



National Space Society

Position Paper:

A Space Guard to Enable, Regulate, and Protect National Civil and Commercial Space Activities

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Abstract

The National Space Society (NSS) is proposing a transparently operating civil U.S. Space Guard with a national and collaborative international scope of operation. Such a civil Space Guard would initially be established and funded with the capacity and responsibility to: (a) license and regulate U.S. civil and commercial space activities, other than as currently conducted by the Department of Commerce (DoC) space offices for various functions, by the Federal Communications Commission (FCC) for radio frequency spectrum, and by the Office of Commercial Transportation in the Federal Aviation Administration (FAA) for rocket launches; (b) monitor and guide U.S. civil and commercial space activities pursuant to applicable international treaties; (c) enforce U.S. civil and commercial space regulations; (d) coordinate with U.S. civil and commercial space and aviation offices to enhance efficiency, safety, and space traffic management; and (e) engage the international space community in collaborative efforts to advance space development throughout Earth orbit, cislunar space, lunar surface operations, orbital spaces, solar system planetary bodies, and beyond.

In the future, the U.S. Space Guard's role would expand by adding the capacity and responsibilities to: (a) carry out inspections and enforcement related to unlawful activities in and around restricted commercial safety and work zones established by U.S. civil and commercial entities; (b) license and regulate U.S. civil and commercial orbital debris removal technologies and missions; (c) maintain U.S. civil and commercial navigation aids, shelters, and other space infrastructure (where no licensed missions are tasked); (d) carry out in-space search and rescue of U.S. persons and property and collaborate internationally on such search and rescue per U.S. agreements, including U.S.-ratified international space treaties; and (e) as the lead U.S. agency, coordinate national space offices and collaborate with international space offices for planetary defense against near-Earth objects and extreme solar events.

NSS suggests that a feasible pathway to creating a national civil Space Guard would be to evolve it from the Commerce Department's uniformed NOAA Officer Corps (NOAA Corps).

Why Does the United States Need a Civilian Space Guard?

The next 15 years will see a dramatic increase in the number of rocket launches competing with commercial airliners for airspace before reaching orbit. In coordination with the FAA, the aviation and space industries have begun to work together to find and implement technical solutions to avoid long periods of airspace closure.¹ However, beyond airspace congestion lies orbital congestion represented by 2000 working satellites and more than 8000 tons of debris.² Beyond Earth orbits, civil and commercial in-space vehicles and all manner of in-space infrastructure will eventually be populating cislunar and other orbital spaces. A likely ten-fold increase in launches and orbiting satellites during the next 15 years calls for better coordination among all the civil air and space offices in the U.S. federal government, complete with greatly enhanced spacesituational awareness and space traffic management. In this connection, NSS has recommended that the proposed Space Guard have lead responsibility for comprehensive space traffic management.³

When rockets launch to orbit from U.S. coastal sites, where they fly over water instead of populated landmasses, the U.S. Coast Guard (USCG) clears boats from entering the hazard zone.⁴ In peacetime, USCG maritime activities are wholly focused on the protection and safety of persons and property, that is, guardianship. Such guardianship will one day also be needed in the space environment. A civil and transparently acting entity will soon be needed with the capacity to:

- **Regulate:** license and regulate U.S. civil and commercial space activities to the extent not currently covered by DoC, FAA, and FCC , including: (i) missions to test, build, operate, service and maintain in-space vehicles and infrastructure; (ii) activities not involving the direct provision of telecommunications, media or information services to users on Earth (e.g. space tourism, in-space manufacturing, cislunar and lunar surface missions, space solar power, asteroid mining); and (iii) standards and licensing for orbital debris mitigation and remediation;
- **Organize:** Based on previous NSS recommendations⁵, organize and enable safe U.S. civil and commercial space activities related to comprehensive space traffic management, while promoting and coordinating with analogous entities internationally;
- **Guide:** monitor and guide U.S. civil and commercial space activities and policy formation pursuant to applicable international treaties;
- **Enforce:** carry out the enforcement of U.S. civil and commercial space regulations through fines, license revocations or other means;
- **Enable:** provide coordination for U.S. civil/commercial space and aviation offices to enable a vibrant commercial space economy;

- **Collaborate**: engage the international space community in collaborative efforts to advance space development throughout Earth orbit, cislunar space, lunar surface operations, orbital spaces, solar system planetary bodies, and beyond.

NSS also envisions a time in the near future where the U.S. Space Guard will need to evolve to handle several new responsibilities analogous to the responsibilities of the Coast Guard in the maritime environment. These responsibilities will require expanded new capacities and funding to match a rapidly growing commercial space economy:

- **Inspect and Enforce**: carry out inspections and enforcement related to restricted U.S. civil and commercial safety and work zones;
- **Mitigate/Remediate**: set standards, license technologies, and regulate U.S. orbital debris mitigation and removal;
- **Protect**: maintain navigation aids, emergency shelters, and other space infrastructure (where no licensed missions are tasked);
- **Search and Rescue**⁶: carry out in-space search and rescue of U.S. persons and property and collaborate internationally on such search and rescue per U.S. space agreements, including U.S.-ratified international space treaties;
- **Defend**: as lead agency, coordinate national space offices and collaborate with international space offices for planetary defense against near-Earth objects and extreme solar events.

A military entity could theoretically carry out some of the proposed guardianship activities, like the rescue of persons and property. However, such guardianship taskings would distract from and possibly hamper its war-readiness. Another difficulty has to do with the international nature of these future proposed duties. Dozens of countries claim to have a space program, and 13 countries have already built rockets and launched them into space. Moreover, most of the debris in orbit is the result of launches by Russia/Soviet Union, the United States, and China, and the removal of most of this debris will take collaboration among the three countries.

A war-fighting arm of the U.S. government would be hamstrung in collaborating with non-allies to remove debris or resolve other international space issues. The necessity to maintain military advantage over perceived or potential enemies brings with it the requirement to closely keep technology advancements, tactical protocols, and overall military strategy secret. To maintain its war-fighting advantage and effectiveness, a military force cannot operate openly and transparently, except in constrained areas with military allies. This secrecy requirement, plus its perceived attack capability, would greatly handicap its ability to help manage international space traffic or remove space threats through collaborative international action.

A transparently operating civilian Space Guard, however, would not be hampered by the above military-related issues.

Rational Pathway to U.S. Space Guard: Evolution from NOAA Corps

The NOAA Commissioned Officer Corps (NOAA Corps) is one of the nation's seven uniformed services. NOAA Corps officers are an integral part of the National Oceanic and Atmospheric Administration (NOAA), an agency of the U.S. Department of Commerce. The NOAA Corps today provides a cadre of professionals trained in engineering, Earth sciences (including geology, oceanography, and meteorology), fisheries science, and other related disciplines. Corps officers operate NOAA's ships, fly aircraft, manage research projects, conduct diving operations, and serve in staff positions throughout NOAA.

The NOAA Corps reports to civilian authority and no congressional authorization would be required to evolve it into the U.S. Space Guard. The Commerce Secretary can simply adapt its mission, but Congress would need to pass legislation to appropriate funding. NSS therefore finds it feasible to create a transparent, civil U.S. Space Guard by evolving it from the NOAA Officer Corps to carry out the proposed guardianship, coordination, and collaboration duties described in this paper.

Conclusion

NSS suggests that a U.S. Space Guard evolved from the NOAA Corps can provide the guardianship duties proposed above and provide coordination for the various currently dispersed executive space and aviation offices, especially as connected to space traffic management. NSS also suggests that the proposed civil entity, housed within the Department of Commerce and coordinating with executive space offices throughout the federal government, can help evolve industry best practices into an enabling governance framework to facilitate U.S. civil and commercial space. As a non-military guardianship and coordinating entity, it's great advantage will be its ability to work transparently and collaborate both nationally and internationally.

¹ Davenport, Chris et al. "Gridlock in the Sky," The Washington Post, 12 December 2018, https://www.washingtonpost.com/graphics/2018/business/spacex-falcon-heavy-launch-faa-air-traffic/?utm_term=.e414b0cdb3b2

² See <https://www.telegraph.co.uk/science/2018/03/29/astro-litter-picker-launches-help-clean-up7600-tonnes-space/>. Note: 7600 tonnes = 8377.566 tons.

³ <https://space.nss.org/media/NSS-Position-Paper-Space-Guard-2017.pdf>

⁴ Davenport, Chris et al. *Op. cit.*

⁵ For a useful definition and full discussion of space traffic management, see "Space Guard: A New Organization to Facilitate Safe Space Activities" at <https://space.nss.org/media/NSS-Position-Paper-Space-Guard-2017.pdf>.

⁶ Search and rescue in the space environment would operate as in the current maritime environment. As such, these capabilities would lessen the need to strive for absolute self-reliance in space. Such in-space self-reliance, under the current aviation model, requires complex and costly multiple layers of redundancy.

About the National Space Society (NSS): NSS is an independent non-profit educational membership organization dedicated to the creation of a spacefaring civilization. NSS is widely acknowledged as the preeminent citizen's voice on space, with over 50 chapters in the United States and around the world. The Society publishes *Ad Astra* magazine, an award-winning periodical chronicling the most important developments in space. To learn more, visit space.nss.org.