatever adversary is doing to harm U.S. space infrastructure.

Secretary of Energy

Concerns: We must answer whether the Chinese government is taking responsibility for the Chinese company's actions or a reverse reaction before formulating any action.

Assistant to the President for Domestic Policy

Concerns: Ramifications of how China perceives going after their regime?

Recommendation: Clearly indicate the U.S. has several layers of capabilities and resilience. Incentivize investments and ensure the U.S. is seen as a reliable partner. Strong and decisive response with clear diplomatic messaging on U.S. intent to the public and investment community. Message of resilience is important to send a signal of an attack. The administration should have a joint message with the Department of Defense.

Director of the Office of Science and Technology Policy

Assessment: There is an emerging narrative of U.S. dependency on SpaceX and other companies for national security, which may be reinvigorated by this incident.

Concerns: *The situation is similar to that of 5G and reliance on Huawei. Should the U.S. place more space infrastructure back in the government's hands?*

Recommendation: Develop strong policy on how U.S. companies engage in space, specifically when there are national security implications. Deploy economic sanctions on Skynet, so the company cannot exist to the extent of restricting supply chain. The Secretary of Commerce could put out a counternarrative of the role of the economy in national enterprise to prevent backing away from national institutions in space.

CCP Subject Matter Expert

Assessment: *Doubts the individual company was working on its own, as there would be consequences* if it didn't involve the Chinese government. China has rarely acknowledged a cyberattack; rather, it works to deny the attack and question the reliability of Starlink.

Concerns: If the U.S. responds "tit for tat," would that warrant some sort of counter-counterresponse from the PRC, which would result in further escalation to a general conflict? *If the U.S. broadcast internet in China, could it be viewed as a threat to the CCP, which could lead to reactions across multiple domains* to the extent of shutting down relations?

White House Press Secretary / External Press Agitator

Assessment: Response systems have gone dark. Trading has halted on NASDAQ and has far-reaching effects on the U.S. and allies across the world. The U.S. is negotiating between Starlink and Nigeria.

Concerns: There is an impact on U.S. emergency services that rely on Starlink's infrastructure.

Recommendation: A daily press briefing to address the drops in services to U.S. citizens and why NASDAQ has closed.

Presidential Policy Advisor

Assessment: There may be some people arguing that interference with economic activities has been occurring for years.

Concerns: House leadership is complaining about the perceived weakness toward the Chinese and in economic standpoints.

Recommendation: *Keep donors happy with an announcement and activity that clearly demonstrates that Starlink and commercial-sector partners are valuable and vital to infrastructure and that their defense and partnership is a priority.* Gear messaging toward leveraging that the commercial section is a value added internationally and the U.S. will protect it to mitigate any perceived weaknesses. Declare space assets with U.S. commercial partners as critical infrastructure, while adding Kuiper (Amazon-backed global broadband satellite provider) as an additional option to safeguard capabilities.

Discussion

Participants considered the situation a grave economic disruption, warranting a balanced response that spans cyber defense measures, public reassurance, and collaborative efforts to diplomatically isolate the threat. The importance of a strategic, cautious approach was noted, emphasizing restoration of affected services and warning against rash policy statements.

The council acknowledged that while the attack did not directly impact U.S. defense capabilities, it posed a severe risk to economic security and commercial satellite operations. This perspective reinforces the need for an economic rather than a military response. While Space X operators have demonstrated an aptitude in response to state-based threats during the Ukraine war, Elon Musk's readiness to launch his own countermeasures has raised concerns about the need for regulatory oversight to ensure private companies do not escalate conflicts on their own. This situation has drawn parallels with other international crises, suggesting a need for clearer guidelines on private-sector engagement in national security issues.

The economic dimensions of the incident loomed large, with the Secretary of Commerce emphasizing the imperative to react decisively to safeguard U.S. economic interests and global leadership in the space domain and prevent markets from crashing. Participants worried about the perceived reliability of Starlink, as its failure could lead allies and global users to question the U.S. capability in maintaining secure and reliable commercial satellite services.

There was a noticeable split between the Department of Defense and the intelligence community on whether the disruption was greenlit by the CCP. The prevailing assessment was that Chinese commercial space entities are inextricably linked to the state apparatus, raising doubts about the company's independence and autonomy in this matter. Proposals such as implementing unfettered internet access for Chinese citizens or blocking Chinese sovereign wealth fund investments in the U.S. were put forth as potential economic deterrents, albeit with risk of escalation. The council considered coordinating with international allies to impose sanctions on the Chinese company responsible, aiming to isolate it economically and diplomatically. While some members advocated for a forceful response to project strength and deter further aggression, others cautioned against overly provocative measures that could be perceived as existential threats by China, potentially prompting severe retaliation across multiple domains.

The incident was viewed by some as an opportunity to reassess the extent of government involvement in space infrastructure, drawing parallels to the debates surrounding Huawei and 5G technology, or to diversify its platforms to reduce dependency on commercial entities like SpaceX. One of the largest questions plaguing the group was whether the U.S. government or a U.S. commercial entity conducted any corporate or economic sabotage to precipitate a reaction from Skynet.

When considering public messaging, the significance of clear communication to the populace was underscored, highlighting the widespread impact on the economy and critical services. Lastly, there was an acknowledgment of the political dimension and the need for decisive messaging that supports the importance of space infrastructure, suggesting its designation as part of the nation's critical assets.

Scenario 4: Celestial Vanguard—PLA's Spaceplane Squadron Emergence

Scenario Supplemental Data Provided

NSpC Participants

Asked for clarification, and the landing country was Venezuela.

Director of National Intelligence

Was aware of academic articles and studies within labs/academies exploring designs for kinetic strike weapons, anti-satellite robotic arms, and nuclear payloads. None was presently being built or tested.

Secretary of Defense

Was aware of concerns raised by NORTHCOM, STRATCOM, and INDOPACOM about effect on war plans; was aware of a contractor proposing a space-based interceptor capability that could counter this capability.

White House Press Secretary & Secretary of State

Were aware of international deals to develop Chinese spaceplane ports in Cuba and Venezuela.

Secretary of State

Was aware that the United Kingdom and France felt this required a strong response.

Secretary of Commerce

Was aware of the significant long-term potential of commercial point-to-point and was aware of U.S. startups that were bullish about their attempt to compete in this market.

Issues and Considerations

For this exercise, the National Space Council (NSpC) was assembled under a Democratic Republican administration. Below are the summaries of each NSpC participant's contributions to the debate on how best to respond to the respective scenario, along with points of conflict:

Vice President

Assessment: The PRC wants to create vulnerabilities in American capabilities with spaceplanes. It may be difficult to determine what the capability means, what it has on board, and the message it sends. Is an escalatory action in response to the earlier Republican administration.

Concerns: Spaceplanes may signal a shift in global strategic power and an intent to escalate. No American counter to this capability. Allies will worry about Chinese spaceplane capabilities. Landing in Venezuela can be viewed as escalatory.

Recommendation: Respond and reassure the American public and allies about American space power.

Secretary of Defense

Assessment: The spaceplane squadron may be used as a Fractional Orbital Bombardment System (FOBS), direct strike weapon, or nuclear delivery system, posing a huge threat to terrestrial targets. Caused by previous administration responses that threatened PRC legitimate repair capabilities and SkynetComm. There is no way to defend against this capability except preemptively. The United States's greatest priority should be defending the American people, even at high dollar costs.

Concerns: The United States has failed to consider the power of such a deep strike in other domains, which is destabilizing. Since this is intended as a warfighting capability, it may ruin the redlines that the U.S. has pushed for in space.

Recommendation: The United States should take short-term actions to reassure the American public, including seeking to match this capability within a few years, continuing to act with due regard, and raising this warfighting capability issue to the U.N. In the long term, we should interdict any munitions launched, increase space situational awareness/space domain awareness capabilities by building out the NorthStar constellation, which offers blanket coverage of near-Earth orbits, and prepare ground-based intercept capabilities, as well as be ready to attack on orbit. This may cost around \$150 billion in the next five to seven years but is necessary to defend the U.S.

Director of National Intelligence

Assessment: This strike weapon has increased CCP morale, and may regenerate and deploy kinetic strike capabilities. While the U.S. government has known about this for a long time, the surprise is the publicity of the squadron's demonstration.

Concerns: The PLA made the declaration that it was an operational squadron, not the China National Space Administration (CNSA) stating it was for space exploration. The demo's location outside of normal test ranges indicates that it may carry anything to any place; it has the ability to carry nuclear weapons. On-orbit weapons may strike at any time to any American city with just a few minutes' notice. The compression of warning time for the President to make decisions creates a new threat.

Recommendation: Create a new plan for dealing with the shortened warning time—understand how this impacts warning strategies and nuclear deterrence.

Secretary of Commerce

Assessment: This is likely a response to an overbearing attack on Skynet by the former Republican administration, and to Elon Musk's monopolistic behavior. The system is likely constructed for orbital debris removal.

Concerns: The former administration had a warmongering attitude, rather than seeking to deescalate. Maintaining a positive relationship between the U.S. and China is paramount as 90 percent of renewable energy systems are from China and a downward trend in relations could affect U.S. climate goals.

Recommendation: Avoid reacting as if this were a threat, and embrace rather than fear this. Seek a diplomatic handshake in space, and opt for long-term arms control over shooting stuff in space. Work toward cooperating with Venezuela rather than punishing them for PRC relations.

Secretary of State

Assessment: The spaceplane squadron is for domestic increases in civil space. The United Kingdom and allies are looking for an American response. Venezuela and Cuba creating a spaceport partnership will significantly change the balance of influence in the Western Hemisphere; Brazil owning a spaceplane may balance Venezuela.

Concerns: Further collaboration with China may be risky. Only the statements are escalatory, but the chilly relationship between China and the U.S. does not appear to be thawing.

Recommendation: Communicate clearly to China that employment of a nuke is a redline, and delineate the consequences for doing so. Work on strengthening international relationships and develop a network of partners.

NASA Administrator

Assessment: This poses another opportunity to catch up. The 1993 invention of the reusable rocket was not capitalized on until Elon Musk—the U.S. should seek to fund capable platforms with scientific, national security, and political advantages.

Recommendation: Develop a Manhattan-level policy led by NASA for a civil face, and create military applications at the compartmented level. Develop our own capabilities and strongly recommend to the President that we must have a deterrent (in addition to defensive capabilities) that will be a flexible capability.

Secretary of Energy

Assessment: This situation is not directly relevant to the Department of Energy, despite the media’s efforts. Nuclear weapons dwelling on orbit is a direct contradiction to the Outer Space Treaty.

Concerns: May hold any American city hostage.

Recommendation: The Secretary of State should bring this issue to the U.N. and address Venezuela as the PRC’s strategic Achilles heel. We should gather intel on what capabilities red countries hold, and put pressure through informal channels on any secret deals signed between the PRC and Venezuela. Place sanctions on Venezuela, and bring our concerns to the U.N. Organization of American States.

Assistant to the President for Domestic Policy

Assessment: The spaceplanes are not an attack and do not warrant a military response; however, this is a great opportunity to demonstrate to the President that China is becoming more aggressive. The American response will determine the administration’s perception, so we must be mindful of the President’s image.

Concerns: Seeming weak here will set a precedent for the next four years. The potential for an unwarned FOBS attack on critical infrastructure is high.

Recommendation: A strong response would include pressuring China through a meeting of the Permanent Five, and demonstrating a concerted response with France and the United Kingdom, in order to push for responsible behaviors and norms in space. Increasing strategic stability here is key; the Secretary of State should call for a dialogue with China on space strategic stability.

Director of the Office of Science and Technology Policy

Assessment: The science and tech community views this as reminiscent of Sputnik. They are excited but have been ignored in these discussions—a push for China to use the spaceplanes for civilian LEO research.

Recommendation: Diplomacy with China should include talks about transparency concerns and the possibility for arms control. Strengthen alliances with like-minded nations, build strength in numbers, and form a united front against space militarization. Advocate for stronger space norms and discourage military weapons by seeking collaboration with China on a different front, which would remind the public of the peaceful applications of space.

CCP Subject Matter Expert

Assessment: The PRC has been asymmetrically vulnerable to U.S. strategic strikes, which has harmed strategic stability. Having the spaceplanes enables the PRC to demonstrate a deterrence measure before hostilities arise and to establish mutual vulnerability.

Concerns: A spaceplane landing in a Western country is a major diplomatic military issue within Latin America. This actively hurts our national security interests.

White House Press Secretary / External Press Agitator

Assessment: NATO and Five Eyes view this as a dramatic moment and are looking to the U.S. for statements of clarity and support.

Presidential Policy Advisor

Assessment: Florida and Hawaii are concerned about the lack of defense for a terrestrial strike. Public fear has produced media headlines—the lack of missile defense and forethought for Chinese force projection has created a lot of fear among allies. In our own hemisphere, we must rely on our status as the leader of a rules-based order, rather than taking unilateral actions. The U.N. Organization of American States is engaged, and mutual vulnerability is likely a stabilizing factor. This does not increase the threat of nukes; the spaceplanes are just another attack vector.

Concerns: Nuclear zero and arms control should remain the priority. Losing face here will lose the support of allies and partners, potentially risking a presidential resignation. Several startups are lobbying and concerned about investments in orbit.

Recommendation: The United States should take the moral high ground and work on the fear factor first.

Discussion

As the discussion unfolded, a fundamental tension emerged—whether to view the spaceplanes as a provocative display of offensive capabilities or a potential platform for cooperation and peaceful exploration. The Secretary of Defense, echoing the Director of National Intelligence, painted a chilling picture: Spaceplanes could be Fractional Orbital Bombardment Systems (FOBS) capable of delivering devastating surprise nuclear attacks. The potential for the Chinese spaceplanes to carry nuclear weapons was seen as a game-changer, necessitating a complete reassessment of U.S. strategic, operational, and tactical policies. The council stressed the importance of preparing for a shift in nuclear deterrence and defense postures to address the reduced warning times and increased threat vectors.

To address this new class of weapons, there were recommendations for substantial investment in satellite surveillance, ground-based interceptor defense systems, and on-orbit attack capabilities—the financial implication of these developments could be substantial, with estimates reaching \$150 billion over several years. There were also perspectives that viewed the spaceplanes as an opportunity for the U.S. to catalyze its own advancements in spaceplane technology (expand on the X-37 program) and to establish a clear lead in space through a combined approach of civil and military developments, akin to a modern-day Manhattan Project for space. Similar to Sputnik, it could be an opportunity to “catch up” on Chinese spaceplane technology, and NASA could lead a “project-level effort with a civilian face but with military capabilities.”

In contrast, the Secretary of Commerce and Secretary of State dismissed this characterization, suggesting the spaceplanes were designed primarily for debris removal. Meanwhile, the Office of Science and Technology Policy thought China could use the spaceplanes for civilian LEO research. The China expert stated their rationale was that the PRC has been asymmetrically vulnerable to U.S. strategic strikes, which has harmed strategic stability. Having the spaceplanes enables the PRC to demonstrate a deterrence measure before hostilities arise and to establish mutual vulnerability.

The geopolitical dimensions of the spaceplane demonstration landing in Venezuela added further complexity to the council's considerations. Members considered engaging in further diplomatic and economic efforts in the Western Hemisphere to counter China's perceived influence in the region, particularly its collaboration with Venezuela. Leveraging international bodies such as the U.N. Security Council, particularly with the support of other Permanent Five members, like France and the United Kingdom, was discussed as a way to exert diplomatic pressure on China. The mixed responses from the American public to escalating tensions underscored the need for careful messaging and engagement.

The discussions also highlighted the need for clear communication and reassurance, both domestically and internationally. The White House Press Secretary emphasized the mixed response from the American public, while allies like NATO members and the Five Eyes nations, particularly Australia, sought clarity and affirmation of American resolve.

Scenario 5: Solar Sentinel—PRC's Leap in Space-Based Power

Scenario Supplemental Data Provided

Director of National Intelligence

Was aware that many of the researchers supporting the space solar power effort were also active in military satellite communications, jamming, and directed-energy research.

Secretary of State

Japan felt threatened by this advance; most other nations saw this as a green energy technology and welcomed China's leadership.

Issues and Considerations

For this exercise, the National Space Council (NSpC) was assembled under a Democratic administration. Below are the summaries of each NSpC participant's contributions to the debate on how best to respond to the respective scenario, along with points of conflict:

Vice President

Assessment: The U.S. could see this as an opportunity for collaboration. The President cares about the U.S. being a leader in green energy and should understand the dual-use implications of space-based solar power (SBSP).

Concerns: Similar to Sputnik, the United States should be concerned that a near-peer competitor launched first. What will be the budget necessary to catch up?

Recommendation: A similar program to the NASA Commercial Lunar Payload Services (CLPS) with bipartisan support might be valuable. Which agency should be tasked with it or if it should be a public-private partnership is uncertain.

Secretary of Defense

Assessment: This is not a practical power-generation capability if deployed in low Earth orbit because it can view a ground station on Earth for only about 15 minutes due to the orbital speed, but it may be harmful to most near-space objects or antennae on the ground.

Concerns: While it is not an immediate threat, it may be used defensively to hide a more aggressive capability.

Recommendation: The government should spend a sizable amount of money to invest in public-private partnerships for a similar program. Be proud about spending this money to invigorate the economy and stimulate creativity and high-tech employment. There should be multiple centers of creativity, with a focused investment in keeping climate and energy front and center. This may require an executive order. The Department of Defense (DOD) and the Department of Energy (DOE) may also be interested in the applications of space-based solar power. It should rival the costs of the Apollo program; \$200 billion in 10 years.

Director of National Intelligence

Assessment: In the past, a joint effort from DOE and NASA demonstrated this tech on orbit. A lot of ideas brought up in the previous administration were not acted upon. An interagency effort would actually provide tangible results. India, Japan, Europe, and energy companies would be extremely interested in this technology.

Concerns: Power generation in space may enable high-power communications and may potentially lead to space-based lasers for ballistic missile defense, attacking ground targets, or putting energy on any ground target. This is a long-term effort, for up to 15 years or so. If the PRC is doing radio frequency (RF), then there is no issue. If they are working on laser technologies, there is an emerging national security threat (RF can do serious damage with gigawatts of energy; lasers can do serious damage with megawatts).

Recommendation: Act on an interagency, international idea for an American SBSP program.

Secretary of Commerce

Assessment: China is following the lead to push renewable energy, and this is an opportunity to partner with them. They should be putting satellites over America and sending down power to our cities to help fight climate change.

Recommendation: We should let China build 90 percent terrestrial capacity and we buy and install the rectifier antennae. It is important to address climate and the U.S. goal of saving the planet, and this can help the President have an opportunity to provide jobs in this renewable energy sector.

Secretary of State

Assessment: This capability has very little substance, though there is great interest in its scope of capabilities. This may be an effort to allow China—one of the greatest polluters—to shift from coal-based energy to cleaner solar energy; this is a part of the climate resilience effort that benefits both the U.S. and the world.

Recommendation: We should seek to work with China as a global community and avoid risking China pulling ahead of the U.S. as a tech leader. We should address the climate change aspect, rather than who is in charge, since the goal is to save the planet.

NASA Administrator

Assessment: We have been studying this since the 70s, but a major deterrent was launch costs; however, today's deterrent is a compact high-power laser as a laser system. Adversaries may be using renewable energy to cloak the military, breaking the seal and setting a precedent.

Recommendation: This is a Manhattan-level project and efforts should be led by NASA and DOE in coordination with DOD and the intelligence community. Government-led with a fixed-price private-sector support. A \$20 billion budget in 10 years and in the next 5 years.

Secretary of Energy

Assessment: Having the government pick the solution is not the right approach, as industry should take the lead to solve the problem fast and at a reasonable price. Strong interest in this technology. This is a strong near-term opportunity for international partners, such as Japan, which has a small-scale demo. A whole government could have very consequential regulatory hurdles cleared to allow a rapid development and demonstration.

Recommendation: Invest. Make an offer of a joint demo with near-term partners, traditional allies, and friends (NATO, Europe, Canada, Australia, and Japan), testing the water. Regulatory hurdles for RF spectrum management will need to be cleared. Should embrace proposals on how to organize initiative and put government money on the table, while NASA and DOE are at the lead.

Assistant to the President for Domestic Policy

Assessment: Space has a dual use, which has been seen with nuclear. The President needs to be in the lead to support private-sector innovation. The \$200 billion estimate is out of scope with capabilities of the private sector as there are a lot of small startups in the new space economy that could accomplish this in half the time for less than \$200 million.

Recommendation: A concerted approach is required, promoting investment in our private sector to pursue solar energy from space, a parallel cooperation with allies with respect to China, to lead and call for a global approach to existential threats like climate change, working together as a global community for peaceful uses.

Director of the Office of Science and Technology Policy

Assessment: This is an amazing breakthrough that the U.S. should congratulate the Chinese on and utilize as an opportunity to collaborate. A need to focus on policy issues, LEO, orbital safety, and transparency. The next big step should be in-situ resource utilization or something on the Moon.

Recommendation: Potential commercial leadership, not the U.S. government. Congress and DOE should play a major role in research and development to direct private-sector investments, indirect support, tax subsidies, and loan guarantees.

CCP Subject Matter Expert

Assessment: *China is unlikely to want to partner with the U.S. If they see themselves as a technological leader, there is little benefit for them to include the U.S.*

White House Press Secretary / External Press Agitator

Assessment: The U.S. public is not convinced, with mixed responses on green energy being a worthy response, as the threat is not clear and present.

Concerns: The public is concerned about weaponry and reaching Earth’s surface. The progressive wing will wonder why the U.S. should build their own SBSP system when we can buy energy from the Chinese.

Recommendation: We need consistent clear messaging that reaches the middle of the political spectrum and explains why the American middle should buy into this and allow billions of dollars to be spent.

Presidential Policy Advisor

Assessment: This is *a potential win-win with climate initiatives and from an energy standpoint*. There have been years of the GOP arguing for energy interdependence with partnerships and commercials to build a green energy capability and avoid the stigma of nuclear fallout. Startups are communicating a little less red tape with government capital with leverage from previous Artemis projects.

Recommendation: Leverage space advocacy organizations and the green sector to advocate to Congress. DOE is the best course of action, to administer a priority placement program with several donors in the private sector. Depending on regulatory burden, reduced seed capital. Some budgets in DOE and some other research and development leveraged with the congressional side. Working with allies should be prioritized to immediate work with PRC.

Discussion

The Vice President and other council members viewed China’s deployment of the Solar Sentinel, the largest object in low Earth orbit (LEO) dedicated to high-capacity solar power generation, as a dual-use technological milestone with implications for the U.S.’s position in green energy and space-based power. While some saw it as an opportunity for collaboration and advancement in renewable energy, others expressed concern over strategic competitiveness and the military potential of such technology.

There were significant concerns about the practicality and perception of SBSP systems. A SBSP system based in geostationary orbit (GEO) was considered more viable than a LEO-based one due to constant visibility over target areas, which a LEO system lacks due to rapid orbital movement. The potential for weaponization, particularly through high-capacity microwave systems, was a concern that needed addressing to reassure both international partners and the U.S. public, who remain skeptical about the militarization of space-based assets.

Discussion highlighted the Solar Sentinel’s dual capabilities, particularly its potential for high-power communication and, more worryingly, its capability for space-to-space power beaming and directed-energy applications—for example, the development of future space-based laser systems capable of intercepting ballistic missiles in flight. The differentiation between RF and laser energy transfer systems was key, with experts noting that while RF systems require gigawatt levels to cause significant damage, laser systems at the megawatt level could achieve substantial destructive effects.

The council also grappled with the broader geopolitical implications of the Solar Sentinel achievement. The CCP Subject Matter Expert cautioned that China might view its technological leadership as a source of leverage, potentially limiting the incentives for collaboration with the United States. Conversely, the Secretary of State framed the development as an opportunity for diplomatic engagement, positioning SBSP as a tool for fostering climate resilience and enabling China’s transition toward a non-fossil-fuel-based economy. Some framed China’s achievement as a catalyst for collaboration and a “win-win” scenario. Proponents of this view, including the Secretary of Commerce, argued that China was merely following the lead of the United States in grappling with the climate crisis, presenting an opportunity for joint efforts and the involvement of American commercial entities in the burgeoning SBSP industry.

Domestic policy advisors and science and technology experts recommended leveraging the private sector’s agility and creativity to expedite development, proposing indirect government support through subsidies and regulatory ease. The question of budget and resource allocation emerged as a critical point of contention, with estimates ranging from \$2–5 billion to \$200 billion over a decade-long timeframe. While some advocated for a private-sector-led model akin to the nuclear power industry, others envisioned a government-driven effort, like the Apollo program, spearheaded by agencies such as NASA and the Department of Energy, with significant support from the Department of Defense and the intelligence community. The Assistant to the President for Domestic Policy cautioned on public skepticism about the need for a massive U.S. program, especially in the absence of an immediate military threat. The White House Press Secretary echoed this concern, acknowledging the mixed public response to green energy investments.

Scenario 6: Celestial Core—PRC’s First Space Nuclear Reactor

Scenario Supplemental Data Provided

Director of National Intelligence

Was aware that several PRC military space systems and weapons systems currently under design assumed Heavenly Core as its power source.

Secretary of State

France and India perceived U.S. leadership as weak and inadequate and had plans to field their own space reactor systems, and expected the U.S. to respond rapidly in kind; Germany and Japan wanted to see the U.S. strongly oppose nuclear power in space.

Assumption is that the nuclear-powered craft is in high LEO/medium Earth orbit.

Issues and Considerations

For this exercise, the National Space Council (NSpC) was assembled under a Democratic administration. Below are the summaries of each NSpC participant’s contributions to the debate on how best to respond to the respective scenario, along with points of conflict:

Vice President

Assessment: The U.S. has recognized the need to be leaders in space nuclear power through the Memorandum on the National Strategy for Space Nuclear Power and Propulsion (Space Policy Directive-6). However, China has leapfrogged the U.S. and taken the lead.

Concerns: China is now ahead of the United States in critical space technology. U.S. maintaining leadership and a rule-based order. Incident not being taken seriously and not an interagency effort.

Secretary of Defense

Assessment: The ability to expand to Cislunar is a huge difference maker. Several impressive abilities could include taking assets where they need to be at a faster pace than chemical propulsion, maneuvering continuously, and station-keeping at LaGrange points and quickly returning to an Earth orbit—all could be integrated into defense capabilities. Commercial and private sectors have lots of money in investments, exploiting resources, government basic research and development power, and resources in space. There have been nuclear reactors in space with the U.S. and others for decades, while Soviets for LEO where one came down in Canada. DARPA is going to unveil the DRACO nuclear thermal rocket soon.

Concerns: There are defense concerns over the kind of power that China exhibits. The Chinese have the ability to exploit space resources, specifically asteroids—similar to their deep-sea exploration on Earth.

Recommendation: It is important to preserve our ability as we mostly have interplanetary nuclear reactors in space. Invest with U.S. technology as this is an incredible opportunity to reinvigorate the high technology industry away from software to real hardware. Do not send the message that we are following China; work with allies, and regain the lead.

Director of National Intelligence

Assessment: Reassuring the entire defense community that we have been working on nuclear power for quite a while, and this situation is predicted. China has been discussing this nuclear development for a decade.

Concerns: Consider the risks about contamination in space and substantial effects on Earth due to the risk of losing control of the nuclear materials.

Secretary of Commerce

Assessment: The U.S. has used radioisotope thermoelectric generators (RTGs) to power Voyager missions traveling deep in space. The Chinese are working with nuclear thermal to take larger crafts on space missions.

Concerns: The ambiguity of the goals for this nuclear-powered Chinese system is curious.

Recommendation: Ally with friends in Germany and Japan to turn away from nuclear and oppose in every manner.

Secretary of State

Assessment: The PRC is just what is needed to get U.S. nuclear space programs kickstarted. There are huge financial opportunities for space mining. The Outer Space Treaty bans stationing nuclear weapons in space, but there are pros and cons to trying to frame it as a nuclear weapon. The PRC's goal is to extend the rule of the techno-authoritarian CCP indefinitely, create an international ecosystem hospitable to advancing their interests, and

displace the U.S. as the world's sole indispensable nation by the 100-year anniversary of their revolution.

Concerns: Concern over the long-term future, the solar system, whose culture and norms govern in the solar system. If China long-haul exploration and transportation, the governing values of CCP in the solar system versus small liberal ideas are a concern. There are additional concerns about some actions doing a broader policy goal, which runs the risk of hemming ourselves in a similar path.

Recommendation: Partnering with our allies could provide the U.S. with a strategic win. Do not collaborate with the CCP.

NASA Administrator

Concern: *We have a misalignment of visions as we are trying to send small expeditions to the Moon and Mars and focusing on kilowatt-scale reactors; meanwhile, the Chinese are trying to expand the Chinese communist civilization across the solar system (we are building ships to sail across the Mediterranean, while China is building ships to sail across the Atlantic).*

Secretary of Energy

Assessment: We have been building this kind of capability ready to go in the U.S. It is important to be prepared for a photo of a Chinese reactor silhouetted against the Moon.

Concerns: The U.S. is still far behind in its capabilities, as there is only one venture with megawatt-class power initiatives. *The difference in scale between the Chinese and American visions could draw our allies away from us.*

Recommendation: The U.S. should set up test facilities, reactor development, and a full investigation at Department of Energy (DOE) national labs to provide capabilities to catch up. Prepare a response to the criticism of the failure to prepare this technology before the crisis. When messaging to the public, point to the strong activity on space nuclear propulsions, as nuclear thermal DOE with NASA and the Department of Defense (DOD), as the U.S. taking a smarter path to space nuclear energy while we make necessary investments to catch up. Need policy guidance in DOE, programs, and development for multi-megawatt systems.

Assistant to the President for Domestic Policy

Assessment: U.S. private-sector startups are also looking at nuclear propulsion. This is an opportunity for global powers to cooperate and establish responsible rules of the road and new technology and applications.

Concerns: Highlight the concern using highly enriched uranium (HEU) and want to discourage HEU nukes proliferation.

Recommendation: Prioritize cooperation with allies, but consider bringing China into the fold in their investments and developments, if it's responsible.

Director of the Office of Science and Technology Policy

Assessment: NASA invested in both nuclear power and propulsion, making good progress. The more money, the better, as we are aware of Chinese investment. NASA is working with the European Space Agency, but NASA has failed to communicate well with colleagues. We have fallen behind on investments as China is investing at higher levels and our investment is

too low for a prototype in the next five years. NASA is only building surface power systems, not space power. There is nothing against this development in the Outer Space Treaty because it is not a weapon.

Concerns: Many questions associated with space nuclear safety in space, such as what is safe enough, how to dispose, what power sources, what to use, etc.

Recommendation: Funding is critical as investing both surface power and propulsion at NASA and DARPA is impossible without it. Collaborate on safety and policy issues; do not collaborate with China on technology development. NASA has not been able to effectively make the case for space nuclear power; DOD should be more vocal about the need for power in space.

PRC Subject Matter Expert

Assessment: There is not much incentive for China to cooperate with the U.S. It may be possible to collaborate on safety and security. In the past, the Chinese have not cooperated on norms or specific space norms.

White House Press Secretary / External Press Agitator

Assessment: The previous administration should have invested more in space nuclear power.

Presidential Policy Advisor (Unavailable)

Discussion

The council discussed the implications of China’s newly tested high-powered space nuclear reactor, acknowledging that while their own country had laid the groundwork for leadership in space nuclear power, they now faced a situation where they had been overtly surpassed.

One of the primary tensions that emerged during the meeting was the conflict between the U.S.’s vision of space exploration and China’s ambitious plans. While the U.S. has been focusing on smaller-scale expeditions to the Moon and Mars, China appears to be aiming for a more expansive presence in the solar system, with the potential to exploit resources like asteroids and establish a civilization beyond Earth. This dichotomy raised concerns about the long-term implications of China’s techno-authoritarian values governing the solar system, as opposed to the liberal Western ideas championed by the U.S. and its allies. The development of nuclear-powered spacecraft could be enabling key technology for China to pursue a broader space vision. One member stated, “We are building ships to sail across the Mediterranean, while China is building ships to sail across the Atlantic.”

As the council considered geopolitical implications, the disparity between our vision and that of China’s could draw allies away from the U.S.—for example, France perceived the U.S. to be weak. Some members considered allying with Germany and Japan, who have turned away from nuclear power, while India’s planned nuclear reactor launch added another layer of complexity. Additionally, the relevance of the internationally agreed upon Outer Space Treaty, in light of China’s advancement, was another point of discussion. While some council members suggested exploring whether China’s reactor could be framed as a violation of the treaty’s ban on stationing nuclear weapons in space, others argued that the technology did not clearly fall under the treaty’s prohibitions and that framing it as a weapon could rein in the U.S. nuclear space advancements.

The Secretary of Defense highlighted the potential military implications of China's enhanced capabilities, such as faster asset deployment, continuous maneuvering, and efficient station-keeping at Lagrange points. Defense concerns were emphasized, especially China's ability to take assets in Cislunar space and beyond, as well as their deep space exploration capability, which allows for the exploitation of resources like asteroids.

Questions were raised about whether the U.S. had been caught by surprise and why, with calls for hearings to be conducted. NASA's investments in nuclear propulsion were scrutinized, and the agency's failure to communicate with colleagues was highlighted. China's higher investment compared to the U.S. was cited as the reason for their advancement along with the previous administration's role in putting the U.S. in this disadvantageous situation. There was no shortage of blame to go around as the lack of congressional appropriations was identified as an issue as well.

Amid these tensions and contradictions, the council explored various options for responding to China's progress. These ranged from increasing funding for NASA and DARPA programs to establish a presidential council focused on prioritizing nuclear propulsion and power in space. The Democratic administration's efforts in building on Space Policy Directive 6 (SPD-6), which focuses on a 40-kilowatt Artemis base camp, were recognized. The council considered advocating for a significant U.S. project to develop a near-term 100-megawatt system, paralleling China's ambitions but ensuring U.S. technological independence. Budget proposals ranged from \$2 billion to \$5 billion, reflecting a strong commitment to reestablishing U.S. leadership in space nuclear technology.

The need for a clear understanding of China's intentions and capabilities was also emphasized, with suggestions for conducting intelligence operations and monitoring key developments, like China's mission to the asteroid 16 Psyche. Finally, there was agreement that U.S. public anxieties about nuclear technology in space needed to be addressed, including the handling of nuclear material in space and the associated risks. The council agreed that the government needs to provide reassurance and a focus on the peaceful applications of space nuclear power as that is crucial to garner public support for the U.S. response.