

NASA & CONGRESS, MARS: OUR NEW HOME? – NATIONAL PLAN TO CONQUER THE RED PLANET (OFFICIAL STRATEGIES OF NASA & U.S. CONGRESS) (2017).

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Government Authorization for NASA's Incorporation of Private Commercial Providers in Its Mission to Send Humans to Mars

“Commercial partners, who are maturing their business models and technical approaches by providing critical services for the ISS, will be essential to enabling deep-space NASA missions.”¹

Nations have been sending astronauts into space since April 12, 1961 when the USSR sent Yuri Gagarin into orbit aboard the Vostok 3KA-3 spacecraft. Since 1961, sending spacecraft and astronauts into space was mainly a pursuit of Nation states, as they were the only actors with enough financial resources, capabilities, and incentives to pursue the activity. Now, almost 60 years later, the U.S. government is partnering with private commercial entities that also have the resources, capabilities, and incentives to not only send spacecraft, but also astronauts into space. Companies like Boeing and SpaceX have been awarded substantial contracts from NASA too not only send spacecraft with cargo to the International Space Station, but also to develop spacecraft and technology to send humans to Mars. Although these partnerships advance NASA's Martian interest, companies like SpaceX and Mars One, have their own sights on sending humans to

¹ NASA & CONGRESS, MARS: OUR NEW HOME? – NATIONAL PLAN TO CONQUER THE RED PLANET 133 (OFFICIAL STRATEGIES OF NASA & U.S. CONGRESS) (2017).

Mars to advance their interests, not those of the United States or NASA. The NASA contracts uniquely put SpaceX in a position that allows them to develop their own capacities in a way that will likely enable their own independent efforts to send humans to Mars. In *Mars: Our New Home?—National Plan to Conquer the Red Planet* written by NASA and the U.S. Congress, they describe and consolidate the U.S. plan and vision to effectuate human’s permanently living on Mars and review the current and proposed technological aspects of fulfilling the journey. Also included is the text of the “National Aeronautics and Space Administration Transition Authorization Act of 2017,”² which authorizes appropriations to NASA for fiscal year 2017 for exploration, space operations, science, aeronautics, space technology, education, safety, security, mission services, construction, environmental compliance, and the NASA Inspector General. They discuss the scientific steps and necessary developments to achieving their goals. They also outline the extent of Congressional funding authorization to award contracts to private companies and to what extent the national plan will rely on these services. A critical question arises from examining their presentation and the current abilities of these private companies; is the U.S. government enabling private companies, most notably SpaceX, with the ability to send humans to Mars independently?

NASA is an independent agency of the Executive Branch of the United States government. They are responsible for the civilian space program as well as aeronautics and aerospace research and have been operational since 1958. The United States Congress is the Legislative branch of the United States Government and consists of the House of Representatives and the Senate. The Act itself was sponsored by Senator Ted Cruz from Texas, was presented by the 115th United States Congress, the Speaker of the House of Representatives, the President of

² See National Aeronautics and Space Administration Transition Authorization Act of 2017, 115 P.L. 10 *hereinafter* Act.

the Senate, and the Vice President of the United States. It was approved into law on March 21, 2017. In *Mars: Our New Home?—National Plan to Conquer the Red Planet* they discuss U.S. national policy law regarding space exploration and program development to reach Mars as well as discussing the technological aspects and phases involved to make the plan a reality.

Mars: Our New Home?—National Plan to Conquer the Red Planet presents information about how NASA and Congress plan on sending humans to Mars by the 2030's. Congress represented in § 507 of the Act their policy and purpose as, "The search for life's origin, evolution, distribution, and future in the universe," while NASA represented its goal is to extend human presence deeper into the solar system and to the surface of Mars for people to work, learn, operate, and sustainably live safely.³ They are focused on human travel to Mars because they believe that Mars experienced huge floods about 3.5 million years ago and although they do not know where the ancient flood water came from, in 2002 NASA's Mars Odyssey orbiter detected hydrogen rich polar deposits, in 2004, Mars Exploration Rover Opportunity found evidence that liquid water once existed at its landing site, and in 2008, NASA's Phoenix Mars lander touched water ice in the Martian Arctic.⁴ These findings have led them to believe that Mars may have substantial subsurface layers of frozen water indicating large quantities of water ice close to the surface.⁵ The first three phases they enumerate on our journey to Mars are Earth Reliant (ISS operation through 2024, commercial development of low-Earth orbit, development of deep space systems, life support and human health), Proving Ground (2018-2030, regular crewed missions and spacewalks in cislunar space, verify deep space habitation and conduct a yearlong mission to validate readiness for Mars, demonstrate integrated human and robotic

³ See NASA & CONGRESS, *supra* note 1, at 133-148, 1291-1296.

⁴ See NASA & CONGRESS, *supra* note 1, at 37- 47.

⁵ See NASA & CONGRESS, *supra* note 1, at 40.

operations by redirecting and sampling an asteroid boulder), and Earth Independent (now-2030's and beyond, science missions pave the way to Mars, demonstrate entry, descent, and landing and in in-situ resource use, conduct robotic round-trip demonstration with sample return in the late 2020's, and send humans to orbit Mars in the early 2030's).⁶ Their presentation of this material is very succinct and although technical, presented in a clear and logical way so anyone interested can understand, not just scientists or academics. It was written so that the American public can familiarize itself with our nation's goal of sending humans to Mars and what technology we as a nation plan on using to achieve our goal.

Additionally, NASA and Congress address their plan and authorization of funding to partner with private U.S. commercial providers to reach their goals. They achieved this distinction of exclusive partnership with U.S. providers by authorizing commercial flights to the International Space Station while restricting the government from acquiring any space flight services from a foreign entity.⁷ NASA claims that their current incorporation and plan to continue to use commercial service providers help them execute their deep space exploration strategy within their anticipated budgets.⁸ NASA relies on commercial services it helped develop which it claims leads to economically efficient exploration, as well as defines their guiding principles for pioneering space, which includes leveraging U.S. industry/non-NASA capabilities whenever possible.⁹ They claim the ISS plays a key role as a destination and customer that enables NASA's strategy for using commercial crew and cargo services.¹⁰ NASA and Congress point out that as these commercial partners, "who are maturing their business models and

⁶ See NASA & CONGRESS, *supra* note 1, at 73- 90.

⁷ See NASA & CONGRESS, *supra* note 1, at 566, 744-50.

⁸ See NASA & CONGRESS, *supra* note 1, at 322.

⁹ See NASA & CONGRESS, *supra* note 1, at 296.

¹⁰ See NASA & CONGRESS, *supra* note 1, at 296.

technical approaches by providing critical services for the ISS, will be essential to enabling deep-space NASA missions.”¹¹ NASA and Congress go on to point to a number of successful partnerships with commercial service providers. “The NASA-sponsored Commercial Orbital Transportation Services (COTS) program resulted in development of new launch vehicles and cargo spacecraft” and “both Space Exploration Technologies (SpaceX) and Orbital ATK have successfully delivered cargo to the ISS using vehicles developed with NASA support.”¹² They indicate moving forward, commercial partners are expected to provide 6 flights per year to support the ISS and ultimately this will lead to increased commercial access to space.¹³ They then move on to discuss “the next phase of the commercial services program, Commercial Crew Transportation Capability (CCtCap), under which NASA awarded contracts for crew transportation services to Boeing and SpaceX.”¹⁴ Boeing will use their Crew Space Transportation (CST)-100 Starliner commercial spacecraft and SpaceX will use Launch Complex 39A, a former space shuttle launch pad, which NASA and Congress describe as innovative and has helped reshape the way NASA can provide launch services.¹⁵ Looking forward still, NASA and Congress have already set a date that in § 435 of the Act entitled “Mars 2033 Report”, mandates that not later than 120 days after its enactment, the Administrator shall contract with an independent, non governmental organization to study a Mars human space flight mission to be launched in 2033.¹⁶ Throughout *Mars: Our New Home?—National Plan to Conquer the Red Planet*, NASA and Congress have outlined succinctly their current scientific understanding, technological capabilities, continued partnership and reliance on commercial

¹¹ See NASA & CONGRESS, *supra* note 1, at 296.

¹² See NASA & CONGRESS, *supra* note 1, at 303.

¹³ See NASA & CONGRESS, *supra* note 1, at 304.

¹⁴ See NASA & CONGRESS, *supra* note 1, at 303.

¹⁵ See NASA & CONGRESS, *supra* note 1, at 317.

¹⁶ See NASA & CONGRESS, *supra* note 1, at 1146.

providers, and how that all aligns for them to succeed in their goals of securing life's distribution and future in the universe by seeing humans sustainably live on Mars.

Mars: Our New Home?—National Plan to Conquer the Red Planet accomplishes exactly what it sets out to do. In it, NASA and Congress address their recent passing of an Act that authorizes NASA, among other things, \$19.5 billion in funding and to partner with non-NASA commercial providers for deep space exploration and human travel to Mars by 2030. They present the reader with not only the legal authorization but also with its application to the technological side of accomplishing their plan. They familiarize the reader with Mars, review our current level of understanding and research, and walk through in detail our nation's plan in partnering with private commercial service providers for developing the technology and services to accomplish the ultimate goal of conquering the Red Planet. By organizing their plan in this way, it allows readers to gain an uninhibited disclosure of our nation's priorities in our journey to Mars. Although it does a good job of explaining our national strategy to get to Mars, it does not provide a thorough analysis or application of current international space law to the plan. It does not engage in a discussion of space law as a doctrine and what commitments we as the United States have, for example, as a signee of the Outer Space Treaty of 1967 to other nations. It does not attempt to comment on how, or even if at all, our plan fits within those international commitments. Is the National Aeronautics and Space Administration Transition Authorization Act of 2017 a unilateral declaration of a U.S. claim of sovereignty in space without any deference to international space law policy? Or does the Act fit squarely within our international obligations? Although *Mars: Our New Home?—National Plan to Conquer the Red Planet*, sets out what it aims to accomplish in outlining and explaining our national plan to get us to Mars, it leaves unaddressed any conversation or declaration on the broader international scale of the

aspirations it proclaims. Its title alone uses the words “National Plan to Conquer” in reference to Mars. What message is that sending to other space faring nations or signees of the Outer Space Treaty of 1967? Sending humans to Mars is no small feat and would represent quite possibly the biggest achievement in human history, leaving out any discussion about where Congress believes our endeavors fall within the larger context of the international community and essentially humanity as a whole, is certainly a shortcoming.

I thoroughly enjoyed reading *Mars: Our New Home?—National Plan to Conquer the Red Planet*. It presents an illuminating insight into one of the most intriguing areas of our nation’s future. It was both enjoyable and informative and I would recommend it to anyone interested in our nation’s space capabilities and anyone even remotely intrigued by the thought of the future of the human race as interplanetary settlers. It brings up topics that impact several areas of law from licensing and regulation to liability and indemnification. It also brings up questions of international space law and where these plans fit within its current framework. The other countries of the world, space faring or not, and the worldwide legal community should pay special attention to the information presented in these pages and take care to begin addressing potential legal issues they may present to them. Nonetheless, it was written in a way that the reader does not need an engineering or law degree to understand. The future *Mars: Our New Home?—National Plan to Conquer the Red Planet* envisions is extraordinary. It is astonishing to hear NASA and Congress so pragmatically present their plan to send humans to Mars within two decades and to see their authorizations, financial and otherwise, for accomplishing their goal. *Mars: Our New Home?—National Plan to Conquer the Red Planet* is an enlightening read that confirms sending humans to Mars is not only no longer science fiction, but that the U.S. is well on its way to sending Americans to “conquer” it.