Before the
DEPARTMENT OF COMMERCE
Washington, D.C. 20230

In the Matter of	)	
	)	
Request for Information on	)	**RIN 0690–ZA03**
Commercial Capabilities in Space	)	
Situational Awareness Data and Space	)	
Traffic Management Services	)	

COMMENTS OF THE CONSORTIUM FOR THE EXECUTION OF RENDEZVOUS AND SERVICING OPERATIONS

I. INTRODUCTION AND SUMMARY.

The Consortium for Execution of Rendezvous and Servicing Operations ("CONFERS") is an industry-led initiative that advocates globally for commercial On-Orbit Servicing (OOS) as an integral part of a robust space economy. As an essential underpinning of that advocacy, CONFERS aims to leverage best practices from government and industry to research, develop, and publish non-binding, consensus-derived principles, practices, and technical and operations standards for OOS and Rendezvous and Proximity Operations (RPO). These standards would provide the foundation for a new commercial repertoire of robust space-based capabilities and a future in-space economy.

CONFERS has been developed by a team of private sector organizations with initial funding from the Defense Advanced Research Projects Agency (DARPA). Advanced Technology

International (ATI) is providing overall program management. Technical expertise and project execution support is being provided by the Secure World Foundation (SWF), the University of Southern California's Space Engineering Research Center (SERC), and the Space Infrastructure Foundation (SIF).

To fulfill its mission, CONFERS is recruiting a broad array of members from satellite equipment manufacturers, satellite operators, service providers, developers of RPO simulation, planning and safety tools, and insurers; interacting with standards development organizations; and engaging other stakeholders from industry, academia, and governments. CONFERS currently has 26 industry members from the United States and abroad. The process is fully collaborative and includes dedicated outreach activities to the global commercial satellite and space community.

We appreciate the efforts of the Trump Administration and the Department of Commerce to develop and implement the first national policy on space traffic management (STM)[1] and in particular the focus on leveraging the capabilities and innovations of the commercial sector in enhancing civil space situational awareness (SSA) and STM. To that end, we offer the following comments in response to the recent Request for Information on Commercial Capabilities in Space Situational Awareness Data and Space Traffic Management Services. [2]

II. Commercial Enhanced SSA/STM Capabilities

Our members are working on developing a variety of commercial technologies, capabilities, and services that could directly benefit civil SSA and STM. One major area of impact are technologies for the identification, tracking, and inspection of other space objects. These commercial capabilities would complement existing public and private sector ground-based capabilities by providing more detailed and comprehensive data to help identify and resolve on-orbit anomalies and increase the accuracy and precision of SSA decision-making data. A second major area of impact are technologies for on-orbit life extension, repair, refueling, and end-of-life disposal of satellites. These commercial capabilities would provide additional tools for satellite operators and regulators to more efficiently manage satellites and constellations, provide new orbital debris mitigation techniques, and removal of legacy orbital debris objects.

Regarding making the United States the "flag of choice" for commercial entities, our members believe that the existing orbital debris mitigation requirements should be as streamlined and harmonized as possible across the U.S. government. Currently, three different U.S. government

[1] "*Space Policy Directive 3: National Space Traffic Management Policy*," White House, June 18, 2018, retrieved from https://www.whitehouse.gov/presidential-actions/space-policy-directive-3-national-space-traffic-management-policy/

[2] "*Request for Information on Commercial Capabilities in Space Situational Awareness Data and Space Traffic Management Services*," United States Department of Commerce, April 11, 2019, https://www.regulations.gov/docket?D=DOC-2019-0001

entities - the National Oceanographic and Atmospheric Administration in the Department of Commerce, the Federal Aviation Administration in the Department of Transportation, and the Federal Communications Commission - all require some form of orbital debris mitigation plan in their satellite license applications.

Our members urge the U.S. government to consider consolidating the orbital debris mitigation guidelines into a single framework under a single agency. Our members are agnostic as to which agency that is, only preferring that whatever agency is chosen is given authority to implement the orbital debris mitigation guidelines across all U.S. private sector space activities equally and has the resources to carry out this responsibility. We also believe the same orbital debris mitigation guidelines should be required of foreign companies seeking market access or a business presence in the United States and that the United States should work to promulgate its national orbital debris mitigation guidelines internationally.

Additionally, we urge the Department of Commerce to work with other U.S. government departments and agencies to create an oversight framework, including STM, that provides more certainty to commercial endeavors. Many current areas of commercial space innovation and expansion, including satellite servicing, do not fit cleanly into the existing U.S. licensing framework, creating uncertainty over how companies will be able to efficiently and quickly receive a U.S. license or over what, if any, license they need at all. Modernizing this framework by creating a clear path for the U.S. government to say "yes" to new and innovative commercial space activities will provide a positive signal to insurers and investors that will in turn encourage the United States to be the "flag of choice" for industry.

III. STM, SSA, and Orbital Debris Mitigation Best Practices

The Consortium strongly believes that future best practices, technical guidelines, minimum safety standards, behavioral norms, and orbital deconfliction protocols should be based to the extent possible on commercial practices and standards. To that end, CONFERS is actively working with our members to develop recommended practices and technical safety standards related to commercial RPO and OOS.

In November 2018, our members approved the first set of CONFERS Guiding Principles for Commercial RPO and OOS ("CONFERS Principles"), which emphasize the importance of consensual operations, compliance with relevant law and regulations, responsible operations, and transparency as the core elements of commercial RPO and OOS.[3] In February 2019, our members approved the first set of CONFERS Recommended Design and Operational Practices

[3] *Guiding Principles for Commercial Rendezvous and Proximity Operations (RPO) and On-Orbit Servicing (OOS)*, Consortium for the Execution of Rendezvous and Servicing Operations, Nov. 7, 2018, https://www.satelliteconfers.org/wp-content/uploads/2018/11/CONFERS-Guiding-Principles_7Nov18.pdf

("CONFERS Practices") that added further detail to how industry should implement those principles to enhance operational safety and success.[4] The practices represent lessons learned from prior servicing operations, which have historically been conducted by governments, and are intended to evolve based upon experience gained through future commercial and government servicing operations.

CONFERS is actively working to promulgate these principles and practices internationally. Our membership includes companies from the United States, Canada, Japan, Germany, the United Kingdom, and France. In April 2019, we worked with the U.S. delegation to the International Organization for Standards (ISO) to submit a draft standard on "Rendezvous and Proximity Operations (RPO) and On Orbit Servicing (OOS) – Programmatic Principles and Practices" to ISO Subcommittee 14 on Space Systems. We also have on-going engagements with several national governments to discuss incorporating industry best practices into national regulatory frameworks.

IV. Appropriate SSA/STM-Related Regulations to Spur U.S. Space Commerce

From the perspective of CONFERS, one of the biggest obstacles to commercial innovation is export controls. The commercial space industry is undergoing a period of drastic change. Spin-in technologies from other domains, significant increases in private sector funding, and increased government leveraging of commercial capabilities and services are driving the space industry to rapidly innovate, adopt emerging technologies, and explore new capabilities and markets.

The rapid innovation and change in the space industry are particularly evident in the commercial satellite servicing sector. Dozens of U.S. and foreign companies are current investing in developing the technologies for on-orbit inspection, docking, berthing, relocation, refueling, life extension, repair, upgrade, deorbit, refueling, and assembly of satellites and other space objects. Some of our members have already signed agreements with other commercial or governmental entities to provide such services and plan to do initial demonstrations as early as 2020.

The ever-changing nature of space technology means that the categorization of technologies enshrined in the United States Munitions List (USML), managed by the Department of State, and Commerce Control List (CCL), managed by the Department of Commerce, must also constantly evolve. Therefore, the Department of Commerce, in conjunction with other federal departments and agencies, must execute regular and mandatory reviews involving industry feedback on necessary changes to both lists. The Department of Commerce should liaise with industry to determine the appropriate time interval between reviews.

[4] *CONFERS Recommended Design and Operational Practices*, Consortium for the Execution of Rendezvous and Servicing Operations, Feb. 1, 2019, https://www.satelliteconfers.org/wp-content/uploads/2019/02/CONFERS-Operating-Practices-Approved-1-Feb-2019-003.pdf

CONFERS members believe that some or all of the technologies, services, and information related to commercial satellite servicing should be transitioned from the USML to the CCL. However, not all member organizations have had the opportunity to produce a detailed response on this topic before the RFI deadline. Therefore, CONFERS hopes that the Department of Commerce and other relevant departments and agencies will engage in an ongoing dialogue with CONFERS to discuss necessary changes to ensure this critical industry flourishes.

A second major obstacle to continued growth of the commercial satellite servicing are the restrictions on non-earth imaging (NEI) in existing commercial remote sensing (CRS) licenses. Historically, CRS licensees were generally prohibited from imaging other space objects, except for specific celestial objects for scientific or calibration purposes. In 2017, NOAA relaxed the overall prohibition to allow some forms of NEI but with significant restrictions.

While we applaud the effort to relax historical conditions on NEI, we also urge the US government to reconsider imposing any operational restrictions on commercial NEI. The previous two decades of imposing restrictions on CRS showed that such efforts are likely to have negative impacts on industry and in particular the on-orbit servicing market. CRS restrictions reduced commercial sales of imagery products and limited the operation of licensed systems in modes that were already substantively employed on-orbit. CRS restrictions were harmful to the competitiveness of U.S. industry and commerce and helped fuel the development of international alternatives. For example, historical restrictions on U.S. commercial radar imagery help create a vibrant global marketplace for non-U.S. companies to offer what U.S. companies could not.

We foresee similar potential negative impacts from the proposed NEI restrictions on the emerging commercial SSA industry. The current NEI restrictions severely limit the ability of U.S. licensees to provide space-based SSA capabilities that could enhance existing governmental and private sector SSA capabilities. Specifically, the NEI restrictions limit the ability to perform space-based SSA to support scientific studies of the orbital debris population, assist with tracking and identifying newly-launched objects, tracking fragments from new breakups and collisions, helping diagnose and resolve on-orbit anomalies, conduct safe rendezvous and proximity operations, and contribute to monitoring or reinforcing norms of behavior on orbit to support current U.S. national policy goals.[5]

We believe the existing restrictions on NEI will stifle development of commercial on-orbit satellite servicing capabilities and place U.S. companies at a disadvantage relative to their international competitors. The current restrictions limit the ability of U.S.-licensed operators to experiment and test out technologies and concepts of operations (CONOPS) to make these new

[5] White House, "National Space Policy of the United States of America," June 28, 2010, retrieved from http://obamawhitehouse.archives.gov/sites/default/files/national_space_policy_6-28-10.pdf

capabilities and services feasible and explore business models. At the same time, there are international companies who are also developing similar on-orbit NEI capabilities and services, and who are not encumbered by the proposed restrictions.

Respectfully submitted,

/*signed*/

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