Ideas

Space Exploration: A Bold New Legal Frontier

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▶Thomas McCarthy, partner with Akin Gump, talks about the incredible advances that have been made in the field of space exploration, what the laws and regulatory landscape around the industry look like today, and where it's all going in the future.

CCBJ: Please provide us with some background on commercial and government space-exploration activities and how the industry has changed recently.

Thomas McCarthy: Until the last decade or so, governments led and dominated the industry. While governments still play the pivotal role in generating demand for launch, satellite, and spacecraft activities, in the last decade or so there has been an unprecedented growth of demand in the commercial sector. It's been led by innovators across all parts of the industry, including launch services providers developing rockets without an initial customer or specific mission, and there's a hunger for everything from low-Earth orbit space exploration all the way out to deep space.

The demand is being generated by new manufacturers, investors, and customers who are creating a range of opportunities in space to improve historic space activities and create new products and services – what is loosely known as "new space" or the new space economy. In the 1990s and 2000s, you had an industry that was largely focused on delivering government projects, both military and civil, into the atmosphere and space. There were commercial satellites to some extent too, of course, but now there's a real hybrid of private sector and government growth. It's created a model that has invited the expansion of the industry and brought a number of new actors into play.

What types of companies are engaged in the space industry?

Historically, the industry has been broken up into launch service providers and satellite companies. Those are really the drivers. When I say satellites though, I should probably expand that to spacecraft, which can include other types of vehicles beyond those that orbit the Earth. But those two types of companies have had a long-standing presence in the industry.

There's typically been a fairly narrow view of the possibilities within launch services and satellites, deriving largely from the needs and demands of the government and, to some extent, government contracts. Over the past 25 or 30 years, uses for other types of private satellites have grown, particularly in the telecommunications and sensor industries.

Growth in the private sector in satellites began in the 1990s and continues today. But what has changed is that the technology and the possibilities have opened up quite significantly. For example, the types of players involved on the launch vehicle side and the rocket-making side have expanded significantly. We've seen multiple startups on the launch vehicle side doing very exciting things with new technologies, new types of propulsion and new manufacturing techniques, such as additive manufacturing. As a result, there have been remarkable advances in terms of driving down costs, led by companies that are reusing rockets, including the first stage of the rocket, landing them back on Earth.

On the other side of it, satellites have evolved in really interesting ways as well – meaning the types of satellites, as well as the sizes of the satellites, which are being shrunk down into microsats and even nanosats. It has allowed many new and interesting market entrants in those fields. With smaller satellites, you can have more that go on single rocket launches. So the ability to push different types of satellites and spacecraft up into orbit and beyond has increased, for all of those reasons.

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In addition, you have people looking at deep space solutions, for exploration, transportation, refueling and resource extraction, beyond just lower Earth orbit. There have been a great deal of new entrants in these areas over the past decade, and then obviously supply chain entrants there as well. Those are the companies that make much of what go into rockets and satellites, which you might not know are part of the space industry. So the industry itself has grown as a result of the increased numbers and types of companies that are involved in manufacturing and producing, designing, and providing services around these new activities.

What kinds of government bodies are involved in the industry, and how do they interact with each other?

In the United States, by example, you have two types of government bodies. There are the actors – meaning the types of entities that are actually procuring, facilitating and leading space activities – but you also have the regulators of space-related activities.

The government actors generate demand through design, development, and procurement of space products, technology, and services. The most famous is NASA, which historically has overseen civil government space activities and is the most well-known of all the agencies. On the military side, the U.S. Air Force and

now the Space Force drive much of the military space activities that are undertaken in the United States. These agencies look to create projects and programs and then procure services and products, such as launch services, satellites and spacecraft, from the private sector by engaging in partnerships with them. Like many private actors, they can be subject to oversight by regulators, which can lead to interesting dynamics within the government on space issues.

On the regulatory side, you have entities like the Federal Aviation Administration, which is part of the Department of Transportation, as well as the National Oceanic and Atmospheric Administration, which is within the Department of Commerce. You also have the Bureau of Industry and Security, the Directorate of Defense Trade Controls, the Federal Communications Commission, to name a few, all of which have a regulatory role in managing the rules around what companies and government entities engaged in space-faring activities are allowed to do and what kinds of requirements they need to follow.

Then there are the agencies that are involved in the types of activities that are inherent to regulating any manufacturing, design and other big industrial endeavors in the U.S. That includes environmental health and safety and labor laws, equal employment and then, of course, a range of other agencies, such as the Department of Justice and Homeland Security, that are keenly interested in the national security aspects of what companies in the space industry are doing.

I'll also note that one other agency, the National Space Council, which is a White House–appointed council that was revived under the Trump administration and is now being continued under the Biden administration, is responsible for establishing and executing a coherent national space policy across the government. The Council is intended to coordinate the activities of all of these various bodies in the U.S. Government in furtherance of this objective. The Trump administrtion set a number of goals in terms of promoting U.S. leadership in space, and, while there were questions about whether the Biden administration would proceed with the National Space Council, it's something the Biden administration is continuing – President Biden even has a moon rock in the Oval Office, which many take as a good sign.

What are some relevant areas of law that affect participants in the space industry?

Our clients in the space industry are working on highly sensitive items, such as rockets, satellites, and the sensors and other things that go along with those items. As you can imagine, governments are keen to make

sure that those technologies, which can have national security implications, are regulated and controlled. So, one of the areas that's a concern for a lot of companies in the space sector is U.S. export controls and U.S. foreign investment in the United States, as well as classified national security programs, which often intersect with the work they do with the Air Force or the Space Force.

There are a number of other highly specialized legal areas that apply to space activities. Insurance, for example – there are special requirements for launches and other aspects of doing business in space. In addition, telecommunications is absolutely critical and is affecting the way that communications flow between items in space and the ground, whether in the private or public sector. Other relevant areas include the federal aviation law, which governs launches, government and commercial contracts, and intellectual property.

There are also interesting new areas where companies are running into a need for legal services. Maritime law, for example, when they're doing launches in the middle of the sea, or recovering spacecraft and objects that fall from the sky into the ocean. How do you deal with items that are falling from the sky into the waters of a particular country? There are a lot of interesting questions. One of the most interesting, I think, as we go out onto the moon and toward Mars, is that companies and governments have to ask, "Do we refresh our international treaties governing the way we look at the moon and Mars and the way that those bodies are managed, including their resources?"

It's another new frontier, if you will, from a legal perspective. There are ways that the legal community and academics are examining those questions, to determine what's the best framework and what the good points of references are. For example, the treaty governing Antarctica has been discussed as an example of the way we should manage the moon and Mars and asteroid exploration. The international community has been able to sit on these treaties without any real

movement or discussion in the framework for fifty years because there simply has not been significant change in the industry – until recently. The same unanswered questions about private actors and activities in space remain unsolved. But change is here, and the way these debates play out will invariably affect the opportunities, requirements, and restrictions that apply to space industry actors.

What are key legal considerations and priorities for companies entering or operating in the space industry?

The capital costs are high, although they are dropping. There are a lot of long-standing commercial barriers to market entry that are now diminishing, which makes it inviting to jump into this growing and exciting area. But there are still legal barriers. You have to realize that you're entering a highly regulated industry, as just mentioned, where specialized laws and policies can change quickly.

Space industry companies need to have the right legal bench as you're entering this market. Look at how you're staffed to protect key areas and comply with the law to ensure that your growth is promoted by good and sound legal support within your company - that is really, really important to the success of companies in this area. Government and commercial partners expect it. Don't be caught off guard or surprised by requirements or demands in these various areas. For smaller companies, determining and securing the right mix of legal support and staffing can be challenging, especially when the contributions to urgent and visionary extraterrestrial business goals may not be readily obvious.

But as you're looking to grow globally – personnel staffing, facilities, customers, supply chain – all of those international activities have an important legal component, both a contractual component but also a regulatory component, because of the national security and other related aspects of doing business in this industry. Think about your business model, think about your goals, and look at the various regulatory areas to make sure you're not going to find yourself exposed inadvertently or becoming the subject of an investigation by the U.S. government, the FBI, the Departments of Commerce, State, Homeland Security or any other agency.

How can companies and governments meet those barriers and challenges?

Companies, as I mentioned, really have to invest in ensuring, from a legal perspective, that they are keeping up with the changes that are occurring within the different agencies. They have to be prepared not only to continue to innovate in the exciting ways that they're doing but also to engage effectively with the agencies to help shape policy, so that their innovations and business models are not stifled.

At the same time, companies should be investing internally in legal resources to ensure that they have the right personnel models and the right talent – just like they do with engineers and other key people that drive their business – to help with the legal challenges in the various areas that are essential

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to growth. This includes intellectual property, national security issues, government contracts, litigation, public policy and a range of other areas.

Governments have a set of complex challenges to address as participants, policymakers, and regulators. They have to determine what they want the future to be in terms of the new space economy, exploration, international cooperation, and how space should be used – and not used. There are heady questions that intersect with basic questions about the direction not only of public resources but of humanity generally.

There's little debate, though, that the new space economy represents an opportunity for jobs, economic progress, and innovative technology - it is a vital economic interest at stake, and governments need to recognize and support the emerging new space industry. And I think they are taking steps to do that - at least the U.S. government domestically has – looking to modernize through the National Space Council and efforts within these different agencies that regulate the space sector. It will be very interesting to see whether they continue to modernize and how they meet the big challenge of the growth of the private sector in this area.

What excites you about the future of this industry, and how do you see it changing going forward?

I'm in awe of what this industry has done in the past decade, and it's just been amazing to watch it grow. To serve and work with the clients that we do at our law firm has really been an absolute pleasure and one of the highlights of my career.

The space program has a history of not only contributing to discoveries in fundamental and applied sciences. It has inspired people in unexpected ways to consider something bigger than ourselves. Think about the famous Earthrise photograph from Christmas Eve 1968 that helped launch the modern environmental movement. Consider the myriad benefits in a variety of fields on Earth, from lifesaving medical treatments to environmental and climate change monitoring to developments in energy.

A whole range of agencies are keenly interested in the national security aspects of what the space industry is doing.

I can't wait to see what the next decade brings. I believe it's going to yield exciting new developments in low-Earth orbit activities, and all the way out to the moon and Mars and beyond. There are incredibly difficult scientific and engineering problems associated with these ambitious goals. These will lead to more discoveries and innovations to improvements that inure to all of us. Watching that happen and seeing these companies solve some of the hardest problems that can be faced is just amazing. And these are being solved by people half my age who were not alive during Apollo. The torch is being passed.

Each of these innovations usually brings with it interesting new policy and legal problems, and that makes it fun and challenging for us to be part of. The information age took the baton from the old space age in terms of capturing the imagination of the public, but in a sense is now merging back into it, involving a wider range of people all over the world in the ability to become involved and contribute. How do we handle all of these new interactions, as there are more actors, more people in space and in places where we've never been before? The policy questions, the commercial relationships, and the regulatory requirements are headed towards more complexity in this area as the industry continues to create, grow, and thrive. ■