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IMPLEMENTATION OF INTELLECTUAL PROPERTY LAW ON THE INTERNATIONAL SPACE STATION

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Introduction

Historically, NASA has led the United States into many great new frontiers in space and technology. One such venture is underway with the building of the International Space Station (ISS). A few months ago, I had the opportunity to see the IMAX movie entitled "Space Station 3D." It provides a clear, up close view of the incredible beauty, complexity and sophistication of the ISS. It included a number of scenes documenting the astronauts and cosmonauts working inside and outside the ISS, which helped me to appreciate the difficult tasks that they perform on a daily basis. The ISS is truly a marvel of innovation, vision and international collaboration. As NASA's predecessor, the National Advisory Committee for Aeronautics (NACA) provided early leadership in aeronautics and provided the initial investment into what we now know as the commercial airline industry, we envision a similar development of commercial enterprise in space through the establishment of the ISS.

In the Commercial Space Act of 1998, the Congress of the United States declared that a "priority goal of constructing the International Space Station is the economic development of Earth orbital space". NASA's response to congressional declarations promoting free enterprise and U.S. economic development based on the International Space Station (ISS) can be found in NASA's Commercial Development Plan for the International Space Station. In this implementation plan, NASA set forth its short-term goal to "begin the transition to private investment and offset a share of the public cost for operating the Space Shuttle and Space Station...." NASA's long-term goal as set forth in the plan is to "establish the foundation for a marketplace and stimulate a national economy for space products and services in low-Earth orbit...." As Ralph Waldo Emerson said, "The future belongs to those who prepare for it." In the past few years, NASA has proceeded with implementation of the initiatives which

were set forth in this plan and received multiple commercial offers from industry. Our primary emphasis during this time has been to establish an efficient, "business-friendly" operation for entering into agreements with industry for ISS economic development opportunities.

Innovation and Economic Development

One of the primary methods by which the ISS will create new economic value is through the creation of intellectual property and capitalization of business enterprises involved in licensing new innovations and inventions and developing new commercial products and services. The space environment provides opportunities for research and development that are unmatched anywhere else. The micro-gravity and ultra-vacuum environments of space provide unique opportunities for advancing our understanding of physical and molecular dynamics. Commercial opportunities exist in using the Space Station for research and development, for operation and servicing of the ISS infrastructure, and for development of new capabilities to augment the ISS. Media services and sponsorships may also be near-term commercial opportunities. Industry's involvement in the economic development of the ISS has been part of NASA's vision since the space station was conceived. Protection and ownership of intellectual property are critical to the success of most businesses, especially for those involved in research and development efforts through collaborative business relationships. In speaking with potential commercial users of the ISS, one area of strong interest was how their existing intellectual property was going to be protected and how new innovations and inventions were going to be treated in the international environment of the ISS. In response to this interest, my office prepared a reference guide entitled, "Intellectual Property and the International Space Station: Creation, Use, Transfer, Ownership and Protection" which synopsizes and analyzes the intellectual property provisions in international agreements and U.S. laws that are applicable to the ISS program. The guide details the intellectual property provisions and explains how proprietary data and goods will be exchanged and protected on the way to, from and on the ISS. It is available on the NASA website at http://www.hq.nasa.gov/ogc/iss/main.html. Today, I will provide an overview of the system of agreements, regulations and provisions that set forth the terms and parameters for the treatment of intellectual property and how proprietary data and goods will be exchanged and protected in the ISS environment. I believe these will be of interest to those preparing to invest themselves and their organizations in the utilization of one of the most innovative and exciting facilities of our time.

Framework for Intellectual Property Rights

The five partners who have joined together for the development, operation and utilization of the International Space Station are Canada, Europe, Japan, Russia and the United States. These partners are joined in agreement through the Inter-Governmental Agreement (IGA). In addition to the extensive provisions and procedures within this agreement, NASA has a separate

Memorandum of Understanding (MOU) with each of the partners. The MOUs contain more specific provisions, but do not conflict with the terms set forth in the IGA. In total, these agreements place a premium on proprietary or commercially sensitive information exchanged during the development, operation and utilization of the ISS and establish strict procedures for protecting it.

An International Space Station in which each partner is isolated in its own module and has total control over its own equipment and experiments would be simple from the perspective of intellectual property rights. But that is not the situation on the International Space Station. For one thing, the International Space Station agreements provide for extensive access by the United States to the European and Japanese research elements. Moreover, the partners have the right to barter or sell any portion of their respective allocations to each other or to third parties. Thus, a U.S. based commercial experiment may be performed in or on a Japanese element. The IGA and MOUs attempt to address all the issues that could arise from such arrangements. Naturally though, it is impossible to write a document that can address every possible contingency that may occur in the future.

Limitations on Use and Disclosure of Data

Through the IGA and MOU, each Partner has agreed that they shall respect the proprietary rights in and the confidentially of properly identified and appropriately marked data and goods. Each Partner agrees to protect the marked proprietary data in accordance with the markings. A corollary principle, however, is that third party proprietary data which may be required in order for Partners to carry out their responsibilities with respect to developing, operating and utilizing the ISS will be kept to a minimum. In order to accomplish this goal, the Partners agreed in the IGA to the following provisions:

- Each partner shall respect the confidentiality of appropriately marked data and goods transported on its space transportation system and passing through its communication systems.

- Each partner shall transfer all technical data and goods considered to be necessary by both parties to fulfill the responsibilities of the other partner under the relevant MOUs and implementing arrangements.

- The transfer of technical data for the purposes of discharging the partners' responsibilities with regard to interface, integration and safety shall normally be made without restrictions. If detailed design, manufacturing, and processing data and associated software is necessary for interface, integration of safety purposes the transfer shall be made, but the data and associated software may be appropriately marked.

- Each partner shall take all necessary steps to ensure that the receiving partner and any other persons and entities including contractors and subcontractors shall treat technical data and goods received by it in accordance with all markings.

Each Partner has the explicit responsibility to ensure that its crewmembers comply with a Code of Conduct that has been developed and approved. The ISS Crew Code of Conduct is an enforceable obligation between the respective Partners and their crew members and provides that information obtained by a crew member in the course of performing his or her duties that is proprietary, confidential, or otherwise not generally available shall only be used for official purposes and shall not be used to further private interests. The IGA further stipulates that the withdrawal by a Partner from the ISS partnership shall not affect rights and obligations regarding the protection of technical data and goods, which were transferred under the Agreement.

In addition to our ISS Partners, U.S. civil service employees and U.S. Government contractors may come into contact with commercial data. As an employee of the Federal Government, a civil servant bears the responsibility for proper protection of proprietary data. Failure to take the proper level of protection may subject the employee to criminal penalty. Often working closely with civil servants, Government contractors are involved to some degree in almost all design, development and operational aspects of the U. S. space program, which specifically includes the ISS and the Shuttle programs.
One of the key factors for achieving proper treatment of proprietary or confidential data is that it be properly marked so those that come into contact with data are aware of its nature and the restrictions applied to the treatment of it. Within U.S. Government contracts, the Federal Acquisition Regulation (FAR) clause, 52.227-14, Rights in Data – General, addresses the rights to and protection of data. In general, all NASA contractors agree that to the extent they receive or are given access to data that contains restrictive markings, the contractor will treat the data in accordance with the markings.

Principles of Inventorship on the ISS

I have addressed the safeguards that the Partners have instituted in order to protect the existing intellectual property of commercial users of the ISS. Now, I would like to address the way in which new innovations and inventions emanating from research on the ISS will be treated in the international environment of the ISS.
With respect to patentable inventions the IGA and MOUs set out a framework for cooperation. For example:

- Article 21 of the IGA states that for purposes of intellectual property law, an activity occurring in or on a Space Station flight element shall be deemed to have occurred only in the territory of the Partner State of that element's registry. Thus, an invention made on a U.S. element will be deemed to have occurred in the United States and the entire U.S. Patent Law would apply.

- This is consistent with Article VIII of the Outer Space Treaty of 1967, which states that a party on whose registry an object is launched shall retain jurisdiction and control over that object and over personnel thereof. It also states that launching an object into space does not affect the objects ownership. Each element

of the Space Station is clearly an object over which a particular partner state has retained jurisdiction and control. In addition to jurisdiction for criminal activities or personal damages, a state can also extend its intellectual property laws to territories under its jurisdiction. The U.S. statute, 35 U.S.C. § 105, codifies this understanding by stating that "any invention made, used or sold in outer space on a space object or component thereof under the jurisdiction or control of the United States shall be considered to be made, used or sold within the United States for the purposes of this title." By the way, this also follows the analogy used under maritime law for ships at sea. If the International Space Station is going to become a research laboratory for commercial experiments, private entities will want an established body of law upon which to make business decisions. They will not risk millions of dollars without a clear understanding of their legal rights to technical data and innovations emanating from their investment. We have sought to provide this certainty for both the Space Shuttle as well as the territorial elements of the International Space Station. As a practical matter, what makes the situation on the ISS interesting is the close proximity of each Partners' laboratory. But, with the advent of collaboration by scientists over the Internet this is just a further extension of the issues that intellectual property attorneys deal with every day when they have clients involved in collaborative research with colleagues in different countries around the world. Luckily, there is consistency in one key aspect of the patent laws of all of the Partner countries. Each states that if an invention is made in their territory, a patent application must be filed in their patent office before filing in any other patent office, no matter what the nationality of the inventor.

- There are two concepts ingrained in the Space Station cooperation that may lead to interesting negotiations as we move toward more commercial opportunities. As you probably know, the Space Station crew will operate as one integrated team with one commander. The entire crew will operate under a single time line for performance of all operations and utilization activities. The integrated crew concept means that any crewmember, regardless of his or her nationality, could be assigned to perform any utilization activity. For example, a Canadian astronaut could be assigned to perform a U.S. based commercial experiment. If all of the legal requirements of inventorship are met for the territory in which the invention was made, the Canadian astronaut could become an inventor of an invention while working on the U.S. commercial experiment. The second complicating factor, which was mentioned earlier, is that the partners also have the right to barter or sell any portion of their respective allocations. Thus, a U.S. based commercial experiment may be performed in or on a Japanese element. If an invention were made during the course of the experiment, it would be deemed to have occurred

in Japanese territory under Japanese patent laws.

- Therefore, we may have a Canadian inventor making an invention while working on a U.S. commercial experiment while operating in the Japanese module. Japanese patent law would apply and the Canadian astronaut would have certain rights based upon his or her invention. Of course, the ability of an astronaut to invent would depend upon the amount of freedom the astronaut has in performing or modifying the experiment. If the experiment is fully scripted so that every step is set forth by the owner of the experiment, then the astronaut performing the experiment would have no opportunity to conceive an invention. This has been our experience on the Space Shuttle where each step of the experiment is scripted in advance. To date, no U.S. astronaut has obtained a patent for an invention made while flying on the Space Shuttle.

- With respect to patent infringement, the temporary presence doctrine, as reflected in the Paris Convention, provides an exception to patent infringement for the use of various articles or parts of a ship or aircraft temporarily in the territory of another State. Article 21 of the IGA extends the doctrine to articles, including the components of an ISS flight element, which are temporarily present in the territory of a Partner while transiting between Earth and the ISS. Thus, operation of an article in the United States (including the period of operation for pre-flight check-out, awaiting launch, and return to Earth) intended for the ESA-registered element would not form the basis for an action for patent infringement during the article's transit through the United States.

Based on the above legal framework and the generally accepted principles of patent, copyright and trade secret laws in the partner states, we have negotiated a number of related ISS agreements with other space agencies and with commercial entities. The intellectual property provisions of the arrangements are unique to the particular activity, and while consistent with the IGA provisions, they necessarily contain carefully tailored data rights and patent rights clauses to best accomplish the mutual goals of the parties involved. Most of these relate to barter arrangements in which one Partner provides ISS equipment in exchange for research time and resources owned by another Partner or one Partner provides launch capability in exchange for equipment, software or services. Additional agreements have also been negotiated to coordinate the provision of international life science research hardware for the ISS so as to avoid equipment redundancy.

All of the above mentioned agreements are consistent with the intellectual property clauses outlined in the IGA, MOUs and implementing arrangements. But in all cases, there are also issues that arise that are not specifically addressed in these documents, for example the rights to the data and inventions resulting from the activity. In each case, unique intellectual property clauses, tailored to accomplish the mutual goals of the parties involved, have been

created. These clauses have been negotiated based upon general principles of Intellectual Property Law, the contributions of the Parties and common sense. I have found that the basic legal framework for the ISS is a robust and effective set of principles that form a strong basis for negotiation. As time passes, there will be many more agreements and new issues which will evolve, but I believe that the basic legal framework that has been put in place will allow reasonable individuals to negotiate workable solutions to these issues.

As I stand here and try to predict how the legal documents related to the ISS will evolve and be handled, I am reminded of some others who have attempted to predict the future.

Thomas Watson, the chairman of IBM stated in 1943, " I think there is a world market for maybe five computers."

A senior engineer at IBM in 1968, commenting on the microchip, " But what is it good for?"

Ken Olson, chairman and founder of Digital Equipment Corp in 1977, " There is no reason anyone would want a computer in their home."

Western Union internal memo in 1876, " This telephone has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us."

Decca Recording Co, rejecting the Beatles in 1962, " We don't like their sound, and guitar music is on the way out."

Charles Duell, Commissioner of the US Patent Office in 1899, " Everything that can be invented has been invented."

It is interesting to note that before Orville Wright died in 1948, the first man to walk on the moon was already born. No one in the era of the Wright Brothers could possibly have conceived that we would not only fly, but also break the speed of sound and go off to the moon. We always have the tendency to overstate the short-term and underestimate the long term. There is no question in my mind that we will continue to underestimate what is in store for us in this new century. The ISS and other great endeavors will lead us into new technologies that we cannot even imagine at this time.

Thank you for your interest in the ISS.