GIBSON DUNN

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AEROSPACE AND RELATED TECHNOLOGIES UPDATE – SPRING 2021

To Our Clients and Friends:

This April 2021 edition of Gibson Dunn's Aerospace and Related Technologies Update discusses newsworthy developments, trends, and key decisions from 2020 and early 2021 that are of interest to companies in the aerospace, space, defense, satellite, and drone sectors as well as the financial, technological, and other institutions that support them.

This update addresses the following subjects: (1) commercial unmanned aircraft systems, or drones; (2) recent government contracts decisions involving companies in the aerospace and defense industry; and (3) the commercial space sector.

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I. Unmanned Aircraft Systems

A. New Rules Remote ID

On December 28, 2020, the FAA released final rules regarding the Remote Identification of Unmanned Aircraft ("Remote ID") and operations at night.[1] These rules, published in the Federal Register on January 15, 2021,[2] require that certain unmanned aircraft ("drones") broadcast their identification and location during operation. The final rules reflect the FAA's attempt to balance the competing interests in the federal airspace between commercial operators, hobbyists, law enforcement, and the general public.

The FAA received significant feedback on the Remote ID rules following its initial December 31, 2019 Notice of Proposed Rulemaking ("NPRM"), accumulating over 53,000 comments from manufacturers, organizations, state and local governments, and a significant number of individual recreational pilots.[3] In a departure from the original proposal, under the final rule, drones must broadcast the required Remote ID information "using radio frequency spectrum compatible with personal wireless devices" rather than over the internet to a third-party service provider.[4] The FAA received substantial feedback criticizing the original proposal as expensive and requiring additional hardware and a data plan from a wireless carrier, depending on internet connectivity.[5] But with drones now required to broadcast Remote ID information over ranges that can be received by cell phones, members of law enforcement and the general public will be able to receive the broadcasts and determine flight information about drones flying in their vicinity without special receiving technology.[6]

Compliance with Remote ID Rules

The rules create three ways in which operators and manufacturers can comply with the Remote ID rules: (1) a drone containing "Standard Remote ID," (2) a drone retrofitted with a "broadcast module," and (3) a drone without Remote ID operating recreationally in specified areas.[7] The rules include an exception for drones weighing less than 0.55 pounds (250 grams), which are not subject to the Remote ID rules if flown recreationally.[8]

Standard Remote ID

The primary form of compliance is "Standard Remote ID."[9] Standard Remote ID is built into a drone at the time of manufacturing and tested for compliance via FAA-approved methods. It requires the most robust broadcast, including the location of both the drone and its operator, along with certain flight parameters, a unique ID assigned to the drone and registered by the operator, and an emergency status indication. Additionally, Standard Remote ID drones must be configured to prevent takeoff if the Remote ID equipment is not functional.

Remote ID Broadcast Module

The second form of compliance involves the installation on a drone of a Remote ID "broadcast module."[10] This allows drones not manufactured with Standard Remote ID, including those currently in use, to comply with the Remote ID rules. The broadcast module's transmission is similar to Standard

Remote ID, except that it broadcasts the *takeoff* location rather than the location of the operator. Furthermore, drones outfitted with a broadcast module are not required to send an emergency status indication, and need not prevent the drone from taking off if the module is not functional. Unlike Standard Remote ID drones, those fitted with a Remote ID broadcast module are expressly limited to operation within visual line of sight.

Manufacturers should not rely on the Remote ID broadcast module moving forward. Starting eighteen months after the final rule becomes effective, manufacturers must meet the Remote ID standard in their production of drones. Restrictions on operation of noncompliant drones will take effect thirty months after the final rule becomes effective. As of now, the FAA has delayed implementation of the rule until April 21, 2021 as part of the Biden administration's regulatory freeze.[11]

FAA-Recognized Identification Areas

Lastly, the new rules create FAA-Recognized Identification Areas ("FRIAs") in which drones can be operated recreationally without complying with the Remote ID rules.[12] FRIAs are fixed locations where drones can be flown safely, thus preserving minimally regulated operations at hobbyist airfields, such as those maintained by the Academy of Model Aeronautics. In a departure from the proposed rules in the NPRM, which limited applicants to community-based organizations, the new rules expanded the list of potential FRIA applicants to include educational institutions.

Addressing Concerns Regarding Improper Use

The commercial drone industry has faced questions and concerns that drones will be operated in an unprofessional manner or used by malicious individuals to obtain data for nefarious purposes.[13] Law enforcement and government agencies have also shared concerns related to illegal operations, such as interference with manned aircraft.[14] The Remote ID rules will help address those concerns by allowing these organizations to identify the drone owner or determine if the drone is not equipped with Remote ID and not legally operating. Addressing these concerns will minimize some of the resistance the industry has faced. Further, Remote ID helps lay a foundation for an ecosystem in which tens of thousands of drones operate autonomously beyond visual line of sight on a daily basis. Although the current rules may be modified and more technology-developed, transmitting basic identification and location information will be a pillar of future large-scale autonomous operations. These rules are an important early step on the path to an integrated regime for regulating a rapidly growing body of unmanned aeronautical operations.

B. Flight Over People, Over Vehicles, or at Night

On December 28, 2020, the FAA released final rules impacting drone operations over people, over moving vehicles, or at night.[15] Prior to the new rules, Part 107 of the FAA regulations required commercial drone operators to receive a waiver in order to fly over people, over moving vehicles, or at night. In early 2019, the FAA and the Department of Transportation shared an NPRM, proposing alterations to Part 107 to make the operation of small unmanned aircraft over people or at night legal, under certain circumstances, without a waiver. On January 15, 2021, the final rule was published in the Federal Register.[16] The rule is scheduled to take effect on April 21, 2021.[17]

Drone Operations Over People

The new law permits commercial drone operations over people under certain conditions based on four categories of drones operating under Part 107. Category One, Two, and Four drones must be compliant with Remote ID rules discussed above to have sustained flight over open-air assemblies, but Category Three drones may never operate over open-air assemblies.

Category One is the most lenient category, consisting of drones that are both under 0.55 pounds (250 grams) and lack any exposed rotating parts that would cause lacerations.[18] Due to the weight restrictions, the drones in this Category will most likely initially be limited to photography and videography drones, but these restrictions may result in innovation of new lightweight sensors for expanded operations within Category One.

Categories Two and Three cover drones greater than 0.55 pounds and less than 55 pounds.[19] These categories allow drones to be flown over people only if the manufacturer has proven that a resulting injury to a person would be under a specified severity threshold. Category Two aircraft will need to demonstrate a certain injury threshold, and Category Three aircraft will have a higher injury threshold with additional operating limitations. Category Three drones can only operate over people (1) in a restricted access site in which all individuals on the ground have notice, or (2) without maintaining any sustained flight over people unless they are participating in the operations or protected by a structure.[20]

The new rules also created a fourth category that was not included under the proposed rules, but clarifies that specific drones for which the FAA has issued an airworthiness certificate under Part 21 can conduct operations over people unless prohibited under its operating limitations.[21]

Drone Operations Over Moving Vehicles

Although the proposed rule did not allow operations over moving vehicles, the final rule does allow such operations under two circumstances: (1) if in a restricted access site and the people in the vehicle are on notice, or (2) when the drone does not maintain sustained flight over moving vehicles.[22] This addition is a welcome change for all drone operators who no longer have to cancel, delay, or change an operation due to an unexpected vehicle or nearby traffic.

Drone Operations at Night

The rule also allows operations at night under two conditions: (1) the remote pilot in command must complete an updated initial knowledge test or online recurrent training, and (2) the drone must have proper anti-collision lighting that is visible for at least three statute miles.[23] Operators will be pleased with this change because it removes the need for nighttime waivers and delays associated with obtaining such waivers.

Looking Ahead

The Part 107 changes are steps in the right direction for increased commercial use of drones. Operating over people, moving vehicles, and at night expands the applications and timing of operations available to commercial operators. The additions to the proposed rules, such as permitting operations over moving vehicles, are an indication that the FAA is listening to the drone community and working to advance this industry.

C. Continued Lack of Clarity on Airspace

While new rules for Remote ID and operations over people, over moving vehicles, and at night are helpful to move the industry forward, they do not address the most challenging legal issue that remains for the commercial drone industry: control of low-altitude airspace. It remains unclear as to how much, if any, airspace is owned by private landowners and whether states and municipalities have any jurisdiction over low-altitude airspace. Furthermore, a legislative solution on this issue is increasingly improbable, and it will instead likely be decided by the courts years in the future.

In a nutshell, the confusion regarding low-altitude operations stems from the FAA's claim that it controls the airspace "from the ground up" and that the claim that it does not control all the airspace below 400 feet is a "myth."[24] However, many local governments and property owners do not agree with the FAA's interpretation. While the FAA has jurisdiction over "navigable airspace," many assert that the boundary of where that airspace ends and begins is far from clear.[25]

To date, this boundary has not been directly addressed by a court in the context of drones. The closest that federal courts have come to addressing this issue was in July 2016 when U.S. District Judge Jeffrey Meyer, of the District of Connecticut, questioned the FAA's position: "[T]he FAA believes it has regulatory sovereignty over every cubic inch of outdoor air in the United States . . . . [T]hat ambition may be difficult to reconcile with the terms of the FAA's statute that refer to 'navigable airspace.'"[26] The dicta raised the question of where the FAA's authority begins, but noted that the "case does not yet require an answer to that question."[27] In time a case will require such an answer.

The legal uncertainty surrounding low-altitude operations remains one of the most significant barriers to large-scale commercial operations, and it is likely to be one of the most important issues for the industry for years to come.

D. Newsworthy FAA Approvals

This past year saw several groundbreaking approvals of new uses for unmanned aircraft systems, specifically in operations beyond the visual line of sight and in the agricultural context. The industry also saw progress in setting airworthiness standards.

Beyond the Visual Line-of-Sight Approvals

Perhaps the most well-known approval occurred in August 2020, when, according to public filings, the FAA approved Amazon's use of a fleet of Prime Air delivery drones, allowing the company to expand

its unmanned package delivery operations.[28] The FAA issued this authorization under Part 135 of its Unmanned Aircraft Systems regulations, which govern the use of drones beyond the visual line of sight ("BVLOS") of the operator.[29] Although the Prime Air fleet is not yet fully scaled, this authorization enables the company to soon be able to deliver packages weighing five pounds or less in areas with relatively low population density.[30]

Further expanding the boundaries of BVLOS drone use, the FAA gave its first-ever approval of a company's use of automated drones without a human operator on site earlier this year.[31] In January 2021, the FAA authorized American Robotics, a Boston-based drone systems developer that specializes in operating in rugged environments, to begin such automated operations.[32] Obtaining this approval required a four-year testing program in which the company ran up to ten automated drone flights per day.[33] While only beginning to be fully understood, the automated use of drones without the need for on-site human personnel could have enormous ramifications for the agricultural, energy, and infrastructure industries.[34]

Agricultural Use Approvals

The agricultural industry may experience additional aerospace innovation after the FAA approved the Iowa-based startup Rantizo's use of drone swarms to spray crops.[35] The company received approval in July 2020 to operate three-drone swarms, which move in concert with one another with the help of one drone operator and one visual observer.[36] The approval will allow the company to cover between 40 and 60 acres of farmland per hour.[37]

Rantizo was not the only company to receive approval to operate drone swarms. In October 2020, the company DroneSeed obtained FAA approval to use five-drone swarms of heavy-lift drones beyond the visual line of sight for reforestation efforts in Arizona, California, Colorado, Montana, New Mexico, and Nevada.[38] Each of the company's drones can carry up to a 57-pound payload, and reports suggest that the company may focus its reforestation efforts on areas ravaged by wildfires.[39]

Creation of Airworthiness Standards

Lastly, in September 2020, the FAA opened for public comment its first-ever set of type-certification airworthiness standards relating to drones, with the goal of streamlining the certification of certain classes of drones.[40] Whereas the FAA has airworthiness standards in place for most types of manned aircraft, allowing companies seeking approval of such vehicles to avoid a cumbersome, case-by-case process, no such process previously existed for drones. The creation of a standard airworthiness certificate for drones as a class of aircraft could significantly shorten the drone approval process, potentially accelerating innovation in the aerospace industry.

E. COVID-19 and Use of Drones

As discussed in last year's update, many expected the global COVID-19 pandemic to usher in a new era of drone applications. In the early months of the pandemic, governments began using drones in novel ways: spraying disinfectant across large areas, developing disease detection mechanisms, and even enforcing social distancing requirements. Though these initial reports of drone usage in the age of

COVID-19 dealt mostly with disease control efforts, corporations soon shifted their focus to the socially distant environment, turning to drones to facilitate deliveries to consumers and medical providers alike and provide services in a safer way.

Consumer Deliveries

For years, corporations have been hoping to facilitate deliveries via drone, and the pandemic amplified consumer interest. With more and more people looking to avoid crowds and stay at home, demand for drone delivery of consumer goods increased, and many companies deployed their technology to facilitate deliveries via drone.

Wing (Alphabet's drone delivery company) launched a pilot program in October 2019, partnering with several local retailers to deliver certain products to people in Christiansburg, Virginia.[41] Since the pandemic, it has expanded its program by adding new products and new retailers, and deliveries have more than doubled.[42]

In North Dakota, Flytrex, an airborne delivery service company, launched a program allowing customers to order from a selection of 200 Walmart items.[43] The two companies recently introduced a partnership in North Dakota for grocery deliveries.[44] The company also delivers snacks to golfers at King's Walk course in North Dakota.[45]

In addition to consumer goods, food delivery via drone has also increased since the pandemic. In fact, Flytrex has begun testing drone delivery of food and drink items in North Carolina.[46] And in Alabama, the company Deuce Drone has partnered with some restaurants for drone doorstep delivery.[47]

As discussed above, in August 2020, Amazon received FAA approval under Part 135 of FAA regulations to "safely and efficiently deliver packages to customers."[48] This allows Amazon to transport property on small drones "beyond the visual line of sight."[49] Amazon, which began testing drones in 2013, is continuing to test the technology and has not yet deployed drones at scale.[50]

Medical Supplies Deliveries

Drones also delivered medical supplies in 2020. In May, Zipline, a company that has been using drones to deliver blood in Rwanda since 2016, began delivering medical supplies and personal protective equipment via drones to a medical center in North Carolina.[51]

In November 2020, Wal-Mart received approval to deliver COVID-19 test kits to El Paso, Texas residents.[52] A few months later, Nevada-based Flirtey announced: "that it has successfully conducted multiple deliveries of at-home COVID-19 test kits in Northern Nevada during the initial phase of its test program."[53] Drone delivery of COVID-19 test kits is more efficient and more convenient, and it reduces exposure risks.[54]

Remote Service Providers

Beyond deliveries, the pandemic also drove up demand for remote services as companies adapted to social distancing guidelines that made providing in-person services more difficult. Since the pandemic started, flights by construction-related companies are up 70%.[55] DroneDeploy, a startup that "has a program that analyzes drone footage of farmers' fields and helps make recommendations about when to apply pesticides" has reported that these agriculture flights have tripled during the first several months of the pandemic.[56] The company also reported significant increases in flights using its energy app, which helps solar panel installers calculate where best to place the panels.[57]

Lasting Impact?

Though there has certainly been an expansion of drone services in the U.S., this expansion is not widespread. Many of the examples discussed above are limited to small geographic areas and it is still unclear when mass adoption will occur. While the pandemic appears to have pushed forward the adoption of drone delivery and service programs, it is unclear if that mentality will change after societies are no longer quarantined at home. Will there be as much of a demand for drone deliveries and services once there is no longer a pandemic-driven crisis?

Despite these uncertainties, many are optimistic about the future of drone deliveries. Technologies are improving, and most of the elements needed for the widespread adoption of drones are already available in the market.[58]

II. Government Contracts

In this update, we summarize select recent government contracts decisions that involve companies in the aerospace and defense industry, as well as decisions that may be of interest to them, from the tribunals that hear government contracts disputes. These cases address a wide range of issues with which government contractors in the aerospace and defense industry should be familiar.

DFARS 252.227-7103(f) Does Not Prohibit Markings On Noncommercial Technical Data That Restrict Third-Party Rights

In *The Boeing Co. v. Sec'y of the Air Force*, 983 F.3d 1321 (Fed. Cir. 2020), the Federal Circuit considered whether Defense Federal Acquisition Regulation Supplement 252.227-7103(f) ("DFARS 252.227-7103(f)") applies to legends that restrict only the rights of third parties but do not restrict the rights of the Government. Boeing applied a legend to its technical data that stated, "NON-U.S. GOVERNMENT ENTITIES MAY USE AND DISCLOSE ONLY AS PERMITTED IN WRITING BY BOEING OR THE U.S. GOVERNMENT." The Government rejected Boeing's data deliverables because the legend allegedly did not conform to DFARS 252.227-7103(f), which stated that the contractor could "only assert restrictions on the Government's rights," and specified the legends authorized under the contract. The Armed Services Board of Contract Appeals' ("ASBCA") decisions below found in favor of the Government. On appeal, Boeing argued that its legend conformed to the requirements of DFARS 252.227-7103(f) because the clause is applicable only to legends that assert restrictions on the Government's rights, and is silent on legends that assert restrictions on the rights of

third parties. The Federal Circuit agreed with Boeing that DFARS 252.227-7103(f) applies only to legends that assert restrictions to the Government's rights in the data, and is silent on legends that restrict the rights of third parties. The Federal Circuit remanded the decision to the ASBCA to decide whether, as a matter of fact, Boeing's legend asserted rights that restricted the Government's rights in the data on which the legend was included.

ASBCA Declines To Decide Whether Fly America Act Applies To Indirect Costs

In *Lockheed Martin Corp.*, ASBCA No. 62377 (Jan. 7, 2021), the ASBCA did not reach the question of whether the Fly America Act, 49 U.S.C.A. § 40118, as implemented by Federal Acquisition Regulation 52.247-63, Preference for U.S.-Flag Air Carriers, applies to a contractor's indirect costs because there was no "live dispute" between the parties. FAR 52.247-63, "requires that all . . .Government contractors and subcontractors use U.S.-flag air carriers for U.S. Government-financed international air transportation of personnel (and their personal effects) or property, to the extent that service by those carriers is available." It further requires that "[i]f available, the Contractor, in performing work under this contract, shall use U.S.-flag carriers for international air transportation of personnel (and their personal effects) or property."

In 1997, Lockheed Martin Corporation and the Government entered into a memorandum of understanding ("MOU") that the Fly America Act applied only to direct costs. However, in 2019, the corporate administrative contracting officer ("CACO") withdrew the MOU on the purported basis that the MOU had misinterpreted FAR 52.247-63, and issued a final decision asserting the interpretation that FAR 52.247-63 applies to indirect costs. The ASBCA did not address the merits of the issue, finding that because Lockheed had not changed its practices as a result of the Government's withdrawal of the MOU or the CACO's final decision, there was no evidence that there was a live dispute to decide.

ASBCA Clarifies Types Of Activities That Are Not Unallowable Costs Under The FAR

In *Raytheon Co. & Raytheon Missile Sys.*, ASBCA Nos. 59435 *et al.*, (Feb. 1, 2021), the ASBCA issued a lengthy decision on the allowability of various types of costs incurred by Raytheon Company and its business segment Raytheon Missile Systems ("Raytheon"). The ASBCA sustained all but $18,109 of Raytheon's appeals of the Government's $11.8 million claims. The types of costs addressed in the decision include costs for Raytheon's Government relations group, costs for Raytheon's corporate development group, and airfare costs.

Government Relations Costs. In 2007 and 2008, Raytheon included Government relations group costs as indirect costs in its incurred cost submissions, but withdrew a portion of those costs as unallowable lobbying costs in accordance with FAR 31.205-22, Lobbying and political activity costs, which requires that contractors "maintain adequate records to demonstrate that the certification of costs as being allowable or unallowable…pursuant to this subsection complies with the requirements of this subsection." The Government disagreed with Raytheon's practice and disallowed 100 percent of the costs incurred by Raytheon's Government relations group as expressly unallowable costs.

The ASBCA held that the Government had the burden to prove that the costs were expressly unallowable and that there was no basis to shift the burden to the contractor. The ASBCA further held that the

Government did not meet its burden of proving that any of the Government relations costs included in Raytheon's incurred costs submissions were unallowable, and that Raytheon's method of removing unallowable lobbying costs was proper based on its disclosed accounting practice.

Corporate Development Costs. Raytheon included a portion of corporate development group costs as indirect costs in its incurred cost submission in 2007 and 2008, but withdrew a portion of the costs as unallowable organizational costs under FAR 32.205-27, Organization Costs. Raytheon implemented a "bright line" rule for its employees to determine the difference between costs for allowable activities under FAR 31.205-12, Economic Planning Costs, and FAR 31.205-38, Selling costs, and costs for unallowable activities under FAR 31.205-27. The Board found Raytheon's corporate development employees kept track of their time in accordance with the bright line rule, that the allowable costs for the corporate development group were supported by documentation and credible witness testimony, and that the Defense Contract Management Agency ("DCMA") did not meet its burden of proving that the corporate development costs were unallowable organization costs under FAR 31.205-27.

Airfare Costs. With respect to airfare costs, the ASBCA addressed two distinct issues: (1) whether the pre-Jan. 11, 2010 version of FAR 31.205-46(b) required Raytheon to take into account its corporate discounts in determining its allowable airfare; and (2) whether Raytheon's policy of allowing business class travel for trans-oceanic flights in excess of 10 hours was reasonable and consistent with FAR 31.205-46(b). Prior to Jan. 11, 2010, FAR 31.205-46(b) stated:

Airfare costs in excess of the *lowest customary standard, coach, or equivalent airfare* offered during normal business hours are unallowable except when such accommodations require circuitous routing, require travel during unreasonable hours, excessively prolong travel, result in increased cost that would offset transportation savings, are not reasonably adequate for the physical or medical needs of the traveler, or are not reasonably available to meet mission requirements. However, in order for airfare costs in excess of the above standard airfare to be allowable, the applicable condition(s) set forth in this paragraph must be documented and justified.

(Emphasis added.) Effective Jan. 11, 2010, FAR 31.205-46(b) was amended to read: "Airfare costs in excess of the ***lowest priced airfare available to the contractor*** during normal business hours are unallowable except …" (emphasis added).

The ASBCA concluded that prior to Jan. 11, 2010, contractors were not required to factor in any negotiated corporate discounts when determining the allowable amounts of airfare costs. The ASBCA also held that Raytheon's travel policy "documented and justified premium airfare," as required by FAR 31.205-46(b), and that there is no requirement that premium airfare be "documented and justified" on an individual, flight-by-flight basis. Moreover, the ASBCA held that the CO acted within the scope of his authority when he determined that Raytheon's travel policy complied with FAR 31.205-46(b), and that his determination was binding on DCMA.

ASBCA Rules That Government Shares Liability for Contractor's Underfunded Pension Plan

In *Appeal of Northrop Grumman Corp.*, ASBCA No. 61775 (Oct. 7, 2020), the ASBCA found that Northrop Grumman ("NG")'s valuation of a nonqualified defined benefits pension plan adopted in 2003

and frozen in 2014 was compliant with the Cost Accounting Standards despite the Government's objections to the company's valuation methodology. During the plan's existence, NG allocated its costs to numerous government contracts, all of which included FAR 52.215-15, Pension Adjustments and Asset Reversions; FAR 52.230-2, Cost Accounting Standards; and FAR 52.233-1, Disputes.

When the plan was frozen, NG calculated that the plan's liabilities exceeded its market value and requested that the Government pay its pro rata share to NG to "true-up" the plan under CAS 413. The Government argued, *inter alia*, that NG's reduction to its calculation of investment income to account for taxes on such income was non-compliant with CAS 412. Although the Board disagreed with NG's approach of reducing its investment rate of return by the marginal tax rate, the Board found that roughly the same outcome would have been achieved had NG accounted for taxes as an administrative expense. Because FAR 30.602(c)(1) provides that the Government should make no adjustment to the contract when there is no material cost difference due to the alleged CAS violation, the Board sustained NG's appeal and remanded to the parties to calculate the amount due and owing from the Government to NG.

Contractor's REAs Were Not Contract Disputes Act ("CDA") Claims Subject to the CDA Statute of Limitations

In *Appeal of BAE Sys. Ordnance Sys., Inc.*, ASBCA No. 62416 (Feb. 10, 2021), the Board considered whether BAE's requests for equitable adjustment ("REAs") constituted claims in light of the Federal Circuit's recent decision in *Hejran Hejrat Co. Ltd v. United States Army Corps of Engineers*, 930 F.3d 1354 (Fed. Cir. 2019). In *Hejran Hejrat*, the Federal Circuit ruled that, under certain circumstances, an REA can actually constitute an implicit request for a final decision.

BAE submitted three REAs seeking reimbursement for state-issued fines it received as a result of environmental conditions at the plant. The contracting officer ("CO") replied that he would "entertain reimbursement" of a portion of the state fines, but later issued a "final determination" rejecting the REAs entirely. Subsequently, BAE submitted a CDA claim to which the Government failed to respond. BAE appealed the deemed denial of its claim to the Board. The Army then moved to dismiss the appeal asserting that BAE's challenge to the CO's decision was untimely because the REAs were, in fact, CDA claims, and the CO's final determination upon them was thus a CO's Final Decision. In denying the government's motion to dismiss the appeal for lack of jurisdiction as outside of the CDA's statute of limitations, the Board found that "BAE did all that it could to keep its REAs from falling within the realm of being also considered CDA claims by carefully avoiding making a request — explicit or implicit — for a [contracting officer]'s final decision." Therefore, the Board found that BAE's claims were timely filed and denied the government's motion to dismiss.

III. Space

A. First Private Human Space Launch

On November 15, 2020, the launch of SpaceX's *Resilience* marked the first "NASA-certified commercial human spacecraft system."[59] The mission is the first of six crewed missions NASA and SpaceX plan to fly as part of the Commercial Crew Program, a program designed to provide "safe, reliable, and cost-effective transportation to and from the International Space System from the United

States."[60] The crew is comprised of four members, including three NASA astronauts and one member of the Japan Aerospace Exploration Agency.[61]

Resilience autonomously docked at the International Space Station on November 16, 2020 for a six-month stay, making it the longest space mission launched from the United States. During the mission, the crew is conducting various science and research investigations, including a "study using chips with tissue that mimics the structure and function of human organs to understand the role of microgravity on human health and diseases."[62] The crew will also conduct various space walks, encounter several uncrewed spacecraft, and welcome crews from the Russian Soyuz vehicle and the next SpaceX Crew Dragon.[63] At the end of the mission, *Resilience* will autonomously undock and return to Earth.

B. Noteworthy Space Achievements in Countries Other than the United States

Countries and private companies are racing to the Moon, Mars, and even asteroids. This space race involves countries that are both newcomers to space and those that seek a return to the unknown.

China

Chang'e-5's Lunar Exploration Mission

Following the Chang'e-4's successful lunar exploration mission in 2019,[64] China reached the Moon again in 2020. On November 23, 2020, Chang'e-5 lifted off from Wenchang Space Launch Center on Hainan Island, China and went into the Moon's orbit on November 28, 2020.[65] The descender craft separated from the orbiter on November 29, 2020 and landed on the Mons Rümker region of Oceanus Procellarum on December 1, 2020.[66] Once on the Moon's surface, the lander system used a scoop and drill to dig up lunar samples.[67] After collection and storage, Chang'e-5 made its return to Earth on December 16, 2020, landing in the Siziwang Banner grassland of the autonomous region of Inner Mongolia in northern China.[68] The successful mission retrieved about 1,731 g (61.1 oz.) of lunar samples.[69] Chang'e-5 was China's first successful lunar sample return mission,[70] and the first in the world in over four decades since the Soviet Union's Luna-24 in 1976.[71]

The Chang'e-5 venture demonstrates China's increasing capability in space, and is part of a broader effort under the Chinese National Space Administration Chang'e Lunar Exploration Program.[72] The Chang'e-6, expected to launch in 2023, will be China's next lunar sample-return mission.[73]

Tianwen-1 Reaches Mars's Orbit

China's first independent interplanetary mission is well underway with the launch of the Tianwen-1 spacecraft on July 23, 2020.[74] After a 202-day, 295-million-mile journey through space, it arrived in orbit around Mars on February 10, 2021.[75] The first phase of Tianwen-1's mission is to circle Mars's orbit and map the planet's morphology and geology, while allowing the orbiter to find a secure landing zone.[76]

About three months after arrival into orbit, in May 2021, the craft's lander is expected to detach from its orbiter and descend onto Mars's surface in a region known as Utopia Planitia.[77] Once on the surface,

the lander will unveil a rover carrying a panoramic camera.[78] The solar-powered rover will also investigate surface soil characteristics for potential water-ice distribution with a ground-penetrating radar.[79] Tianwen-1 comes on the heels of several successful lunar missions for China's space program.[80]

China's Ambitious Plans for a Space Station

China has ambitious plans for a new space station.[81] Tianhe, the station's core module, is expected to launch sometime in 2021.[82] The module is 59 feet (18 meters) long, weighs about 24 tons (22 metric tons), and will provide living space and life support for astronauts and house the outpost's power and propulsion elements.[83] Tianhe's launch will be one of eleven total liftoffs that will be required to build the space station, which China wants to finish by the end of 2022.[84]

China's iSpace Fails to Reach Orbit During Second Attempt

China's iSpace, also known as Beijing Interstellar Glory Space Technology Ltd. (a different company than the Japanese lunar startup ispace) was the first Chinese private company to reach orbit when it successfully launched its Hyperbola-1 rocket on July 25, 2019.[85] On February 1, 2021, iSpace's four-stage Hyperbola-1 rocket failed to reach orbit during its second attempt to go to space.[86]

Despite its failed launch, iSpace is a prominent name in the Chinese private space industry, having raised $173 million in Series B funding for the Hyperbola rocket line. The company has indicated plans for a potential IPO and is in the midst of creating its Hyberbola-2 rocket.[87] Other private Chinese companies, including Galactic Energy, One Space, and Deep Blue Aerospace, are planning launches later this year.[88]

Japan

Hayabusa2's Samples From Asteroid Ryugu

After spending over a year collecting and storing samples on a near-Earth asteroid named Ryugu,[89] Japan's Hayabusa2 spacecraft started its journey back towards Earth in November 2019.[90] It completed its yearlong journey to return the asteroid samples back to Earth on December 5, 2020.[91] The return capsule landed in South Australia, carrying with it samples from the asteroid's surface and interior.[92] From the samples, scientists hope to learn more about the composition of Ryugu's minerals, as well as the origin and evolution of the solar system.[93]

Hayabusa2 was originally launched in 2014,[94] and its mission is far from over.[95] The Hayabusa2's main craft separated from the return capsule just two days before the delivery of Ryugu's samples was complete and retreated back to work on an extended mission.[96] Hayabusa2's extended mission will feature visits to two more asteroids, one in 2026 and another in 2031.[97]

Japanese Startup Is Targeting the Moon in 2021

A Japanese startup, ispace (a different company than China's iSpace), is targeting the Moon.[98] On August 22, 2020, company representatives stated ispace intends to go to the lunar surface on a stationary lander in 2021.[99] The company is also planning a second mission in 2023, in which it will deploy a rover for surface exploration.[100] These two missions will ride as secondary payloads on SpaceX Falcon 9 rockets, and together make up ispace's Hakuto-Reboot program.[101]

United Arab Emirates

Hope Arrives on Mars

On February 9, 2021, the UAE's Hope orbiter entered into Mars's orbit,[102] making the UAE the fifth country to visit the Red Planet (China became the sixth the next day with its Tianwen-1 mission),[103] and the first Arab nation in history to do so.[104] Hope will take up a near-equatorial orbit as it observes the planet's atmosphere, weather, and climate systems.[105] Hope also aims to study the leakage of hydrogen and oxygen into space, which scientists suspect is a contributing factor to Mars missing the once-abundant water that previously occupied its surface.[106]

Russia

Expected Launch of Luna-25 in October 2021

After a nearly half-century hiatus for its space program,[107] Russia is gearing up for a launch to the Moon.[108] Russia's Luna-25 spacecraft will be the first Russian or Soviet Moon mission since 1976,[109] and will mark the reactivation of Russia's Moon exploration program.[110] The Luna-25 lander will include scientific instruments to research the composition and structure around the Moon's south pole.[111] Luna-25 is expected to launch in October 2021.[112]

Looking Ahead

As more countries join the space race, the global community benefits from all of research, technology, and discoveries resulting from outer space exploration. With upcoming missions to the Moon, Mars, and the development of a space station, the upcoming year is sure to result in tremendous advancement in our understanding of space.

C. Other Noteworthy Space Developments

The last year featured a number of developments in space technology, including from SpaceX, which became the first private company to launch astronauts to space, made progress on its Starship design, and launched a public beta program of its Starlink satellite internet service.

Crewed Flights

On May 30, 2020, SpaceX became the first private company to launch astronauts into orbit.[113] The mission marked the first launch of NASA astronauts from the U.S. since the space shuttles were retired in 2011.[114] The Falcon 9 Rocket carried a Crew Dragon capsule, an upgraded version of SpaceX's Dragon capsule, which has been used to carry cargo to the space station.[115] While on board, the astronauts, tested all of the systems and verified that they performed as designed.[116] The astronauts arrived at the International Space Station on May 31, 2020,[117] and returned safely to Earth on August 2, 2020.[118]

Just five and a half months later, SpaceX sent astronauts to space again. As discussed above, on November 15, 2020, NASA's SpaceX Crew-1 mission lifted off—the first of six crewed missions NASA and SpaceX plan to fly as part of the Commercial Crew Program, a program designed to provide safe, reliable, and cost-effective transportation between the ISS and the U.S.[119] The mission marked many firsts, including "the first flight of the NASA-certified commercial system designed for crew transportation."[120] In contrast to the May launch, the Crew-1 mission transported four astronauts (three NASA astronauts and one from the Japan Aerospace Exploration Agency) to the International Space Station for a six-month science mission.[121] The crew arrived safely on November 16, and will eventually reboard Crew Dragon for transport back to Earth.[122]

Starship SN Flights

Following the successful launch of its first astronaut mission in May, SpaceX shifted gears to focus on the Starship, the rocket designed to launch cargo and up to 100 passengers at a time on missions to the Moon and Mars.[123] CEO Elon Musk acknowledged that the rocket has many milestones to reach before people can fly in it.[124]

After multiple launches of several starship prototypes failed, on August 4, 2020, SpaceX flew the Starship SN5 test vehicle for the first time ever.[125] Though the SN5 was only in the air for about 40 seconds, the short hop allowed SpaceX to gather valuable data necessary to analyze and smooth out the launch process.[126]

Just several weeks later, SpaceX launched SN6, which rose to nearly 500 feet above the ground before touching down near the launchpad.[127] Similar to the SN5 launch, the launch of the SN6 prototype was used to help SpaceX understand the technologies needed for a fully reusable launch system for deep space missions.[128]

On December 9, 2020, SpaceX launched Starship SN8 to 40,000 feet above its facility in Boca Chica, Texas.[129] After completing several objectives, including testing its aerodynamics and flipping to prepare for landing, the rocket exploded on impact as it attempted to land.[130] SpaceX declared the launch a success; despite the fiery landing, the nearly seven-minute flight provided helpful information to improve the probability of success in the future.[131]

Other Updates

SpaceX launched many satellites into orbit in 2020. Throughout the year, SpaceX launched satellites for the U.S. Space Force[132] and foreign militaries.[133] SpaceX also began to launch satellites for its Starlink mega-constellation, an infrastructure project designed to provide global broadband coverage to people in rural and remote areas.[134] As of January 29, 2021, SpaceX had deployed 1,023 satellites over the course of 18 launches.[135] In October, SpaceX began a public beta program of the Starlink satellite internet service in the northern U.S., Canada, and the U.K.[136] By February 2021, the Starlink satellite internet service had over 10,000 users.[137]

SpaceX had a monumental fundraising year. In May, SpaceX raised more than $346 million.[138] In August, the company reported its largest single fundraising round to date: $1.9 billion in new funding.[139] SpaceX also sold an additional $165 million in common stock.[140] In December, SpaceX began discussing another funding round with investors. This round will likely value the company at a minimum of $60 billion and possibly as high as $92 billion.[141]

D. NASA's Perseverance Rover, Past Updates, and Future Plans

Two of NASA's biggest accomplishments this year were the successful landing of the Perseverance Rover on Mars and the publication of the Artemis Plan, a document that outlines NASA's intention to return a human to the Moon.

Perseverance Rover

On February 18, 2021, NASA's Perseverance Rover landed safely in an area known as Jezero Crater on Mars.[142] Perseverance's mission is to search for signs of ancient life and collect samples of rock and regolith for a return to Earth.[143] The Perseverance Rover will examine Martian dirt and rock with a variety of sophisticated scientific gear, including an instrument called SuperCam, which will zap rocks with a laser and gauge the composition of the resulting vapor.[144] The Rover will also utilize its drill and long robotic arm to collect samples and seal them into special tubes, and these samples will be brought back to Earth, perhaps as early as 2031.[145] Once returned, these samples will be analyzed and studied by scientists for decades to come.[146]

Artemis Plan

The United States is pushing forward on its plans to return to the Moon, with NASA publishing its comprehensive Artemis Plan in September 2020.[147] Under the Artemis Plan, the United States plans to send the next man and first woman to the Moon by 2024, and establish a sustained human presence on the Moon by 2028.[148] However, Congress is only providing $850 million for work on the Human Landing System to support NASA's Artemis mission, well short of the requested $3.37 billion on the project.[149] This shortfall is the biggest risk to the ambitious goals and timing of the Artemis Plan.[150]

The Artemis I Mission

Artemis I is set to be the first mission under the Artemis Plan, and it is currently scheduled for launch on November 2021.[151] It will be an uncrewed mission from NASA's Kennedy Space Station in Florida.[152] This mission will allow NASA to test its powerful new Space Launch System and Orion spacecraft.[153]

Commercial Lunar Payload Services

Under the Artemis Plan, NASA established the Commercial Lunar Payload Services initiative ("CLPS") to partner with the U.S. commercial space industry to introduce new lander technologies and deliver payloads to the surface of the Moon.[154] As of February 2021, NASA had 14 companies on contract through CLPS to bid on delivery science experiments and technology demonstrations to the lunar surface.[155] Most recently, NASA awarded Firefly Aerospace of Cedar, Texas approximately $93.3 million to deliver a suite of ten science investigations and technology demonstrations to the Moon in 2023.[156]

Lunar Orbital Platform Gateway

The Lunar Orbital Platform Gateway is instrumental to NASA's goal of sustaining a human presence on the Moon.[157] The Gateway will be a station orbiting the Moon that will serve as a holding area for astronaut expeditions and science investigations, as well as a port for deep space transportations.[158] NASA has selected SpaceX to provide launch services for the first two Gateway modules, the Power and Propulsion Element ("PPE") and Habitation and Logistics Outpost ("HALO"), which are targeted to launch together no earlier than May 2024.[159]

Human Landing System

NASA's Human Landing System Program ("HLS") is tasked with developing a lander that will haul two astronauts to the Moon in 2024, and then safely return them to lunar orbit before their trip back to Earth.[160] Three companies have been selected to begin development work for the HLS: Blue Origin (of Kent, Washington), Dynetics, a Leidos company (of Huntsville, Alabama), and SpaceX (of Hawthorne, CA).[161] HLS is also charged with developing a sustainable, long-term presence on and around the Moon.[162]

E. Record-Setting Private investment

Over the past several years, there has been increased interest in investing in pure aerospace companies, and more recently, space and space-satellite-based companies have become the focus of special-purpose acquisition companies ("SPACs").[163] Numerous milestones are driving the rise of space stocks traded on exchanges. For example, companies such as Virgin Galactic have been developing, and are on the cusp of starting, a commercial space tourism service; AstraSpace is entering the public market through a blank-check merger with Holicity; and Momentus is going public via Stable Road Capital, among others.[164] In addition to the above, exchange traded funds ("ETF") have been rising in popularity as well.

To further illustrate the above, one only has to look to ETFs such as Procure Space ETF, a space-related fund launched in 2019, which has holdings in various space stocks.[165] In January, Cathie Wood's Ark Investment Management announced in a filing that it was looking to start the ARK Space Exploration ETF.[166] This ETF would focus on exposure to "companies involved in space-related businesses like reusable rockets, satellites, drones, and other orbital and sub-orbital aircrafts."[167]

In terms of SPACs, the aerospace industry has shown a significant amount of growth. SPACs are among the trendiest, high-growth investment opportunities in the finance world at the moment.[168]A SPAC raises money through an IPO to acquire an existing operating company. In the past, we have seen successful SPACs such as when Virgin Galactic merged with Social Capital Hedosophia, or when Momentus Space merged with Stable Road Acquisition Corp.[169] Another company considering a merger with a SPAC is Kraus Hamdani Aerospace, whose aircraft can "safely carry satellite payloads within the stratosphere, providing a lower cost alternative to satellites with zero carbon footprint[.]"[170] It appears that SPACs can provide a beneficial pathway for aerospace companies to obtain important access to capital.

There are other companies to watch for as well in the near term. Firefly Aerospace is a "small launch vehicle developer" that is increasingly nearing its first orbital launch attempt, and it is looking to raise $350 million to "scale up production and work on a new, larger vehicle."[171] This is after Relativity Space, a similar launch vehicle developer, raised $500 million in November of 2020.[172]

In viewing the industry, it seems clear that the rise in space and space-related development is leading to more and more opportunities for small to large companies to expand into the public markets in order to raise the capital necessary to further expand these companies' operations. Moreover, with the similar rise in ETFs and SPACs, access to equity in space companies, which may have been limited to a select few in years prior, is now more available to the general public than ever before. As such, the space industry market should be one to follow and watch for in the coming years.

F. Satellite Internet Constellations

The space industry, which includes the consumer broadband sector, saw record private investment in 2020.[173] One area of investment was in the continued development of satellite constellations that provide internet access across the globe. These new technologies offer great business potential and provide internet access to underserved remote populations. In fact, federal agencies are encouraging more private investment in the space economy, including internet satellite constellations.[174]

In December 2020, the FCC awarded $9.2 billion in funding to bidders as part of the Phase I Auction from its Rural Digital Opportunity Fund ("Fund"). The Fund, established in 2019 with $20 billion in funding, is to be used for providing internet access to the millions of Americans without internet access, particularly in rural and remote areas.[175] The funding is estimated to provide high-speed broadband internet service to 5.22 million users[176]— Former FCC Chairman Ajit Pai described it as the "single largest step ever taken to bridge the digital divide."[177] According to Pai, the awards would bring "welcome news to millions of unconnected rural Americans who for too long have been on the wrong

side of the digital divide. They now stand to gain access to high-speed, high-quality broadband service."[178]

On January 19, 2021, over 150 members of Congress wrote a letter urging the FCC "to thoroughly vet the winning bidders to ensure that they are capable" and to "consider opportunities for public input on the applications."[179] Among other requirements, winning bidders must deliver financial statements, coverage maps, and certify to the FCC that their network is able to deliver "to at least 95% of the required number of locations in each relevant state."[180]

Multiple companies developing satellite constellations that provide internet access from low earth orbit are creating many opportunities, but these projects have also led to some concern. The U.S. National Oceanic and Atmospheric Administration projected that the number of active satellites in orbit could increase by 50% or more in 2021.[181] The injection of more satellites into low earth orbit increases the risk of collisions between man-made objects, which could create orbital debris that itself might collide with other space objects, thus resulting in greater accumulations of "space junk."[182] According to Morgan Stanley, some government agencies now struggle to track this orbital debris, creating potential demand for private companies to track and maintain this potentially catastrophic threat.[183]

The rapidly developing breakthroughs in satellite broadband internet access will bridge the gap in the digital divide, and be the driving force in a projected trillion-dollar industry. Morgan Stanley projects that the global space economy could generate more than $1 trillion in revenue by 2040, with satellite broadband accounting for 50-70% of the projected growth.[184]

G. Expected Impact of Biden Administration

The inauguration of President Biden on January 20, 2020 signaled the beginning of significant changes to policies of the Trump administration in many key areas, but thus far President Trump's space-related policies have generally proven a uniquely bipartisan area of continuity during this latest transition of power.

Having inherited a global pandemic, among other issues, President Biden's first priorities have primarily been more terrestrial in focus, and insight into future policy decisions generally have to be gleaned from statements made on the campaign trail. However, the administration's early remarks regarding Trump-era ventures like the Space Force and NASA's Project Artemis have given those with their eyes turned skyward reasons for optimism, which has only been bolstered by President Biden's symbolic decoration of the Oval Office with a moon rock collected during the Apollo 17 mission of 1972.[185]

Space Force

On December 20, 2019, President Trump signed the National Defense Authorization Act for Fiscal Year 2020 ("NDAA") establishing the United States Space Force as the sixth branch of the United States military, and the first new military service in more than 70 years.[186] Its duties are to "(1) protect the interests of the United States in space; (2) deter aggression in, from, and to space; and (3) conduct space operations."[187] Since its establishment, about 2,400 service members have officially transferred into

the Space Force service, with plans to grow to 6,400 active-duty troops and add a reserve component in 2021.[188]

Despite earlier speculation to the contrary, White House spokeswoman Jen Psaki recently affirmed that the Space Force "absolutely has full support of the Biden administration."[189] In response, the Chief of Space Operations Gen. John Raymond emphasized that the White House's unambiguous statement of support for the Space Force makes it "really clear that this is not a political issue, it's an issue of national security."[190] That same sentiment is also reflected in Congress among bipartisan lawmakers who view the new branch as integral to ensuring the military puts enough focus on space to counter China and Russia.[191] Although President Biden has not yet publicly detailed his plans for the future of the Space Force, it does appear to be here to stay.

Space Exploration

In early February 2021, the White House also announced support for Project Artemis, NASA's effort to return astronauts to the lunar surface. President Biden's endorsement of the Artemis program means it will become the first major deep space human exploration effort with funding to survive a change in presidents since Apollo, after several fitful efforts to send astronauts back to the moon and beyond ultimately went nowhere.[192]

The Trump administration embraced exploration and directed NASA to speed up its moon campaign, directing it to land another man, and the first woman, on the lunar surface by 2024, but the time frame of this goal appears to be stifled by budgetary constraints, safety concerns, and other matters of national priority like COVID-19 relief.[193] For example, NASA requested a total of $25.2 billion for FY2021, a 12 percent increase over FY2020, in order to pay for Artemis. Although Congress had been steadily adding money to NASA's budget for several prior years, in this case it provided less, $23.3 billion, suggesting there are limits to what it will allocate.[194]

Additionally, speculation remains that the Biden administration may instead prioritize NASA missions focused on increasing earth-observation capabilities, rather than space exploration. Lori Garver, the NASA deputy administrator during the Obama administration, was a key speaker at the SpaceVision 2020 convention on November 7 and 8, 2020. She noted, "[m]anaging the Earth's ability to sustain human life and biodiversity will likely, in my view, dominate a civil space agenda for a Biden-Harris administration."[195] However, eleven Democratic senators have already sent a letter to President Biden urging greater funding for Project Artemis, stressing that other NASA programs should not be cannibalized to pay for it.[196] As such, the first explicit insight into President Biden's support for human spaceflight, and the timeline at which it can proceed, will likely be the FY2022 budget request that the President will send to Congress in the coming months.

Nevertheless, space exploration remains an overwhelmingly popular and bipartisan goal among Americans. Polls taken last year showed, for example, that 80% of Americans believed space travel supports scientific discovery; 78% had a favorable impression of NASA; 73% said NASA contributes to pride and patriotism; and 71% said NASA is not just a desirable agency, but a necessary one.[197] Such uniquely bipartisan support in this area cannot go unnoticed by the

administration. Indeed, it appears that even if delayed for now, the question of landing another man or woman on the moon—or beyond—is a matter of when, not if, for the Biden Administration.

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