Title: “Considerations for global maritime-space cooperation in the Asia-Pacific”

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Remarks:

Hello. It is my honor to be speaking here at the “International Symposium on Maritime-Space Cooperation in Asia-Pacific Region.” Thank you to the Ocean Policy Research Institute of the Sasakawa Peace Foundation and the Space Policy Research Center of the Japan Space Forum for inviting me to speak today. My organization is the Secure World Foundation (SWF), a private operating foundation that promotes the long-term sustainable use of outer space. SWF works with governments, industry, international organizations, and civil society to develop and promote ideas and actions for international collaboration that achieve the secure, sustainable, and peaceful uses of outer space. We use a cooperative, international approach to promote best practices and norms of behavior that will allow us to continue to have access to and use of space over the long-term. Our interest in maritime-space cooperation is derived from our mission to promote space for human and environmental security.

I will focus my remarks today on three main issues. The first are considerations to keep in mind when sharing space-derived data for maritime domain awareness (MDA). Next, I will speak about issues in space situational awareness (SSA) data-sharing that may provide warning of possible complications that MDA data-sharing may face. Last, given the growing interest in space-derived MDA, I will speak about broader space policy issues that this community should be aware of.

MDA is can be defined as effective understanding of anything associated with the maritime domain that could impact security, safety, economy, and environment. MDA relies on a layered set of terrestrial, air-borne, and space-borne systems. Satellites can play an important role in MDA, including optical and radar imaging satellites, as well as satellites that carry receivers for the Automatic Identification System (AIS) created by the International Maritime Organization (IMO) and even commercial satellites which can collect radiofrequency signals. With the rise of commercial Earth observation constellations, we are seeing much higher revisit rates with less exquisite architecture, which is allowing for an explosion of usable MDA data points. As well, many of the satellites being launched as part of the smallsat revolution are providing Earth observation capabilities that could be used to improve MDA. Some of these systems carry synthetic aperture radar, which can see through bad weather and during day and night. Space-based solutions are helping to close the gap for knowledge of what is on the oceans.

Some complications to sharing space-derived MDA data are that sometimes there are a lack of training and/or a limited patrol response that is possible. As well, even with a multi-layered approach, there can be gaps in coverage. Furthermore, space-based MDA data suffers from the same problems that all data sources suffer: latency issues, the potential for deliberate spoofing or interference, validation of data, and concerns about bias of the data collector.

There also is the need to improve data analytics. Data that is collected is only useful if we know what to do with it, and even in our current space domain configuration, we run the risk of being inundated with too much data. Big data analytics are going to be crucial to being able to fully take advantage of the benefits that these space applications can bring to MDA. As well, while data is useful, it in and of itself is

not going to provide decision-making support. It is the foundation for it, but you cannot stop just at sharing data. One option might be to get your data, apply machine learning to it in order to determine behavioral patterns, and overlay it on the regulatory context in order to produce real-time decision-making support at the operational level.

Now, I would like to discuss space situational awareness (SSA) and issues in international cooperation and data-sharing that may prove helpful in identifying potential complications for sharing space-derived MDA. SSA is the knowledge and characterization of space objects and their operational environment to support safe, stable, and sustainable space activities. This is done to operate safely and efficiently; avoid physical and electromagnetic interference; detect, characterize and protect against threats; understand the evolution of the space environment; and provide awareness and transparency of space operations. Most space actors do not have the resources or capacity to provide their own SSA, but instead rely on the U.S. military to send them notifications of potential close approaches to their satellites, or conjunctions.

In the past several years, there have been two big changes in the SSA domain. The first is that the U.S. government is seeking to change which government entity is responsible for collecting and disseminating the data. We are potentially shifting to a system where instead of Strategic Command being in charge of sending out notices to operators, it may be a one-stop shop at the Department of Commerce. This is still being worked out, as Congress has not authorized this change yet. The second is the proliferation of SSA capabilities, both by other countries and also by commercial SSA providers.

The latter has prompted discussions about the essential nature of SSA. Is it necessary for spaceflight safety, and thus a public good that the government should provide at least a basic level of? How can the government encourage the commercial sector to invest in SSA if they will be competing with the public provision of free data? There is also the question of transparency of the data sources: how can you verify the data's authenticity? What is the liability of using commercially provided SSA? How do you combine multiple sources of data that use different formats? And finally, how do you share data without bumping into national security considerations, given that much of space information is almost reflexively classified?

Finally, I would like to use the few minutes I have remaining to discuss some of the broader space policy issues that the MDA community should be aware of as space becomes increasingly important to MDA. The space domain is undergoing a significant set of changes. A growing number of countries and commercial actors are getting involved in space, resulting in more innovation and benefits on Earth, but also more congestion and competition in space. From a security perspective, an increasing number of countries are looking to use space to enhance their military capabilities and national security. The growing use of, and reliance on, space for national security has also led more countries to look at developing their own counterspace capabilities that can be used to deceive, disrupt, deny, degrade, or destroy space systems.

The existence of counterspace capabilities is not new, but the circumstances surrounding them are. Today there are increased incentives for development, and potential use, of offensive counterspace capabilities. There are also greater potential consequences from their widespread use that could have global repercussions well beyond the military, as huge parts of the global economy and society are increasing reliant on space applications.

Another disruption to the space domain is the emergence of new actors. During the Cold War, space was largely the province of only a few states. However, there are now over 80 countries that have access to satellites. Small satellites, or smallsats, have lowered the cost of entry to space. As of March 2019, there were 2062 active satellites. Earlier this year, we also saw the first launches of what have been called mega-constellations. We have the potential for the addition of 20,000 more satellites in Earth orbit in the near future, which will hugely change almost everything of how we operate in and from space. Another complication is that the mega-constellations are being launched by commercial companies, which means that space will be shifting from being dominated by nation-states to one where the commercial sector is preeminent. This will make global governance discussions challenging, as multilateral fora historically have only allowed the participation of nation-states.

Finally, we have the growth of space debris, which can remain on orbit for decades, if not longer, and impede the use of certain orbits. Right now, the U.S. military tracks around 24,000 objects with a diameter of 10 cm/higher, but with a new radar coming online soon, that number could jump to 100,000 objects.

We are at an inflection point for the use of space. Thoughtful, international, and cooperative considerations of these challenges now can help set the standards and norms to ensure that space is usable for and accessible to all in the long-term for maritime security needs. Thank you for your time and attention.