

EMBRY-RIDDLE
Aeronautical University™
SCHOLARLY COMMONS

Space Traffic Management Conference

2014 Roadmap to the Stars

Nov 6th, 1:30 PM

U.S. Private On-orbit Space Situational Awareness Systems and Services: Legal and Regulatory Challenges

Michael Mineiro
mmineiro@ida.org

Follow this and additional works at: <https://commons.erau.edu/stm>



Part of the [Administrative Law Commons](#), [Air and Space Law Commons](#), [National Security Law Commons](#), and the [Science and Technology Law Commons](#)

Mineiro, Michael, "U.S. Private On-orbit Space Situational Awareness Systems and Services: Legal and Regulatory Challenges" (2014). *Space Traffic Management Conference*. 11.
<https://commons.erau.edu/stm/2014/thursday/11>

This Event is brought to you for free and open access by the Conferences at Scholarly Commons. It has been accepted for inclusion in Space Traffic Management Conference by an authorized administrator of Scholarly Commons. For more information, please contact commons@erau.edu.

Abstract

Dr. Michael C. Mineiro, mmineiro@ida.org, Science and Technology Policy Institute

Scope: Surfacing Issues

Area(s) of Interest: Space Situational Awareness, Legal and Policy Aspect

Title: U.S. Private On-orbit Space Situational Awareness Systems and Services: Legal and Regulatory Challenges

Abstract: One component of Space Traffic Management (STM) is on-orbit Space Situational Awareness (SSA) systems and services. Advances in technology and a growing demand for SSA services, information, and data, coupled with U.S. Government policy that promotes the purchase and use of commercial SSA capabilities, means that private commercial sector is likely to have an important role to play. To date, there is no federal agency with clear jurisdiction over on-orbit remote sensing operations. This paper examines the current regulatory framework, identifies gaps and limitations, and identifies possible ways forward.

I. Introduction

In the United States, there is an established industry providing space-based remote sensing of the Earth's surface. This industry is diverse with leading Earth imaging companies, like DigitalGlobe, newer Silicon Valley backed imagery startups, like Skybox, and a number of commercial and academic institutions with space-based systems that can actively or passively remotely sense across a range of electromagnetic spectrum. However, currently no U.S. companies are offering commercial on-orbit space-to-space remote sensing. But it is only a matter of time before the U.S. private sector will seek to operate space-systems that are designed and purposed to remotely sense outer space, not the surface of the Earth. This is driven in part by recent technological advances in satellite, remote sensing, and information communication technologies that are creating new opportunities for entrepreneurs to identify value propositions for private sector and government customers. This includes providing on-orbit SSA services, information, and data that can be used to support STM.

To illustrate, AGI is now offering a service called ComSpOC. Accordingly to AGI, ComSpOC is a state-of-the-art space situation awareness (SSA) facility that collects, fuses, and processes space object tracking data from a global network of diverse commercial sensors to generate accurate and timely SSA products.¹ This will include "space based sensors" that provide "imagery and full motion video of space objects," "accurate and rapid maneuvers detection," and

¹ <http://comspoc.com/>

1st Annual Space Traffic Management Conference "Roadmap to the Stars"

“rapid indications of potential threats.”² If ComSpOC moves forward, there will need to be a commercial space-based on-orbit remote sensing system that provides space-based SSA data.

In order for the U.S. private commercial sector to provide such services, a regulatory framework should be in place that authorizes and supervises space-based remote sensing that is consistent with U.S. laws and international obligations, minimizes legal uncertainty and provides clear guidance to the private sector. This paper examines the current regulatory framework, identifies gaps and limitations, and proposes solutions.

II. Policy Drivers

The United States has four primary policy objectives when regulating space activities. First, the United States wants to ensure compliance with international law and the obligations the United States has assumed. Second, the United States wants to protect its national security interests. Third, the United States wants to control activities which may impact its foreign policy interests. Fourth, the United States wants to promote and foster a robust U.S. commercial space sector.

A. International Space Law Obligations

The United States is internationally responsible for national activities in outer space and for assuring that national activities are carried out in accordance with international law and the *Outer Space Treaty*.³ The activities of non-governmental entities, including U.S. private on-orbit remote sensing (ORS) systems, require U.S. government (USG) authorization and continuing supervision.

B. National Security

Private sector ORS operations raise unique national security concerns and interests. Foremost among these is that private ORS operators may identify classified USG assets. The USG has an interest in regulating the operation of private actors as to ameliorate against identification of classified assets or other activities which would compromise the national security interests of the United States. It is also noteworthy that U.S. national security may be benefit from a regulated private U.S. space-to-space remote sensing operator. In the terrestrial space imagery community, companies such as DigitalGlobe provide valuable services that i) allow USG national technical means (NTM) to be tasked on more important activities, ii) allow the USG to share commercial imagery with allies without the administrative requirements of clearances associated with NTM imagery, and iii) the USG can release commercial images to the public without revealing USG national capabilities. Similar benefits may be accrued from commercial U.S. private sector space-to-space remote sensing operations.

C. Foreign Policy

² <http://comspoc.com/about/>

³ Article VI *Outer Space Treaty* (1967)

1st Annual Space Traffic Management Conference "Roadmap to the Stars"

Outer space is by its legal nature an international domain. No State exercises sovereign jurisdiction over outer space and all States are legally allowed to access, explore, and use outer space. The U.S. State Department coordinates USG space-related foreign policy positions and represents the USG in international settings (such as the United Nations). A US private ORS system implicates a number of foreign policy interests, including the interpretation and application of existing international agreements related to the peaceful use and exploration of outer space and arms control and verification.

D. Advancing the U.S. Commercial Sector

It is the national policy of the United States to support the growth and development of the U.S. private commercial space sector. According to the National Space Policy, the United States is committed to encouraging and facilitating the growth of a U.S. commercial space sector that supports U.S. needs, is globally competitive, and advances U.S. leadership in the generation of new markets and innovation-driven entrepreneurship. Agencies are directed to minimize, as much as possible, the regulatory burden for commercial space activities and ensure that the regulatory environment for licensing space activities is timely and responsive. In pursuit of its national space programs, the USG is to energize competitive domestic industries to participate in global markets and advance the development of satellite manufacturing, satellite-based services, space launch, terrestrial applications, and increased entrepreneurship. Departments and agencies are directed to purchase and use commercial space capabilities and services to the maximum practical extent when such capabilities and services are available in the marketplace and meet United States Government requirements.

III. Current U.S. Law and Regulation

The United States fulfills its obligations to authorize and supervise space activities through licensing regimes at National Oceanic and Atmospheric Administration (NOAA), the Federal Communication Commission (FCC), and the Federal Aviation Administration (FAA). NOAA licenses private remote sensing space systems, the FCC licenses the operation of space stations that transmit radio signals, and the FAA licenses the operation of launch and re-entry vehicles and sites.

However, there is currently no clear legal or regulatory authority to authorize and supervise U.S. private space-based on-orbit remote sensing (ORS) systems. The National Oceanic and Atmospheric Administration (NOAA) is the Federal Government agency authorized to license private sector space-based remote sensing operators. NOAA's current statutory authority to regulate private remote sensing systems is derived from the *Land Remote Sensing Policy Act of 1992* (as amended) ["the Act"]. The Act provides that "the Secretary of Commerce ("Secretary"), in consultation with other appropriate United States Government agencies, is authorized to

1st Annual Space Traffic Management Conference "Roadmap to the Stars"

license private sector parties to operate private remote sensing space systems for such period as the Secretary may specify and in accordance with the provisions of this subchapter.”⁴

NOAA’s current regulatory practice is that NOAA has authority under The Act to regulate any private remote sensing space system that is sensing the Earth’s surface, as currently defined in its regulations. NOAA regulates “private remote sensing space systems” [System] through a licensing regime that allow the licensee to operate its space system consistent with the terms of the license. The functional regulatory terms of the license are operational, i.e. NOAA imposes conditions and parameters on the *operation* of the System and that licensee must follow. NOAA regulations define “private remote sensing space system” as:

“any device, instrument, or combination thereof, the space-borne platform upon which it is carried, and any related facilities capable of actively or passively sensing the Earth’s surface, including bodies of water, from space by making use of the properties of the electromagnetic waves emitted, reflected, or diffracted by the sensed objects. For purposes of the regulations in this part, a licensed system consists of a finite number of satellites and associated facilities, including those for tasking, receiving, and storing data, designated at the time of the license application. Small, hand-held cameras shall not be considered remote sensing space systems.”⁵

Under current NOAA regulations, an ORS system could arguably not fall within the definition of a “private remote sensing system” and therefore fall outside the scope of NOAA’s regulatory authority. As a result, the United States would not be able to fulfill its international obligation to authorize and supervise or protect its national security and foreign policy interests absent other actions by the USG to fill this regulatory gap. As a result, today private U.S. entrepreneurs face significant legal and regulatory uncertainty as they seek to finance, develop, and ultimately operate their ORS system, potentially inhibiting their ability to bring their start-ups to an operational reality.

IV. Ways Forward

If the USG chooses to advance the U.S. commercial space-to-space remote sensing industry by authorization and supervision of such activities that satisfy U.S. national security and foreign policy interests, there are a number of ways the USG could seek to ameliorate the current regulatory lacuna, including:

- Interpret NOAA’s existing regulations: It is possible that a legitimate interpretation of NOAA’s existing regulations would allow NOAA to exercise regulatory jurisdiction over private space-to-space remote sensing so long as they are *capable of remotely sensing the*

⁴ 51 U.S.C. § 60121 (a)(1)

⁵ 15 C.F.R. §960.3

1st Annual Space Traffic Management Conference "Roadmap to the Stars"

Earth. This approach will only work if NOAA can withstand judicial scrutiny under the Administrative Procedures Act pursuant to the principle of the *Chevron* Deference. *Chevron* deference is a principle of administrative law requiring courts to defer to interpretations of statutes made by those government agencies charged with enforcing them, unless such interpretations are unreasonable.

- Amend NOAA's Regulations: NOAA's regulations could be amended to provide a clear definition of remote sensing system that *includes* space-to-space systems. This approach will only work if legitimately NOAA can interpret that it has authority under 51 U.S.C. §60121(a)(1) to license private sector parties to operate private on-orbit remote sensing (ORS) systems.
- Amend 51 U.S.C. §60121(a)(1): If the USG determines that NOAA does not have legitimate authority under 51 U.S.C. §60121(a)(1), Congress can amend NOAA's enabling legislation to explicit provide for authority to regulate space-to-space remote sensing.
- Via legislation grant FAA-AST on-orbit regulatory authority: As an alternative to strengthening NOAA's regulatory and/or legislative authorities, FAA-AST's could be granted some type of on-orbit authority. For example, FAA-AST could be authorized to supervise on-orbit missions, providing oversight over any number of on-orbit activities including space-to-space remote sensing, private manned space operations, and celestial resource prospecting and extraction. FAA-AST does not currently have this authority in their enabling legislation. Congressional legislation would be required.
- Authorize regulation via an Executive Order (EO) of the President: There are historical instances in which Executive Orders have been used to remedy regulatory deficiency. For example, EO 12465 established the original authority for the FAA-AST as a clearing house of regulatory approval for U.S. private operators seeking USG approval, to improve procedures and facilitate inter-agency coordination. However, EO 12465 did not grant the FAA the authority to regulate. Establishing an EO which grants explicit regulatory authority not provided for in enabling legislation would require an interpretation of either Presidential power pursuant to the Constitutional authority vested in the President or upon other legislation which the President could legitimately rely upon.⁶
- Voluntary on-orbit operational standards coupled with launch and frequency authorization and supervision: The USG has discretion in its interpretation of Article 6 *Outer Space Treaty* authorization and supervision obligation. It is possible the USG could interpret its obligation to be fulfilled via explicit regulatory authorization provided under existing authorities (e.g. FAA, FCC), coupled with voluntary operational standards that U.S. operators follow (e.g. Memorandum of Understanding with the Department of Defense regarding ORS operations that implicate classified U.S. space assets). If legislative and/or regulatory relief is not immediately available, this approach could provide a stop-gap measure that allows US companies to move forward with their activities, while providing the USG appropriate assurances that its national security and foreign policy interests are addressed. One significant challenge to this approach is the potential national security sensitivities that on-orbit SSA operations present and the lack

⁶ For example, it could be argued that the President has authority under the International Emergency Economic Powers Act, if the circumstances were appropriate, to promulgate regulations governing U.S. private space-to-space operations.

1st Annual Space Traffic Management Conference "Roadmap to the Stars"

of enforcement mechanisms to enforce operational conditions to protect national security interests.

V. Conclusion

U.S. companies are developing technologies and business models that support commercial on-orbit space-to-space remote sensing operations and services. Current U.S. regulations do not explicitly authorize or supervise such activities. U.S. national space policy directs the USG to promote U.S. space commercial activities while balancing national security and foreign policy interests. If a regulatory mechanism is established to provide authorization and supervision, the USG will be in a better position to support the development of a U.S. commercial remote sensing space-to-space services industry while ensuring that any activities undertaken by U.S. private operators is consistent with U.S. national security and foreign policy interests. There are number of possible mechanisms the USG could rely upon to achieve this goal, some of which are identified in this paper. If the USG fails to resolve this regulatory lacuna, it is possible that the U.S. space-to-space remote sensing industry will not develop in a timely fashion and that foreign competitors will take the lead. This would be similar to the historical precedent established in the 1990s when U.S. companies seeking to offer commercial radar imaging failed to receive regulatory approval.⁷

⁷ To date there is no U.S. space-based commercial radar imaging service and foreign companies, such as Terrastar and RadarSat, monopolize this commercial market.