

2013

## Commercializing Space: Intellectual Property Concerns with Space Act Agreements

Bryan Parrish

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### Recommended Citation

Bryan Parrish, *Commercializing Space: Intellectual Property Concerns with Space Act Agreements*, 78 J. AIR L. & COM. 651 (2013)  
<https://scholar.smu.edu/jalc/vol78/iss3/6>

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**COMMERCIALIZING SPACE: INTELLECTUAL PROPERTY  
CONCERNS WITH SPACE ACT AGREEMENTS**

BRYAN PARRISH\*

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## INTRODUCTION

On May 25, 2012, Space Exploration Technologies (SpaceX) became the first commercial company to dock with the International Space Station.<sup>1</sup> This achievement marked a milestone in the company's \$278 million Commercial Orbital Transportation Services contract with the National Aeronautic and Space Administration (NASA).<sup>2</sup> Five months later, SpaceX again docked with the International Space Station, this time completing the first of twelve resupply missions contracted for under a separate \$1.6 billion Commercial Resupply Services agreement.<sup>3</sup>

SpaceX is not without competitors in the race for lucrative NASA contracts. Sierra Nevada Corporation, Blue Origin LLC, Boeing Company, and Orbital Sciences Corporation have all recently received NASA contracts.<sup>4</sup> In a market characterized by high barriers to entry and limited resources, receiving NASA

<sup>1</sup> Trent J. Perrotto & Josh Byerly, *SpaceX Dragon Attached to Space Station in Spaceflight First*, NASA (May 25, 2012), [http://www.nasa.gov/home/hqnews/2012/may/HQ\\_12-172\\_SpaceX\\_Dragon\\_Berth.html](http://www.nasa.gov/home/hqnews/2012/may/HQ_12-172_SpaceX_Dragon_Berth.html).

<sup>2</sup> *SpaceX Readies for Second Flight to the International Space Station*, SPACE X (Aug. 23, 2012), <http://www.spacex.com/news/2013/02/08/spacex-readies-second-flight-international-space-station>; Doug Messier, *NASA Commercial Crew and Cargo Awards Approaching \$1 Billion*, PARABOLIC ARC (Apr. 25, 2011, 12:15 PM), <http://www.parabolicarc.com/2011/04/25/nasa-commercial-crew-cargo-award-commit-1-billion/>.

<sup>3</sup> See Trent J. Perrotto & Josh Byerly, *First Contracted SpaceX Resupply Mission Launches with NASA Cargo to Space Station*, NASA (Oct. 7, 2012), [http://www.nasa.gov/home/hqnews/2012/oct/HQ\\_12-355\\_SpaceX\\_CRS-1\\_Launch.html](http://www.nasa.gov/home/hqnews/2012/oct/HQ_12-355_SpaceX_CRS-1_Launch.html).

<sup>4</sup> See Emi Kolawole, *NASA Awards Multimillion-Dollar Contracts to Boeing, SpaceX and Sierra Nevada for Human Spaceflight*, WASH. POST (Aug. 3, 2012, 1:12 PM), [http://www.washingtonpost.com/blogs/innovations/post/nasa-awards-multimillion-dollar-contracts-to-boeing-spacex-and-sierra-nevada-for-human-spaceflight/2012/08/03/a40938c0-dd89-11e1-af1d-753c613ff6d8\\_blog.html](http://www.washingtonpost.com/blogs/innovations/post/nasa-awards-multimillion-dollar-contracts-to-boeing-spacex-and-sierra-nevada-for-human-spaceflight/2012/08/03/a40938c0-dd89-11e1-af1d-753c613ff6d8_blog.html); Johnson Space Center: Contracts, NASA, <http://www.nasa.gov/centers/johnson/news/contracts/> (last updated Sept. 16, 2013).

contracts can prove critical for a company's space program.<sup>5</sup> In addition to financial barriers, the commercial space industry must overcome unique hurdles in the procurement and enforcement of intellectual property rights.

A considerable amount of commentary addresses the interplay of international treaties and the extraterritorial enforcement of patent rights in space.<sup>6</sup> But few observers have considered the role NASA plays in the commercialization of space technology. When companies contract with NASA, they subject themselves to a range of intellectual property issues. One driving force behind these issues is the dichotomy between the traditional patent grant and NASA's policy to encourage the fullest commercial use of space.

To understand how NASA affects the commercialization of space, this comment analyzes the patent clauses that NASA uses when contracting with commercial companies. Agreements with NASA affect a company's ability to choose its own intellectual property protections, obtain and license patents, build a patent portfolio, and assert its own patent rights. Furthermore, the governing framework of NASA contracts will soon transition from the 1952 Patent Act to the Leahy-Smith America Invents Act (AIA). Significant changes to the U.S. patent system, including inventors' rights, geographic limitations on prior art, and invention disclosure rules, all necessitate a review of NASA's current contractual patent clauses. NASA contracts, their statutory basis, and the policies they affect all influence the commercialization of space.

Part I of this comment analyzes the National Aeronautics and Space Act of 1958 (Space Act) as it pertains to NASA's "other transaction" authority. The evolving policy justifications for the Space Act explain NASA's use of its other transaction authority and its use of invention waiver. Part II reviews the sample patent clauses that NASA uses when contracting with private industry. Many NASA agreements made under the 1952 Patent Act con-

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<sup>5</sup> Lee Roop, *NASA Praises Commercial Space Partners as Federal Budget Battles Near*, AL.COM (Jan. 9, 2013, 4:36 PM), [http://blog.al.com/breaking/2013/01/nasa\\_praises\\_commercial\\_space.html](http://blog.al.com/breaking/2013/01/nasa_praises_commercial_space.html).

<sup>6</sup> See, e.g., Leo B. Malagar & Marlo Apalisok Magdoza-Malagar, *International Law of Outer Space and the Protection of Intellectual Property Rights*, 17 B.U. INT'L L.J. 311 (1999); Theodore U. Ro et al., *Patent Infringement in Outer Space in Light of 35 U.S.C. § 105: Following the White Rabbit Down the Rabbit Loophole*, 17 B.U. J. SCI. & TECH. L. 202 (2011) (explaining the "flag of convenience" loophole that makes enforcing space patents difficult).

tinue under the AIA; therefore, Part II analyzes the effect of the AIA on previously contracted-for patent rights. Part III analyzes recent contracts made between NASA and commercial space companies to assess the negotiability of NASA's sample patent provisions. Finally, Part IV addresses the broader intellectual property issues at stake when companies contract with NASA.

## I. THE NATIONAL AERONAUTICS AND SPACE ACT OF 1958

In the fall of 1957, the Soviet Union launched *Sputnik*, marking the beginning of the Cold War's space race.<sup>7</sup> To close the perceived technological gap between the Soviets and the United States, Congress passed the Space Act.<sup>8</sup> The Space Act created NASA to "research into problems of flight within and outside the [E]arth's atmosphere."<sup>9</sup> In 1984, Congress updated NASA's policy objectives to "seek and encourage, to the maximum extent possible, the fullest commercial use of space."<sup>10</sup>

To achieve its policy directives, NASA has the authority "to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary in the conduct of its work and on such terms as it may deem appropriate, with any . . . person, firm, association, corporation, or educational institution."<sup>11</sup> Notably, while many government agencies enjoy the ability to enter into contracts, joint agreements, and leases, only a few receive "other transaction authority."<sup>12</sup> Contracts created under NASA's other transaction authority are known as Space Act Agreements (SAAs).<sup>13</sup>

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<sup>7</sup> Steve Garber, *Sputnik and the Dawn of the Space Age*, NASA, [www.history.nasa.gov/sputnik](http://www.history.nasa.gov/sputnik) (last updated Oct. 10, 2007).

<sup>8</sup> See *id.*

<sup>9</sup> National Aeronautics and Space Act of 1958, 51 U.S.C. §§ 10101–71302 (2006).

<sup>10</sup> See National Aeronautics and Space Administration Authorization Act of 1985, Pub. L. No. 98-361, § 110, 98 Stat. 422, 426 (codified as amended at 51 U.S.C. § 20102).

<sup>11</sup> 51 U.S.C. § 20113(e) (2006).

<sup>12</sup> Besides NASA, only a select few other agencies have other transaction authority, including the Department of Defense, Department of Energy, Department of Homeland Security, and the Department of Transportation. See David S. Schuman, *Space Act Agreements: A Practitioner's Guide*, 34 J. SPACE L. 277, 279 n.8 (2008).

<sup>13</sup> See NASA, POLICY DIRECTIVE 1050.1I, AUTHORITY TO ENTER INTO SPACE ACT AGREEMENTS (Dec. 23, 2008).

To appreciate the power and flexibility of SAAs, it is helpful to understand what these agreements are not. Federal Acquisition Regulations (FARs) cover government procurement contracts, grants, and cooperative agreements.<sup>14</sup> The FAR System creates a set of regulations and policies that executive agencies must follow when soliciting, awarding, and administering government contracts.<sup>15</sup> Parties alleging a violation of an acquisition regulation may file a grievance with the Government Accountability Office's (GAO) Comptroller General.<sup>16</sup> Once a claim is filed, the contracting agency may not award the procurement contract until the dispute is resolved.<sup>17</sup>

The Comptroller General recently ruled on whether FARs apply to SAAs.<sup>18</sup> In early 2006, NASA began accepting proposals for the Commercial Crew/Cargo Project.<sup>19</sup> After receiving proposals, NASA invited six firms to the negotiations phase of the bid.<sup>20</sup> Exploration Partners, LLC was not one of the six.<sup>21</sup> Subsequently, Exploration Partners filed a protest with the Comptroller General alleging violations of federal procurement statutes.<sup>22</sup>

In response to Exploration Partners' protest, NASA argued that SAAs made under its other transaction authority are not procurement contracts and therefore are not subject to FAR and GAO bid-protest review.<sup>23</sup> The Comptroller sided with NASA, finding it persuasive that Congress had delegated "broad authority" to NASA and that Congress had differentiated between "contracts" and "other transaction authority."<sup>24</sup> Going forward, the Comptroller will only review NASA's bid process to

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<sup>14</sup> 48 C.F.R. §§ 1.104, 2.101 (2012).

<sup>15</sup> *Id.* § 1.101; see Surya Gablin Gunasekara, *Other Transaction Authority*, 40 PUB. CONT. L.J. 893, 896 (2011).

<sup>16</sup> 31 U.S.C. § 3552 (2006).

<sup>17</sup> *Id.* § 3553(c)(1). But see *id.* § 3553(c)(2) (allowing an exception if there are compelling circumstances that affect the government's interests).

<sup>18</sup> See *Exploration Partners, LLC*, B-298804, 2006 WL 3734150, at \*1 (Comp. Gen. Dec. 19, 2006).

<sup>19</sup> NASA, ANNOUNCEMENT NO. COTS-01-05, COMMERCIAL ORBITAL TRANSPORTATION SERVICES (2006) (on file with NASA).

<sup>20</sup> See *Exploration Partners, LLC*, 2006 WL 3734150, at \*2.

<sup>21</sup> *Id.*

<sup>22</sup> *Id.*

<sup>23</sup> See *id.* The Comptroller had previously ruled that it would likely not review the award of cooperative agreements or other nonprocurement instruments. See *id.*; see also *Sprint Commc'ns Co., L.P.*, B-256586, 1994 WL 190255, at \*1 (Comp. Gen. May 9, 1994).

<sup>24</sup> See *Exploration Partners, LLC*, 2006 WL 3734150, at \*2-3.

ascertain whether NASA is using SAAs to avoid the requirements of procurement statutes and regulations.<sup>25</sup>

A second distinction between SAAs and procurement contracts is the applicability of the Bayh-Dole University and Small Business Patent Procedures Act (Bayh-Dole Act).<sup>26</sup> The Bayh-Dole Act promotes the utilization of federally funded inventions by allowing small businesses, nonprofits, and universities to retain title to inventions created under government-funded contracts.<sup>27</sup> The Bayh-Dole Act extends not only to procurement contracts but also to grants and cooperative agreements.<sup>28</sup> Additionally, the Bayh-Dole Act takes precedence over other acts that may allocate rights in a different manner, ostensibly including NASA's title-taking authority.<sup>29</sup>

Notwithstanding the Bayh-Dole Act's broad applicability, NASA made the administrative decision that, because SAAs fall under NASA's "other transaction" authority, SAAs are outside the scope of the Bayh-Dole Act.<sup>30</sup> This distinction is especially important for small businesses and universities that contract with NASA because these entities are accustomed to the protections of Bayh-Dole.

Despite the controversial power of SAAs, NASA Attorney-Advisor David Schuman reports that "[i]t would be no exaggeration to state that since the [other transaction] authority was enacted, NASA lawyers have used it to help our clients achieve their mission thousands of times."<sup>31</sup> In fact, NASA enters into roughly 250 SAAs every year.<sup>32</sup> While SAAs are desirable for their flexibility, the absence of a standard one-size-fits-all SAA creates administrative headaches.<sup>33</sup> To overcome this obstacle,

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<sup>25</sup> *Id.* at \*3.

<sup>26</sup> See 35 U.S.C. §§ 200–211 (2006).

<sup>27</sup> *Id.* §§ 200, 202.

<sup>28</sup> See *id.* § 201(b) (defining the term "funding agreement").

<sup>29</sup> See *id.* § 210(a)(7); see also 51 U.S.C. § 20135(b) (2006).

<sup>30</sup> See NASA, ADVISORY IMPLEMENTING INSTRUCTION NAI 1050-1B, SPACE ACT AGREEMENTS GUIDE 41 n.68 (2011) [hereinafter SAA GUIDE] ("SAAs, which are entered into under NASA's 'other transaction' authority, are not Bayh-Dole funding agreements, and the Bayh-Dole Act does not apply."); see also Richard N. Kuyath, *Barriers to Federal Procurement: Patent Rights*, 36 PROCUREMENT L. 1, 17 (explaining that other transaction authority agencies, such as NASA and the Department of Transportation, are exempt from the Bayh-Dole Act).

<sup>31</sup> Schuman, *supra* note 12, at 278.

<sup>32</sup> *The NASA Space Act Agreement: Partnering with NASA*, NASA (Apr. 7, 2010), [http://www.nasa.gov/pdf/440942main\\_Space%20Act.pdf](http://www.nasa.gov/pdf/440942main_Space%20Act.pdf).

<sup>33</sup> See Schuman, *supra* note 12, at 279–81.

NASA relies on several procedures to create consistency from one SAA to another.<sup>34</sup>

First, NASA publishes the Space Act Agreements Guide.<sup>35</sup> This Guide cross-references NASA's policy directives, procedural requirements, and advisory implementing instructions that set the foundation for the SAA provisions.<sup>36</sup> Second, NASA creates its SAAs using a program called the Space Act Agreement Maker (SAAM).<sup>37</sup> Based on relevant factual information, the SAAM creates a first-draft SAA.<sup>38</sup> Understanding the potential clauses that the SAAM may generate is important because they affect a broad array of rights.

## II. SPACE ACT AGREEMENT PATENT CLAUSES

SAAs cover a range of intellectual property issues that may arise during the term of the agreement. NASA relies on three distinct patent clauses to allocate rights while several factors determine which clause applies. If the work is for NASA, the SAA will contain the Title Taking Sample Clause.<sup>39</sup> If the work is not for NASA, NASA will look at the likelihood that inventive activity will take place and use either the Short Form or Long Form Sample Clause.<sup>40</sup> Determining which clause applies will significantly affect the contracting party's patent rights.<sup>41</sup>

Substantive changes to patent law warrant close inspection of each patent clause. Notably, patent rights contracted for under the 1952 Patent Act will take on different meanings under the AIA.<sup>42</sup> Thus, it is important for the SAA partner to understand not only its past rights but also its new rights under the AIA. SAAs also contain provisions not typically seen in FAR contracts. As a result, SAA partners should not assume that NASA retains

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<sup>34</sup> See generally *id.* at 281–83.

<sup>35</sup> See *id.* at 282–83. NASA's Office of the General Counsel oversees the implementation and maintenance of the SAA program. *Id.* at 282.

<sup>36</sup> SAA GUIDE, *supra* note 30, at 1.

<sup>37</sup> Schuman, *supra* note 12, at 281.

<sup>38</sup> *Id.*

<sup>39</sup> See 51 U.S.C. § 20135(b) (2006) (defining when inventions become the exclusive property of NASA); see also SAA GUIDE, *supra* note 30, at 39–43 (differentiating the various patent clauses).

<sup>40</sup> See SAA GUIDE, *supra* note 30, at 42.

<sup>41</sup> *Id.* at 40–43.

<sup>42</sup> See Leahy-Smith America Invents Act (AIA), Pub. L. No. 112-29, 125 Stat. 284 (2011) (to be codified at 35 U.S.C. §§ 1–37) (implementation of the AIA provisions will take place at various times between September 16, 2011, and March 16, 2013).



the standard contractual provisions. With these concerns in mind, the remainder of Part II will analyze the relevant provisions of each patent clause.

### A. THE SHORT FORM SAMPLE CLAUSE

NASA uses the Short Form Sample Clause when the work performed is not for NASA and there is a low chance of inventive activity taking place.<sup>43</sup> These SAAs typically cover nontechnical community outreach and educational ventures.<sup>44</sup> For instance, the NASA HUNCH Program, an innovative program in which high school students apply their math and science skills to fabricate real-world products for NASA, utilizes the Short Form Sample Clause.<sup>45</sup> For many of these educational programs, NASA simply provides a fill-in-the-blank SAA form for the interested party to sign.<sup>46</sup>

In the rare circumstance where inventive activity occurs, the Short Form Sample Clause states:

[T]itle to inventions made (conceived or first actually reduced to practice) under this Agreement remain with the respective inventing party(ies). No invention or patent rights are exchanged or granted under this Agreement. . . . The Parties will consult and agree on the responsibilities and actions to establish and maintain patent protection for joint invention[s] . . . .<sup>47</sup>

Due to the nature of this SAA, parties will likely enter into the agreement with little legal guidance.<sup>48</sup> Confusion may arise as to the actual rights received for patents created under the Short Form Sample Clause. Changes implemented by the AIA may also create confusion as to the rights granted by the Short Form.

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<sup>43</sup> SAA GUIDE, *supra* note 30, at 42.

<sup>44</sup> *See id.* at 42 n.70.

<sup>45</sup> *See generally* NASA HUNCH PROGRAM, <http://nasahunch.com> (last visited June 9, 2013).

<sup>46</sup> *Compare Space Act Agreement Form*, NASA HUNCH PROGRAM, <http://nasahunch.com/wp-content/uploads/2011/07/Space-Act-Agreement-blank.doc> (last visited June 9, 2013), with SAA GUIDE, *supra* note 30, at 80–81.

<sup>47</sup> NASA, INTELLECTUAL PROPERTY RIGHTS—INVENTION AND PATENT RIGHTS (SHORT FORM SAMPLE CLAUSE) ¶ 2, in SAA GUIDE, *supra* note 30, at 80–81 [hereinafter SHORT FORM SAMPLE CLAUSE].

<sup>48</sup> For instance, a school district's superintendent may sign the HUNCH SAA. *See Space Act Agreement*, NASA HUNCH PROGRAM (2012), <http://nasahunch.com/forms/space-act-agreement/>.

On March 16, 2013, under the AIA, the United States switched from a first-to-invent to a first-to-file patent system.<sup>49</sup> This critical change to U.S. patent law affected how and when an inventor qualifies for patent protection.<sup>50</sup> Prior to March 16, 2013, a right to patent protection was based on invention conception, provided the inventor then diligently reduced the invention to practice.<sup>51</sup> In situations where an inventor was the first to conceive but the second to file an application, the U.S. Patent and Trademark Office (USPTO) provided interference proceedings to determine priority of inventorship.<sup>52</sup> The language used in the Short Form Sample Clause, "conceived or first actually reduced to practice," reflects this application of the law.<sup>53</sup>

Since March 16, 2013, priority of invention no longer vests with the first inventor to conceive or reduce an invention to practice but rather with the first inventor to file.<sup>54</sup> In other words, the right to patent protection will go to the first inventor to file even if she is the second inventor to conceive.<sup>55</sup> In furtherance of this change, the AIA replaced interference proceedings with derivation proceedings.<sup>56</sup> Under a first-to-file system, an inventor is limited to arguing that a senior filer derived his invention from the junior-filing inventor.<sup>57</sup>

With these changes in mind, parties to the Short Form Sample Clause should be cognizant that since March 16, 2013, even though they may be the first to conceive of an invention, they have not obtained title to any patent rights. Rather, the contrac-

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<sup>49</sup> See AIA, Pub. L. No. 112-29, § 3, 125 Stat. 284, 293 (2011) (to be codified in scattered sections of 35 U.S.C.).

<sup>50</sup> See *id.*

<sup>51</sup> See *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577 (Fed. Cir. 1996) (explaining that priority of invention goes to the party that can show the earliest date of conception with reasonable diligence in reducing that idea to practice).

<sup>52</sup> See 1952 Patent Act, 35 U.S.C. § 135 (2006) (defining interference proceedings); see also *id.* § 102(g)(1) (establishing that a person is not entitled to patent protection if during the course of an interference proceeding another inventor can prove that her invention was made prior).

<sup>53</sup> See SHORT FORM SAMPLE CLAUSE, *supra* note 47, ¶ 2.

<sup>54</sup> See AIA § 3.

<sup>55</sup> See DONALD S. CHISUM, PRIORITY AMONG COMPETING PATENT APPLICANTS UNDER THE AMERICAN INVENTS ACT (2011), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1969592](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1969592).

<sup>56</sup> See AIA § 3(i) (to be codified at 35 U.S.C. § 135) (replacing the current section on interference proceedings with a discussion of derivation proceedings).

<sup>57</sup> *Id.* § 3(h) (to be codified at 35 U.S.C. § 291).

tual provisions of the Short Form Sample Clause merely give the inventive party the right to file a patent application.

## B. THE LONG FORM SAMPLE CLAUSE

NASA relies on the Long Form Sample Clause when the work to be done is not for NASA, but there is more than a minimal chance that work under the SAA will lead to an invention.<sup>58</sup> In contrast to the Short Form, the Long Form relies on seven provisions to cover a range of potential inventive activity.<sup>59</sup> These provisions outline the parties' licensing, sublicensing, assignment, and patent rights to solely and jointly made inventions.<sup>60</sup>

### 1. *Inventions Made by NASA and Its Related Entities*

Under provisions 2 and 3 of the Long Form, NASA will use "reasonable efforts" to grant a negotiated license to the SAA partner, subject to 37 C.F.R. § 404, for any invention made by NASA or one of its related entities.<sup>61</sup> According to Part 404, the SAA partner must provide a plan for developing or marketing the invention and show that it has the capabilities to carry out the plan.<sup>62</sup> To help facilitate licensing, NASA lists all licensable inventions on its website.<sup>63</sup>

### 2. *Partner's Patent Rights to Joint Inventions*

For inventions jointly created by NASA and the SAA partner, provision 4 of the Long Form Sample Clause requires that "reasonable efforts [be made] to report, and cooperate in obtaining patent protection on, inventions made jointly."<sup>64</sup> As coinventor of jointly made inventions, NASA will receive an undivided in-

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<sup>58</sup> SAA GUIDE, *supra* note 30, at 42.

<sup>59</sup> Compare SHORT FORM SAMPLE CLAUSE, *supra* note 47, ¶ 2, with NASA, INTELLECTUAL PROPERTY RIGHTS—INVENTION AND PATENT RIGHTS (LONG FORM SAMPLE CLAUSE) ¶¶ 2–7, in SAA GUIDE, *supra* note 30, at 81–82 [hereinafter LONG FORM SAMPLE CLAUSE].

<sup>60</sup> LONG FORM SAMPLE CLAUSE, *supra* note 59.

<sup>61</sup> See *id.* ¶ 2 ("Upon request, NASA will use reasonable efforts to grant Partner, under 37 C.F.R. § 404 (2011), a negotiated license to any NASA invention made under this Agreement.").

<sup>62</sup> 37 C.F.R. § 404.5(a)(1) (2012).

<sup>63</sup> NASA Technologies Available for Licensing, NASA (Oct. 31, 2012), [http://www.nasa.gov/offices/oct/stp/communications/rss\\_licensing.html](http://www.nasa.gov/offices/oct/stp/communications/rss_licensing.html).

<sup>64</sup> *Id.*; LONG FORM SAMPLE CLAUSE, *supra* note 59, ¶ 4.

terest in the patent.<sup>65</sup> Absent an agreement to the contrary, a joint owner of a patent “may make, use, offer to sell, or sell the patented invention . . . *without* the consent of and without accounting to the other owners.”<sup>66</sup> To alleviate concerns that NASA will use its ownership interest to the detriment of the SAA partner, provision 4 adds:

Upon timely request, NASA may, at its sole discretion and subject to paragraph 5 of this clause:

- (a) refrain from exercising its undivided interest inconsistently with Partner’s commercial business; or
- (b) use reasonable efforts to grant Partner, under 37 C.F.R. Part 404, an exclusive or partially exclusive negotiated license.<sup>67</sup>

While provision 4 appears to be pro-partner, qualifying for an exclusive or partially exclusive license is more difficult than qualifying for a nonexclusive license.<sup>68</sup> In order for a domestic company to obtain an exclusive license under provision 4(b), the partner must comply with the six requirements of 37 C.F.R. § 404.7.<sup>69</sup> SAA partners should carefully consider this provision because it affects their ability to assert their patent rights against infringers. Receiving an exclusive license may be an integral part in establishing standing should the SAA partner subsequently bring patent infringement suits.

Jointly owned patents can lead to a host of standing issues.<sup>70</sup> Generally, “[a]bsent the voluntary joinder of all co-owners of a patent, a co-owner acting alone will lack standing.”<sup>71</sup> NASA may decide that litigating an infringement claim would go against its policy of commercializing space.<sup>72</sup> NASA can frustrate the partner’s ability to sue infringers by refusing to voluntarily join the

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<sup>65</sup> See, e.g., *Ethicon, Inc. v. U.S. Surgical Corp.*, 135 F.3d 1456, 1465 (Fed. Cir. 1998) (explaining the rule that each coinventor receives a pro rata undivided interest in the patent).

<sup>66</sup> 35 U.S.C. § 262 (2006) (emphasis added).

<sup>67</sup> LONG FORM SAMPLE CLAUSE, *supra* note 59, ¶ 4.

<sup>68</sup> Compare 37 C.F.R. § 404.6 (2012) (nonexclusive licenses), with *id.* § 404.7 (exclusive, co-exclusive, partially exclusive).

<sup>69</sup> *Id.*

<sup>70</sup> *Isr. Bio-Eng’g Project v. Amgen, Inc.*, 475 F.3d 1256, 1264–65 (Fed. Cir. 2007) (explaining the standing requirements for plaintiffs in patent infringement suits).

<sup>71</sup> See *id.*

<sup>72</sup> See *Schering Corp. v. Roussel-UCLAF SA*, 104 F.3d 341, 345 (Fed. Cir. 1997) (explaining that one co-owner can impede the other co-owner’s ability to sue infringers).

patent infringement suit.<sup>73</sup> Absent voluntary joinder, the SAA partner will need to prove it owns a virtual assignment or be able to join NASA as a Rule 19 plaintiff.<sup>74</sup>

Virtual assignment of a patent occurs when an "exclusive license transfers 'all substantial rights' in the patents."<sup>75</sup> Unfortunately, the Federal Circuit has been unclear on what rights constitute "all substantial rights."<sup>76</sup> Nevertheless, courts generally consider the grantee's right to sublicense, the grantor's reversion interest, the grantor's right to receive a portion of the recovery, the duration of the exclusive license, and the limitations on the grantee's ability to assign its interests.<sup>77</sup>

Even if the partner receives a license from NASA, provision 5 reserves several rights for NASA and its related entities.<sup>78</sup> "For inventions made solely or jointly by NASA employees, NASA reserves the irrevocable, royalty-free right of the U.S. Government to practice the invention . . . ."<sup>79</sup> Provision 5 also grants NASA the right to practice the invention or have another entity practice the invention pursuant to "any existing or future treaty."<sup>80</sup> Thus, provision 5 may negatively affect a court's characterization of the exclusive license granted to the SAA partner under provision 4. Additionally, a court may find these government reservations inconsistent with the transfer of a virtual assignment, thus precluding the SAA partner from having standing to unilaterally bring an infringement suit.

If NASA refuses to voluntarily join an infringement suit and the partner lacks an exclusive license, the partner may attempt to join NASA using Rule 19 of the Federal Rules of Civil Procedure.<sup>81</sup> Under Rule 19, the court can make a party who refuses to join the lawsuit an involuntary plaintiff.<sup>82</sup> Yet without an ex-

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<sup>73</sup> See *Isr. Bio-Eng'g Project*, 475 F.3d at 1264.

<sup>74</sup> See FED. R. CIV. P. 19(a) (stating that the court can make a party who refuses to join the lawsuit an involuntary plaintiff).

<sup>75</sup> *Alfred E. Mann Found. for Scientific Research v. Cochlear Corp.*, 604 F.3d 1354, 1359 (Fed. Cir. 2010).

<sup>76</sup> See Timothy Denny Greene, "All Substantial Rights": Towards Sensible Patent Licensee Standing, 22 FED. CIR. B.J. 1, 1 (2012); see also *Cochlear Corp.*, 604 F.3d at 1360–61.

<sup>77</sup> *Cochlear Corp.*, 604 F.3d at 1360–61; *Vaupel Textilmaschinen KG v. Meccanica Euro Italia S.P.A.*, 944 F.2d 870, 875 (Fed. Cir. 1991) ("[I]t is helpful to look at what rights have been retained by the grantor, not only what was granted.").

<sup>78</sup> LONG FORM SAMPLE CLAUSE, *supra* note 59, ¶ 5.

<sup>79</sup> *Id.* ¶ 5(a).

<sup>80</sup> *Id.* ¶ 5.

<sup>81</sup> See FED. R. CIV. P. 19.

<sup>82</sup> *Id.* R. 19(a)(2).

clusive license from NASA, courts may be reluctant to apply Rule 19.<sup>83</sup> The Federal Circuit has repeatedly held that patent co-owners must *voluntarily* consent to join as plaintiffs in a patent infringement suit.<sup>84</sup>

Without all substantial patent rights, the SAA partner remains at the mercy of NASA.<sup>85</sup> To overcome these standing concerns, the SAA partner should negotiate additional rights that accompany the exclusive license, such as the exclusive right to sue infringers.<sup>86</sup> While no such clause exists in any of the sample patent clauses, SAA partners should consider the future standing implications of jointly owning a patent with NASA.

### 3. *Disclosure of Reported Inventions*

Provision 6 of the Long Form Sample Clause deals with the public disclosure of information relating to SAA inventions: "For inventions reported under this clause, the Receiving Party shall withhold all invention reports or disclosures from public access for a reasonable time (1 year unless otherwise agreed or unless restricted longer herein) to facilitate establishment of patent rights."<sup>87</sup> Disclosing an invention prior to filing a patent application can have serious effects on an invention's patentability. To complicate the issue, substantive changes made by the AIA to the definition of what constitutes "prior art" may change the way companies disclose their newly conceived inventions.<sup>88</sup> SAA provisions that were once favorable under the 1952 Patent

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<sup>83</sup> See Richard F. Cahaly, Note, *At Each Other's Mercy: Do Courts Fairly Apply Rule 19 of the Federal Rules of Civil Procedure to Protect Patent Co-Owners' Property Rights?*, 35 SUFFOLK U. L. REV. 671, 681 (2001) (explaining that federal courts have exercised limited use of Rule 19 when there is no exclusive license); see also *AsymmetRx, Inc. v. Biocare Med., LLC*, 582 F.3d 1314, 1321–22 (Fed. Cir. 2009) (explaining one of the policy reasons for Rule 19 is to avoid multiple lawsuits or prevent incomplete relief arising from the same subject matter).

<sup>84</sup> See *Ethicon, Inc. v. U.S. Surgical Corp.*, 135 F.3d 1456, 1467–68 (Fed. Cir. 1998).

<sup>85</sup> See *id.* at 1468 (explaining that the congressional report stated that patent co-owners will be "at the mercy of each other").

<sup>86</sup> See *AsymmetRx*, 582 F.3d at 1319–20 (commenting that the exclusive right to sue is "particularly dispositive" when deciding standing issues); see also *Ethicon*, 135 F.3d at 1468 (explaining that when co-owners grant each other the unilateral right to sue, they waive their right to not join an infringement action); see also *Willingham v. Lawton*, 555 F.2d 1340, 1344–46 (6th Cir. 1977) (stating that a co-owner granting another co-owner "sole discretion" to bring suit will not be protected from such litigation if he later finds it detrimental to his interests).

<sup>87</sup> LONG FORM SAMPLE CLAUSE, *supra* note 59, ¶ 6.

<sup>88</sup> See 37 C.F.R. § 1.131(c) (2012).

Act will take on new relevance as third-party disclosures and traditional one-year grace periods change under the AIA.

For patent applications filed prior to March 16, 2013, the USPTO assigns the patent application a priority date based on the application's effective filing date.<sup>89</sup> If the examiner rejects the application based on prior art that is less than one year older than the priority date, the applicant can "swear back" the reference by proving to the USPTO that the invention was conceived or reduced to practice before the prior art date.<sup>90</sup> This ability created a hard one-year grace period.<sup>91</sup> Thus, there was little benefit in disclosing an invention prior to filing the application under the 1952 Patent Act. Provision 6 embodies this reasoning; NASA gives the partner one year to file a patent application before publically disclosing the invention.<sup>92</sup> Prior to March 16, 2013, once NASA published information regarding the invention, the one-year grace period began.<sup>93</sup> However, the AIA fundamentally changes this thinking.<sup>94</sup>

For applications filed after March 16, 2013, the AIA replaces the hard one-year grace period with a complex set of exceptions to prior art disclosures.<sup>95</sup> Because applicants can no longer rely on their conception date for priority, they will not be able to swear back prior art references. To alleviate this sudden departure from the traditional one-year grace period, Congress created exceptions for inventor and non-inventor disclosures made within one year of the application date.<sup>96</sup>

Section 102(b)(1)(A) of the AIA creates an exception to the prior art disclosure if, within one year before the effective filing date of the invention, a "disclosure was made by the inventor or joint inventor or by another who obtained the subject matter

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<sup>89</sup> See U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 706.02 (9th ed. 2012), available at <http://www.uspto.gov/web/offices/pac/mpep/mpep-2100.pdf>.

<sup>90</sup> See 37 C.F.R. § 1.131 (allowing the applicant to submit an appropriate oath or declaration to establish invention of the subject matter of the rejected claim prior to the effective date of the reference or activity on which the rejection is based).

<sup>91</sup> See Camille M. Barr, *The Section 102 Grace Period Under the America Invents Act: A Novel Source of Litigation*, 4 LANDSLIDE 46, 46 (2012).

<sup>92</sup> LONG FORM SAMPLE CLAUSE, *supra* note 59, ¶ 6.

<sup>93</sup> *Id.*

<sup>94</sup> Barr, *supra* note 91, at 46–47.

<sup>95</sup> AIA § 3(b)(1) (2011) (to be codified at 35 U.S.C. § 102(b)(1)); see also Robert P. Merges, *Priority and Novelty Under the AIA*, 27 BERKELEY TECH. L.J. 1023, 1030 (2012).

<sup>96</sup> AIA § 3(b)(1) (to be codified at 35 U.S.C. § 102(b)).

disclosed directly or indirectly from the inventor or a joint inventor.”<sup>97</sup> Thus, similar to the old § 102(a) provisions, if NASA publishes information provided by the SAA partner regarding solely or jointly made inventions, the disclosure will not be used as prior art against a patent application filed within one year.<sup>98</sup>

The second exception, AIA § 102(b)(1)(B), states that a disclosure made within one year of the filing date will not be prior art if “the subject matter disclosed had, *before* such disclosure, been publicly disclosed by the inventor or a joint inventor or another who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor.”<sup>99</sup> Simply put, “[i]f an inventor does not publicly disclose before a third-party disclosure, there is no grace period for that inventor.”<sup>100</sup> This second exception appears to greatly incentivize early invention disclosure. Under the new law, it may be beneficial for NASA or the partner to publicly disclose inventions sooner than one year. SAA provisions that call for extended periods of nondisclosure, like provision 6, may now work against an inventor.<sup>101</sup> But confounding the issue is the USPTO’s recent explanation of how it plans to enforce § 102(b)(1)(B).<sup>102</sup>

The USPTO’s final rules for enforcing intervening disclosures focus on the particular subject matter of the intervening disclosure.<sup>103</sup> The prior art status of a disclosure depends on whether the subject matter of the disclosure was previously disclosed to the public; the manner in which the disclosure occurred and whether the disclosure was verbatim are not dispositive.<sup>104</sup> For instance, if “the inventor or a joint inventor had publicly disclosed elements A, B, and C, and a subsequent intervening grace period disclosure discloses elements A, B, C, and D, then only element D of the intervening grace period disclosure is available as prior art.”<sup>105</sup> How the USPTO ultimately enforces this exception will play a large role in whether an SAA partner

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<sup>97</sup> *Id.* (to be codified at 35 U.S.C. § 102(b)(1)(A)).

<sup>98</sup> *See id.*

<sup>99</sup> *Id.* (to be codified at 35 U.S.C. § 102(b)(1)(B)) (emphasis added).

<sup>100</sup> *Merges, Priority and Novelty Under the AIA*, *supra* note 95, at 1031.

<sup>101</sup> *See* LONG FORM SAMPLE CLAUSE, *supra* note 59, ¶ 6.

<sup>102</sup> *See* Examination Guidelines for Implementing the First Inventor to File Provisions of the Leahy-Smith America Invents Act, 77 Fed. Reg. 11,059, 11,077 (Feb. 14, 2013).

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

<sup>105</sup> *Id.*



should publicly disclose its invention prior to filing an application.

Finally, SAA partners should consider the effect of NASA invention disclosures on their foreign filing rights. Although the United States has created a quasi-grace period in its first-to-file system, other countries have not.<sup>106</sup> Lowering the one-year protection period of provision 6 may be beneficial for U.S. filings but detrimental to patentability in foreign countries. Thus, under the AIA, SAA partners will have to conduct a careful balancing act, weighing the benefits of U.S. disclosure with the restrictions that arise in foreign countries.

#### 4. Patent Filing Responsibilities and Costs

Provision 7 of the Long Form Sample Clause requires that patent applications based on joint inventions include the following clause: "The invention described herein may be manufactured and used by or for the U.S. Government for U.S. Government purposes without the payment of royalties thereon or therefore."<sup>107</sup> Empirical evidence suggests that NASA is becoming a larger player in the space-technology patent market.<sup>108</sup> From 2003 to 2012, 1,194 patents were issued listing NASA as having a government interest.<sup>109</sup> Interestingly, NASA's involvement in patenting space technology has not been uniform over the past ten years.<sup>110</sup> From 2003 to 2009, the number of patents listing NASA's government interest hovered between 90 and 115 per year.<sup>111</sup> But in 2010, 2011, and 2012, the USPTO issued 166 patents, 153 patents, and 157 patents, respectively.<sup>112</sup> Based on

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<sup>106</sup> Barr, *supra* note 91, at 46. For instance, the European Patent Office has a limited six month grace period. See Convention on the Grant of European Patents (European Patent Convention) art. 55, Oct. 5, 1973, 1065 U.N.T.S. 199 (as amended Nov. 20, 2000).

<sup>107</sup> LONG FORM SAMPLE CLAUSE, *supra* note 59, ¶ 7(b).

<sup>108</sup> A search of the USPTO Patent and Image database was performed using the following terms: Term 1 – "NASA", Field 1 – "GOVT", Term 2 – "20030101->20121231", Field 2 – "ISD." USPTO PATENT FULL-TEXT AND IMAGE DATABASE, <http://patft.uspto.gov/netahtml/PTO/search-bool.html> (last visited Feb. 18, 2013).

<sup>109</sup> *Id.*

<sup>110</sup> *See id.*

<sup>111</sup> Specifically, 2003: 116; 2004: 115; 2006: 100; 2007: 98; 2008: 95; 2009: 110. See, e.g., USPTO PATENT FULL-TEXT AND IMAGE DATABASE SEARCH, <http://patft.uspto.gov/netahtml/PTO/search-bool.html> (For NASA patents in 20xx, search Term 1: "NASA" in Field 1: GOVT; Term 2: "20xx0101->20xx1231" in Field 2: ISD).

<sup>112</sup> *See id.*

this data, over the last decade, almost 40% of patents listing NASA as having a government interest have been issued in just the last three years.<sup>113</sup>

NASA's influence over companies commercializing space will lead to more inventions being subject to NASA control. As a result, SAA partners using the Long Form Sample Clause need to fully understand their patent and licensing rights as applied both before and after March 16, 2013.

### C. THE TITLE TAKING SAMPLE CLAUSE

The Space Act grants NASA title-taking authority, meaning "an invention shall be the exclusive property of the United States if it is made in the performance of any work under any contract of the Administration."<sup>114</sup> Thus, when work is for NASA, the SAA will include the Title Taking Sample Clause.<sup>115</sup> For SAA partners, this raises an important question—when is work "for NASA"?

The SAA funding arrangement offers insight to the question of whether NASA may take title.<sup>116</sup> Reimbursable SAAs require the partner to pay NASA for work that will benefit the partner.<sup>117</sup> It is unlikely that a reimbursable SAA would entitle NASA to use the Title Taking Sample Clause.<sup>118</sup> On the other hand, nonreimbursable SAAs usually involve both parties contributing resources to achieve a mutually beneficial goal.<sup>119</sup> NASA has stated that "[i]f research and development activities of the Partner relate to a cooperative effort 'with NASA' rather than a directed effort 'for NASA,' NASA's title taking authority does not apply."<sup>120</sup>

In addition to any reimbursement arrangements, two other considerations also affect whether the research and development activity qualifies as a cooperative effort.<sup>121</sup> First, NASA

<sup>113</sup>  $[(166 + 153 + 157) / 1194] * 100 = 39.86\%$ .

<sup>114</sup> SAA GUIDE, *supra* note 30, at 43; *see* National Aeronautics and Space Act of 1958, 51 U.S.C. § 20135 (2006).

<sup>115</sup> NASA, INTELLECTUAL PROPERTY RIGHTS—INVENTION AND PATENT RIGHTS (TITLE TAKING SAMPLE CLAUSE), *in* SAA GUIDE, *supra* note 30, at 82–88 [hereinafter TITLE TAKING SAMPLE CLAUSE]; *see also* SAA GUIDE, *supra* note 30, at 43.

<sup>116</sup> SAA GUIDE, *supra* note 30, 12–14.

<sup>117</sup> *Id.* at 12.

<sup>118</sup> *See id.* at 43.

<sup>119</sup> *See* Schuman, *supra* note 12, at 283 (explaining NASA's nonreimbursable agreement with Bigelow Aerospace, LLC to develop inflatable space habitats).

<sup>120</sup> SAA GUIDE, *supra* note 30, at 43 (emphasis added).

<sup>121</sup> *Id.* at 43–44.

looks to the partner's planned use of inventions made under the SAA.<sup>122</sup> If a partner's primary economic rationale for entering into the SAA is to commercialize the technology in an existing commercial market, then NASA will likely categorize the SAA as a cooperative effort.<sup>123</sup> If the primary rationale is to sell the invention to NASA, then the SAA will be categorized as work for NASA and subject to the Title Taking Sample Clause.<sup>124</sup>

A second consideration is whether NASA is entering into the SAA to further an identified mission requirement.<sup>125</sup> If NASA is entering into the nonreimbursable SAA with no clear intention of using the developed technology for a specific agency requirement, then NASA should use either the Short or Long Form Sample Clause.<sup>126</sup> Alternatively, if NASA enters into the SAA to develop or update technology for a specific mission, then NASA should use the Title Taking Sample Clause.<sup>127</sup>

NASA utilizes funded SAAs "when Agency objectives cannot be achieved through any other agreement instrument . . . or a [r]eimbursable or [n]onreimbursable [SAA]."<sup>128</sup> Funded SAAs will almost always cause the agreement to fall under NASA's title-taking authority.<sup>129</sup> Therefore, companies—including partner subcontractors—entering into a funded SAA will be subject to NASA's title-taking authority.<sup>130</sup>

### 1. Definitions

If NASA's title-taking authority applies, it is critical to understand what inventions are subject to forfeiture under the SAA. Within the definitions section of the Title Taking Sample Clause, NASA defines the term "made" to mean "the conception or first actual reduction to practice."<sup>131</sup> The term is frequently found within the phrase "inventions made under this agreement" to grant a range of partner and NASA patent rights.<sup>132</sup> For instance, provision 3(b) prevents NASA from claiming

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<sup>122</sup> *Id.* at 43.

<sup>123</sup> *Id.* at 43–44.

<sup>124</sup> *See id.* at 44.

<sup>125</sup> *Id.*

<sup>126</sup> *Id.*

<sup>127</sup> *Id.*

<sup>128</sup> *See id.* at 15.

<sup>129</sup> *Id.* at 15, 44.

<sup>130</sup> *See id.*

<sup>131</sup> TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 1(d).

<sup>132</sup> *See, e.g., id.* ¶¶ 2(b), 3(b), 6(a)(i).

rights to inventions “not made under this Agreement.”<sup>133</sup> Because NASA has the exclusive right to any invention made under the Title Taking Sample Clause,<sup>134</sup> the definition of “made” is perhaps the single most important definition affecting party rights.

Several factors determine whether an invention is “made” under the SAA: (1) whether the invention was conceived or actually reduced to practice during the SAA; (2) whether the invention relates to the subject matter of the contract; and (3) whether the invention is patentable under Title 35 of the United States Code.<sup>135</sup> The Title Taking Sample Clause includes several provisions to help the government in proving these elements.

First, to aid the government in proving conception, provision 5 requires the SAA partner to disclose inventions and maintain lab notebooks or other records that would tend to prove conception.<sup>136</sup> Alternatively, NASA can take title if the first actual reduction to practice occurs under the SAA.<sup>137</sup> But understanding when the first actual reduction to practice occurs can be difficult.

Reduction to practice can be either actual or constructive.<sup>138</sup> Constructive reduction occurs when a patent application is filed on the invention.<sup>139</sup> Actual reduction occurs when the conceived invention “work[s] for its intended purpose.”<sup>140</sup> Importantly, no actual reduction to practice is required to file a patent application.<sup>141</sup> This distinction is important because the definition of “made” under the Title Taking Sample Clause only includes the first actual reduction to practice.<sup>142</sup> Even if conception and constructive reduction occur prior to the SAA, a

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<sup>133</sup> *Id.* ¶ 3(b).

<sup>134</sup> *Id.*

<sup>135</sup> Carl L. Vacketta & Oliver L. Holmes, *Patent Rights Under Government Contracts*, 83–12 BRIEFING PAPERS 1, 2 (1983).

<sup>136</sup> See TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 5(a) (requiring the SAA partner to maintain lab notebooks or equivalent records).

<sup>137</sup> Vacketta & Holmes, *supra* note 135, at 2.

<sup>138</sup> *Solvay S.A. v. Honeywell Int’l, Inc.*, 622 F.3d 1367, 1376 (Fed. Cir. 2010).

<sup>139</sup> *Id.*

<sup>140</sup> *Id.*

<sup>141</sup> *Hyatt v. Boone*, 146 F.3d 1348, 1352 (Fed. Cir. 1998) (stating that “the inventor need not provide evidence of either conception or actual reduction to practice when relying on content of the patent application”).

<sup>142</sup> See TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 1.

first actual reduction to practice during the term of the SAA may subject the invention to NASA's title-taking authority.<sup>143</sup>

The issue of an invention being "made under" a NASA contract arose in *Hummer v. Administrator of the National Aeronautics and Space Administration*.<sup>144</sup> Hummer conceived of a spin scan camera system for use on space vehicles.<sup>145</sup> He tested his invention and filed a patent application on the device.<sup>146</sup> This invention later became the basis of a contract with NASA.<sup>147</sup> However, when Hummer originally reduced his spin camera to practice, he tested it on a fixed platform; yet Hummer's patent claim required mounting the camera to a rotating body.<sup>148</sup>

The Court of Customs and Patent Appeals ruled that actual reduction to practice requires that a device include every limitation of its patent application claim.<sup>149</sup> Because Hummer failed to mount the camera on a rotating body before entering into the contract with NASA, the first actual reduction to practice embodying every limitation of his patent claim occurred after entering into the contract.<sup>150</sup> Based on the contract's definition of "made"—which was the same as the definition used in the Title Taking Sample Clause—NASA was entitled to the invention.<sup>151</sup>

## 2. Allocation of Principal Rights

Provision 2 of the Title Taking Sample Clause outlines NASA's right to take title, waive title, or license inventions made under the SAA.<sup>152</sup> Under the Title Taking Sample Clause, all inventions made under the SAA are presumptively the exclusive property of NASA.<sup>153</sup>

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<sup>143</sup> See Vacketta & Holmes, *supra* note 135, at 3.

<sup>144</sup> *Hummer v. Adm'r of the Nat'l Aeronautics & Space Admin.*, 500 F.2d 1383, 1388 (C.C.P.A. 1974).

<sup>145</sup> *Id.* at 1386.

<sup>146</sup> *Id.*

<sup>147</sup> *Id.*

<sup>148</sup> *Id.*

<sup>149</sup> *Id.* at 1387; *see also* *UMC Elecs. Co. v. United States*, 816 F.2d 647, 652 (Fed. Cir. 1987) (actual reduction to practice of the invention must include a physical embodiment which includes all limitations of the claim), *overruled on other grounds* by *Scaltech, Inc. v. Rectec/Tetra, L.L.C.*, 269 F.3d 1321 (Fed. Cir. 2001).

<sup>150</sup> *Hummer*, 500 F.2d at 1387-88.

<sup>151</sup> *Id.* at 1388.

<sup>152</sup> TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 2.

<sup>153</sup> *Id.* ¶ 2(a)(i).

NASA receives its authority to take title under 51 U.S.C. § 20135(b)(1).<sup>154</sup> An invention made for NASA will become the exclusive property of the United States if the “person who made the invention was employed or assigned to perform research, development, or exploration work[,] and the invention is related to the work the person was employed or assigned to perform, or was within the scope of the person’s employment duties.”<sup>155</sup> This is true even if the employee did not use government facilities, funds, or proprietary information to make the invention, or created it outside of work.<sup>156</sup> Alternatively, title will vest with NASA if the “person who made the invention was not employed or assigned to perform research . . . but the invention is nevertheless related to the contract, or to the work or duties the person was employed or assigned to perform, and was made during working hours, or with a contribution from the Government.”<sup>157</sup>

Although § 20135(b)(1) is expansive, provision 2 allows NASA to waive rights to any inventions made under the SAA.<sup>158</sup> In accordance with the Presidential Memorandum on Government Patent Policy of February 18, 1983, NASA will waive title to inventions made under the SAA if (1) the “interests of the United States and the general public will be better served”; or (2) the SAA partner is, among other things, making a “substantial contribution of funds, facilities[,] or equipment to the work performed under the award.”<sup>159</sup> Following this directive, NASA’s Title Taking Sample Clause allowed the SAA partner to apply for an advanced or individual waiver of inventions made under the SAA.<sup>160</sup>

There are several important caveats associated with waived inventions. First, advanced waivers apply to *domestic* patent rights.<sup>161</sup> Second, requesting an advanced waiver must take place before the SAA is signed or within thirty days after sign-

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<sup>154</sup> *Id.*

<sup>155</sup> 51 U.S.C. § 20135(b)(1)(A) (2006).

<sup>156</sup> *Id.*

<sup>157</sup> *Id.* § 20135(b)(1)(B).

<sup>158</sup> TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 2(c); *see* 51 U.S.C. § 20135(g).

<sup>159</sup> Presidential Memorandum on Government Patent Policy, 1983 PUB. PAPERS 248, 252 (Feb. 18, 1983); 48 C.F.R. 27.302 (2012).

<sup>160</sup> *See* TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 2(c); *see also* 14 C.F.R. §§ 1245.103(b), 1245.105 (2013).

<sup>161</sup> 14 C.F.R. § 1245.104(a) (emphasis added).

ing.<sup>162</sup> Third, the SAA partner is unlikely to receive a waiver if: (1) it does not have a principal place of business in the United States, is not located in the United States, or is subject to foreign control; (2) the government determines denial is necessary to protect the security of the inventive activities; or (3) waiver would hinder the technology's commercialization.<sup>163</sup>

If NASA denies the advanced waiver or the partner fails to request a waiver within the appropriate time, individual waivers are still available on an invention-by-invention basis.<sup>164</sup> The requirements for receiving an individual waiver are less onerous than advanced waivers but still require applying within a limited window.<sup>165</sup> Provision 2(c)(ii) of the Title Taking Sample Clause states that the partner has eight months—the statutory maximum—after disclosing the invention to file a waiver request.<sup>166</sup> And unlike advanced waivers, which require conformity with 14 C.F.R. § 1245.104(b)(1)–(3), individual waivers only require conformity with 14 C.F.R. § 1245.104(b)(3).<sup>167</sup> Finally, even if NASA grants a waiver, the government still receives an irrevocable, royalty-free license.<sup>168</sup>

### 3. *Invention Disclosures and Reports*

Provision 5 details the internal and external invention reporting procedures required of SAA partners.<sup>169</sup> These disclosure requirements are important, and failure to comply with them can lead to a forfeiture of inventions, loss of invention rights, loss of waiver rights, and revocation of licenses.<sup>170</sup>

Within six months of conception or reduction to practice, the SAA partner must internally report the inventive activity.<sup>171</sup> The partner must report inventive activity to NASA within the earlier

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<sup>162</sup> TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 2(c)(ii); 14 C.F.R. § 1245.104(b).

<sup>163</sup> 14 C.F.R. § 1245.104(b)(1)–(3).

<sup>164</sup> *See id.* § 1245.105.

<sup>165</sup> *See id.*

<sup>166</sup> TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 2(c)(ii); 14 C.F.R. § 1245.105(b)(1).

<sup>167</sup> 14 C.F.R. § 1245.105.

<sup>168</sup> TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 3(a)(i). This also ensures that the government has a property interest in all inventions made under NASA's title-taking authority. *Id.*

<sup>169</sup> *Id.* ¶ 5(a).

<sup>170</sup> 14 C.F.R. § 1245.104(c)(2); TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 4(a) (explaining that a license is granted “unless Partner fails to disclose the invention within the time limits in paragraph 5(b) of this clause”).

<sup>171</sup> TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 5(a).

of two months if documented internally in writing, or six months once made aware of the inventive activity.<sup>172</sup> Additionally, every twelve months, the partner must send NASA a report listing the inventions made during that period.<sup>173</sup> A final report is due within three months after the SAA terminates and must list all the inventions made during the SAA or certify that there were none.<sup>174</sup>

Companies, universities, or organizations unfamiliar with government reporting may find NASA's reporting processes more stringent than their own.<sup>175</sup> Changing administrative policy can also create administrative hardships. For instance, the Invention Management Procedures at the University of North Carolina merely suggest broad timeframes when invention disclosure ranges from "very good" to "very poor."<sup>176</sup> Even if a company is able to implement the required disclosure rules, entering into contracts with multiple government agencies will subject the company to disparate disclosure requirements.<sup>177</sup>

Exasperating this issue is the lack of any extension provision for inadvertent disclosure violations.<sup>178</sup> Simply negotiating the inclusion of FAR 52.227-11(c)(4) creates a process for remedying inadvertent omissions and alleviating the harsh penalties associated with nondisclosure.<sup>179</sup>

#### 4. *Subcontracts and Other Agreements*

Provision 7 of the Title Taking Sample Clause details the contractual clauses NASA requires the SAA partner to include in agreements with subcontractors.<sup>180</sup> The same Title Taking Sample Clause used between NASA and the partner must also be included in any contracts between the SAA partner and a sub-

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<sup>172</sup> *Id.* ¶ 5(b).

<sup>173</sup> *Id.* ¶ 5(c).

<sup>174</sup> *Id.*

<sup>175</sup> See Kuyath, *supra* note 30, at 14 (noting that strict FAR disclosure guidelines often conflict with a commercial company's standard reporting process).

<sup>176</sup> *Invention Management Procedures*, UNIV. OF N.C. AT CHAPEL HILL (Feb. 3, 2009), [http://otd.unc.edu/patent\\_copyright\\_procedures.php](http://otd.unc.edu/patent_copyright_procedures.php).

<sup>177</sup> FAR disclosure requirements—used in standard government procurement contracts—require invention disclosure within two months after the inventor notifies the partner of the invention in writing. While this is similar to provision 5 of the Title Taking Sample Clause, NASA requires earlier disclosure if the partner even knew about the invention. Compare 48 C.F.R. § 52.227-11(c)(1) (2012), with TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 5(b).

<sup>178</sup> See TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 5.

<sup>179</sup> 48 C.F.R. § 52.227-11(c)(4).

<sup>180</sup> TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 7.



contractor.<sup>181</sup> Additionally, the partner “shall not require any Related Entity to assign its rights in inventions made under this Agreement to [the] Partner as consideration for awarding a subcontract.”<sup>182</sup> The partner may only acquire rights to inventions made under the SAA that are necessary “to obtain[ ] and maintain[ ] private support.”<sup>183</sup>

### 5. *March-In Rights*

Provision 9 of the Title Taking Sample Clause defines NASA’s march-in rights.<sup>184</sup> “March-in rights allow the government to ‘march in’ and take over an invention if commercialization of [the] invention is not being executed with due diligence . . . .”<sup>185</sup> March-in rights thus stand in stark contrast to the traditional patent grant, which permits the patent holder to exclude others from making, using, or selling the invention.<sup>186</sup> While NASA has never initiated a march-in proceeding,<sup>187</sup> it nevertheless values the authority because “it helps ensure that federally sponsored research results are commercialized.”<sup>188</sup>

Provision 9’s march-in rights require the SAA partner to grant a responsible applicant a nonexclusive, partially exclusive, or exclusive license to its patent.<sup>189</sup> NASA can grant the license itself if “practical application” of the invention is not accomplished within a reasonable time.<sup>190</sup> While NASA defines “practical application” to mean that “the invention is being used, and [that]

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<sup>181</sup> *Id.* ¶ 7(d).

<sup>182</sup> *Id.*

<sup>183</sup> *Id.* ¶ 7(e)(i).

<sup>184</sup> *Id.* ¶ 9. March-in rights are a cross-over from the Bayh-Dole Act. Rarely were march-in provisions used before the implementation of Bayh-Dole. See John H. Raubitschek & Norman J. Latker, *Reasonable Pricing—A New Twist for March-In Rights Under the Bayh-Dole Act*, 22 SANTA CLARA COMPUTER & HIGH TECH. L.J. 149, 154 (2005).

<sup>185</sup> *In re Roche Molecular Sys., Inc.*, 516 F.3d 1003, 1008 (Fed. Cir. 2008) (emphasis in original).

<sup>186</sup> Compare *id.*, with 35 U.S.C. § 154 (2006); see also 35 U.S.C. § 271(d)(4) (stating that a patent owner will not be denied relief for infringement based on patent misuse if the misuse is for *not* licensing or using the patent).

<sup>187</sup> *In re Roche*, 516 F.3d at 1008.

<sup>188</sup> U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-09-742, INFORMATION ON THE GOVERNMENT’S RIGHT TO ASSERT OWNERSHIP CONTROL OVER FEDERALLY FUNDED INVENTIONS (2009) [hereinafter GAO REPORT].

<sup>189</sup> TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 9.

<sup>190</sup> *Id.* The other march-in rights are violated if: (1) the public use requirements established by federal regulations have not been satisfied; (2) the invention is not being substantially manufactured in the United States; or (3) health or safety needs are not being reasonably satisfied by the Partner. See *id.*

its benefits are publicly available on reasonable terms,” what constitutes reasonable terms is left unclear.<sup>191</sup>

The National Institute of Health (NIH) is the only agency that has received petitions to execute its march-in rights.<sup>192</sup> Petitions relying on a perceived abuse of the reasonable terms requirement may argue that the patentee has failed to implement reasonable market prices or reasonably license its patent.<sup>193</sup> For instance, the American Medical Students Association argued that marching in on a patented anti-AIDS medication would be proper because the patentee was charging U.S. consumers higher prices than consumers in other high-income countries.<sup>194</sup> Third parties can also use march-in provisions as a litigation tool.<sup>195</sup> In 1995, Johns Hopkins University sued CellPro, Inc. for patent infringement of an invention made under an NIH grant.<sup>196</sup> CellPro attempted to circumvent trial proceedings by petitioning the NIH to use its march-in rights and grant CellPro a license to Johns Hopkins’s patent.<sup>197</sup>

While these attempts to obtain a patent license through march-in procedures have not been successful,<sup>198</sup> several changes to the negotiated Title Taking Sample Clause indicate that NASA may be taking these march-in rights more seriously. Therefore, partners with patents encumbered by expanded march-in rights should carefully weigh their options when refusing to license their patents.

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<sup>191</sup> See TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 1(e).

<sup>192</sup> See GAO REPORT, *supra* note 188, at 9 (stating that in the last twenty years, neither the Department of Defense, Department of Energy, nor NASA has received information that would allow them to initiate a march-in proceeding, while the NIH has received several petitions).

<sup>193</sup> See Meredith Wadman, *NIH Asked to Grant Open License on HIV Drug*, NATURE.COM (Nov. 2, 2012, 10:05 PM), <http://blogs.nature.com/news/2012/11/nih-asked-to-grant-open-license-on-hiv-drug.html> (discussing how the phrases “reasonable terms” and “practical application” apply to march-in proceedings).

<sup>194</sup> KNOWLEDGE ECOLOGY INT’L, REQUEST FOR MARCH-IN ON ABBOTT PATENTS FOR RITONAVIR 9 (Oct. 25, 2012), *available at* [http://keionline.org/sites/default/files/2012\\_Oct25\\_Ritonavir\\_march\\_in\\_complaint.pdf](http://keionline.org/sites/default/files/2012_Oct25_Ritonavir_march_in_complaint.pdf).

<sup>195</sup> See *Johns Hopkins Univ. v. CellPro, Inc.*, 152 F.3d 1342, 1346 (Fed. Cir. 1998).

<sup>196</sup> *Id.*; see Mary Eberle, Comment, *March-In Rights Under the Bayh-Dole Act: Public Access to Federally Funded Research*, 3 MARQ. INTELL. PROP. L. REV. 155, 159, 163 (1999).

<sup>197</sup> See Eberle, *supra* note 196, at 164 (explaining that CellPro petitioned the NIH to march-in eight days before the second jury’s verdict).

<sup>198</sup> See GAO REPORT, *supra* note 188, at 9.

Although the foregoing discussion on the Short Form, Long Form, and Title Taking Sample Clauses was not exhaustive, it covered an array of potential issues that SAA partners may encounter. Importantly, these are only the sample clauses; how private companies negotiate to amend these clauses is equally illustrative of NASA's role in commercializing space.

### III. DEVIATIONS FROM THE SAMPLE PATENT CLAUSES

The SAA Guide helps NASA maintain uniformity amongst SAAs created by the various NASA centers.<sup>199</sup> However, because the Space Act allows for flexibility in the allocation of intellectual property rights, these clauses may change to fit the needs of a partner's particular circumstances.<sup>200</sup> The negotiated changes help illustrate the concerns contracting parties have regarding their intellectual property rights.

#### A. DEVIATIONS FROM THE LONG FORM SAMPLE CLAUSE

In 2008, NASA entered into an SAA with Ad Astra Rocket Company to facilitate and conduct test flights of Ad Astra's previously developed VASIMR™ propulsion engine.<sup>201</sup> Because this was primarily a service contract and the work was not for NASA, the SAA used the Long Form Sample Clause.<sup>202</sup>

However, the negotiated SAA with Ad Astra included several changes to the sample clause.<sup>203</sup> First, the clause was amended such that NASA must use "reasonable efforts to grant AD ASTRA . . . a license on terms to be subsequently negotiated to any such invention on which NASA has acquired title *and decides to file a patent application*."<sup>204</sup> This language differs from the sample patent clause, which entitled Ad Astra to a license for any invention that NASA had acquired title to.<sup>205</sup> Second, the negotiated SAA amended the Protection of Reported Inventions provi-

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<sup>199</sup> *Supra* Part I; *see generally* SAA GUIDE, *supra* note 30.

<sup>200</sup> SAA GUIDE, *supra* note 30, at 32.

<sup>201</sup> *See* NASA & AD ASTRA ROCKET CO., NONREIMBURSABLE SPACE ACT AGREEMENT art. 2 (Dec. 2008) [hereinafter Ad ASTRA SAA] (stating that the purpose of the agreement is to conduct space test flights of the VASIMR engine).

<sup>202</sup> *Compare* Ad ASTRA SAA, *supra* note 201, at 14–17, with LONG FORM SAMPLE CLAUSE, *supra* note 59.

<sup>203</sup> *Id.*

<sup>204</sup> Ad ASTRA SAA, *supra* note 201, art. 11.3 (emphasis added).

<sup>205</sup> LONG FORM SAMPLE CLAUSE, *supra* note 59, ¶ 3.

sion.<sup>206</sup> Instead of withholding inventive activity from the public for one year, NASA will withhold information for two years.<sup>207</sup>

## B. DEVIATIONS FROM THE TITLE TAKING SAMPLE CLAUSE

The Title Taking Sample Clause assumes new form under the three recent Commercial Orbital Transportation Services (COTS) SAAs and five Commercial Crew Development (CCDev) SAAs detailed below. The stated objectives of the COTS and CCDev SAAs are to: (1) “stimulate commercial enterprises in space”; (2) establish “cost effective access to low-Earth orbit” facilitated by private industry; and (3) create a new market for commercial space transportation that will be available to government and private sector customers.<sup>208</sup> Due to the nature of the agreements—work done for NASA—both the COTS and CCDev SAAs use the Title Taking Sample Clause.<sup>209</sup>

The negotiated SAAs included several uniform changes and several contract-specific changes. These differences may be instructive as to which patent rights NASA is willing to negotiate on an agreement-to-agreement basis and which changes are universal.

### 1. Removal of Domestic Manufacturing Requirements

All eight SAAs removed the requirement to manufacture inventions in the United States.<sup>210</sup> This change included removal of provision 8, “Preference for United States manufacture,” as well as the associated march-in provision.<sup>211</sup> While this change may provide economic benefits for companies that manufacture products outside of the United States, changes to the geo-

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<sup>206</sup> Compare AD ASTRA SAA, *supra* note 201, art. 11(6), with LONG FORM SAMPLE CLAUSE, *supra* note 59, ¶ 6.

<sup>207</sup> *Id.*

<sup>208</sup> See, e.g., SPACE ACT AGREEMENT NO. NJ06TA26S BETWEEN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND SPACE EXPLORATION TECHNOLOGIES CORP. FOR COMMERCIAL ORBITAL TRANSPORTATION SERVICES DEMONSTRATION (COTS) (2006), available at [http://www.nasa.gov/centers/johnson/pdf/189228main\\_setc\\_nnj06ta26a.pdf](http://www.nasa.gov/centers/johnson/pdf/189228main_setc_nnj06ta26a.pdf) [hereinafter SPACE X COTS SAA].

<sup>209</sup> See, e.g., SPACE ACT AGREEMENT NO. NNJ10TA02S BETWEEN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND BLUE ORIGIN, LLC FOR COMMERCIAL CREW DEVELOPMENT (CCDev) (2010), available at [http://www.nasa.gov/centers/johnson/pdf/471971main\\_NNJ10TA02S\\_blue\\_origin\\_SAA\\_R.pdf](http://www.nasa.gov/centers/johnson/pdf/471971main_NNJ10TA02S_blue_origin_SAA_R.pdf).

<sup>210</sup> Compare TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 1(g), with SPACE X COTS SAA, *supra* note 208, art. 13.

<sup>211</sup> Compare TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 1(g), with SPACE X COTS SAA, *supra* note 208, art. 13.

graphic restrictions affecting patent novelty will require examination of those benefits.

The 1952 Patent Act placed geographic restrictions on several types of novelty-defeating prior art.<sup>212</sup> Only if the invention was “known or used by others *in this country*” or “in public use or on sale *in this country*” would the activity preclude patentability.<sup>213</sup> However, the AIA has removed these geographic restrictions.<sup>214</sup> According to the new law, if the invention is “described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention,” the actions may prevent patentability.<sup>215</sup> Therefore, while partners may have the freedom to manufacture throughout the world, they should be cognizant that certain actions, even if they occur outside the United States, may prevent patentability.

## 2. *Changes to the Allocation of Principal Rights*

The most notable change to the negotiated SAAs is NASA’s intention to waive its title-taking authority. Provision 14.B(3)(b) of Boeing’s CCDev SAA is representative:

Waiver of Rights[—]NASA has determined that to stimulate and support the capability of a United States commercial provider to provide commercial crew space transportation services to the public and the Federal Government, the interest of the United States would be served by waiving to Boeing, in accordance with provisions of 14 C.F.R. Part 1245, Subpart 1, rights to inventions made by Boeing in the performance of work under this Agreement.<sup>216</sup>

Nevertheless, this is merely a statement of intention; partners still have to comply with the advanced waiver or individual waiver procedures to secure title to their inventions.<sup>217</sup>

Although NASA intends to waive its title-taking authority, the SAAs offer little guidance on how to exempt specific technolo-

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<sup>212</sup> See 35 U.S.C. § 102(a) (2006).

<sup>213</sup> *Id.* § 102(a), (b) (emphasis added).

<sup>214</sup> Compare AIA § 3(b)(1) (2011) (to be codified at 35 U.S.C. § 102(a)(1)), with 1952 Patent Act, 35 U.S.C. § 102(a), (b) (2006).

<sup>215</sup> AIA § 3(b)(1) (to be codified at 35 U.S.C. § 102(a)(1)).

<sup>216</sup> SPACE ACT AGREEMENT NO. NNJ10TA07S BETWEEN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND THE BOEING COMPANY FOR COMMERCIAL CREW DEVELOPMENT (CCDev) (2010), available at [http://www.nasa.gov/centers/johnson/pdf/475893main\\_NNJ10TA07S\\_Boeing\\_SAA-R\\_new.pdf](http://www.nasa.gov/centers/johnson/pdf/475893main_NNJ10TA07S_Boeing_SAA-R_new.pdf) [hereinafter BOEING CCDev SAA].

<sup>217</sup> See *id.* art. 14.B.1.b.

gies. For example, SpaceX's SAA states that NASA will not obtain rights in pre-existing inventions provided that the SAA includes a suitable restrictive notice.<sup>218</sup> Alternatively, Orbital's SAA clearly states that "NASA obtains no right in pre-existing Inventions, except for Inventions made under this Agreement."<sup>219</sup> Furthermore, Orbital insulated its previously developed technology from the SAA's provisions with the following statement: "For the avoidance of doubt, any inventions made in the development of Taurus II shall not be considered inventions made under this Agreement."<sup>220</sup> Thus, Orbital's Taurus II technology is exempted from the SAA provisions.<sup>221</sup>

This additional provision is instructive for commercial companies wanting to explicitly remove certain technologies from NASA's title-taking authority. Once a technology is subject to the Title Taking Sample Clause, there are myriad ways NASA can use its licensing or title-taking rights to affect a company's intellectual property.

### 3. *Changes to the Government's Minimal Rights*

All eight of the reviewed SAAs amend the government's minimum rights to inventions made under the SAA.<sup>222</sup> These changes balance NASA's interest in commercializing space with providing an incentive for the private development of technology.

In the negotiated SAAs, NASA includes two incentives for the expedient completion of milestones.<sup>223</sup> First, NASA will not exercise its irrevocable, royalty-free license during the term of the SAA.<sup>224</sup> Second, once all milestones are completed, NASA will refrain from exercising its irrevocable license "for a period of five (5) years following the expiration of th[e] Agreement or until December 31, 2015, whichever is later."<sup>225</sup> Interestingly,

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<sup>218</sup> SPACEX COTS SAA, *supra* note 208, art. 13.

<sup>219</sup> SPACE ACT AGREEMENT NO. NNJ08TA32S BETWEEN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND ORBITAL CORPORATION FOR COMMERCIAL ORBITAL TRANSPORTATION SERVICES DEMONSTRATION (COTS) (2008), *available at* [http://www.nasa.gov/centers/johnson/pdf/214893main\\_Orbital\\_COTS\\_Ph1\\_Redacted\\_SAA\\_2\\_27\\_08.pdf](http://www.nasa.gov/centers/johnson/pdf/214893main_Orbital_COTS_Ph1_Redacted_SAA_2_27_08.pdf) [hereinafter ORBITAL COTS SAA].

<sup>220</sup> *Id.* art. 13.B.1.a.

<sup>221</sup> *See id.*

<sup>222</sup> Compare TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 3, with BOEING CCDEV SAA, *supra* note 216, art. 14.C.

<sup>223</sup> *See, e.g.*, ORBITAL COTS SAA, *supra* note 219, art. 13.C.

<sup>224</sup> *Id.* art. 13.C.2.

<sup>225</sup> *See, e.g., id.* art. 13.C.3.

this time period was not uniform amongst the examined SAAs. SpaceX negotiated this time period to terminate on December 31, 2020,<sup>226</sup> while Kistler Aerospace Corporation negotiated the time period to last until December 31, 2020, or ten years following the expiration of the agreement, whichever is later.<sup>227</sup>

These provisions strike a balance between NASA's interest in commercializing space and the realization that exclusive rights drive innovation.<sup>228</sup> If a partner can achieve its milestones, provisions 13.C.2 and C.3 may prevent NASA from using its government license for a significant portion of an invention's patent term.<sup>229</sup> This incentivizes completion of SAA goals while allowing companies to benefit from the exclusive patent grant.

#### 4. *Changes to the Rights of Subcontractors and Related Entities*

In the negotiated SAAs, NASA makes an important distinction between inventions made by the SAA partner and inventions made by related entities of the SAA partner. Although NASA waives title to inventions made by the SAA partner, NASA does not extend this promise to subcontractors.<sup>230</sup> The negotiated SAA requires that subcontracts replace the intention-to-waive provision with the Title Taking Sample Clause.<sup>231</sup> Furthermore, unlike the sample clause provisions, the SAA partner may now require the subcontractor to assign its rights in inventions as a contractual obligation.<sup>232</sup>

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<sup>226</sup> SPACEX COTS SAA, *supra* note 208, art. 13.C.3.

<sup>227</sup> SPACE ACT AGREEMENT NO. NNJ06TA27S BETWEEN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AND KISTLER AEROSPACE CORPORATION AND ROCKET-PLANE LIMITED, INC. FOR COMMERCIAL ORBITAL TRANSPORTATION SERVICES DEMONSTRATION (COTS) (2006), *available at* [http://www.nasa.gov/centers/johnson/pdf/189226main\\_kistler\\_nnj06ta27s.pdf](http://www.nasa.gov/centers/johnson/pdf/189226main_kistler_nnj06ta27s.pdf) [hereinafter KISTLER COTS SAA].

<sup>228</sup> See Robert P. Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CALIF. L. REV. 803, 806 (1988) (stating the premise that patents create an incentive to innovate).

<sup>229</sup> See, e.g., ORBITAL COTS SAA, *supra* note 219; SPACEX COTS SAA, *supra* note 208; KISTLER COTS SAA, *supra* note 227.

<sup>230</sup> See, e.g., BOEING CCDEV SAA, *supra* note 216, art. 14.G.1.

<sup>231</sup> See, e.g., *id.* art. 14.G.1.b; TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 2(c)(ii).

<sup>232</sup> Compare TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 7(d), with BOEING CCDEV SAA, *supra* note 216, art. 14.G.

### 5. Broadening the Scope of Government March-In Rights

The government has expanded NASA's march-in ability in each of the eight negotiated SAAs.<sup>233</sup> In addition to the original march-in rights (excluding the domestic manufacturing requirements), NASA may now march in if the SAA partner has: (1) "achieved practical application of such invention, [but] has failed to maintain practical application of such invention in such field of use"; or (2) "discontinued making the benefits of such invention available to the public or to the Federal Government."<sup>234</sup> This expansion of power raises several concerns.

SAA partners may be without procedural safeguards should NASA enforce its march-in provisions. The Bayh-Dole Act governs traditional government-funded contracts allowing agency march-in.<sup>235</sup> Agencies must follow specific federal regulations if they wish to assert their march-in rights.<sup>236</sup> These procedures cover notification requirements, evidentiary proceedings, and the judicial appeals process.<sup>237</sup> But NASA's march-in rights emanate from its "other transaction" authority, not the Bayh-Dole Act.<sup>238</sup> NASA has already established its propensity to act outside of FAR procedures;<sup>239</sup> it follows that NASA may refuse to follow established march-in procedures. Therefore, partners should negotiate for the inclusion of express procedural safeguards, such as FAR 27.304.1(g).

In addition to the procedural issues, marching in will have considerable technological and economic repercussions. The GAO has cautioned that marching in could have a chilling effect on private investment and jeopardize the establishment of technological know-how.<sup>240</sup> This may be particularly troublesome for the diffusion of space industry knowledge, as NASA has historically been one of the few entities with a space program. Further-

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<sup>233</sup> Compare TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 9, with ORBITAL COTS SAA, *supra* note 219, art. 13.H.

<sup>234</sup> ORBITAL COTS SAA, *supra* note 219, art. 13.H.1.b-c.

<sup>235</sup> See 35 U.S.C. § 208 (2006).

<sup>236</sup> *Id.* § 203(b); see also 48 C.F.R. § 27.304-1(g) (2012) ("When exercising march-in rights, agencies shall follow the procedures set forth in 37 C.F.R. [§] 401.6.").

<sup>237</sup> See 37 C.F.R. § 401.6 (2012); see GAO REPORT, *supra* note 188, at 6 (explaining the thirty-day notice requirement and what information may be submitted).

<sup>238</sup> See Kuyath, *supra* note 30, at 16-17.

<sup>239</sup> See Exploration Partners, LLC, B-298804, 2006 WL 3734150, at \*1 (Comp. Gen. Dec. 19, 2006).

<sup>240</sup> See GAO REPORT, *supra* note 188, at 14-17 (explaining four key disincentives that prevent federal agencies from using Bayh-Dole march-in authority).



more, NASA's additional march-in rights impact the free market's effect on space technology. Allowing NASA to march in if the SAA partner achieved practical application of the invention but discontinued such use may overlook the free market's influence on a technology's commercial feasibility.<sup>241</sup> NASA should temper its desire to commercialize space with the realization that commercial companies are well suited to evaluate the feasibility of new technologies.<sup>242</sup>

Ultimately, amendments to the sample SAA provisions offer both parties a chance to protect their monetary and technological investments. SAA partners should carefully inspect amendments to the sample provisions made by NASA, as these changes alter the partner's rights to the inventions created under the SAA. Furthermore, SAA partners should consider the tangential intellectual property issues that SAAs create.

#### IV. RELATED CONTRACTING CONCERNS

As Parts II and III discussed, NASA has become proactive in the patenting and licensing of space technology. NASA has liberally granted waivers to patent inventions while retaining property rights in the form of irrevocable licenses.<sup>243</sup> NASA relies on SAAs to cover myriad patent issues, but these contractual provisions expose companies to additional intellectual property concerns.<sup>244</sup>

Under the current SAA provisions, companies have a questionable ability to choose their own intellectual property protections. Even if a company desires patent protection, the government's march-in rights may limit the manner in which companies commercialize their patents. Additionally, the combination of space technology and NASA's retained property interest expose inventions to increased security scrutiny. Companies should consider the noncontractual implications that arise when working with NASA.

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<sup>241</sup> See *Commercializing Space: Hearing Before the Subcomm. on Space and Aeronautics of the H. Comm. on Science*, 106th Cong. 4 (2000), available at <http://www.rff.org/RFF/Documents/RFF-CTst-00-macauley-July18.pdf> (statement of Dr. Molly K. Macauley, Senior Fellow, Resources for the Future).

<sup>242</sup> See George Landrith, *SpaceX: Solydra in Space*, BREITBART (Aug. 24, 2012), <http://www.breitbart.com/Big-Government/2012/08/24/Solyndra-in-Space> (discussing the free-market approach to space exploration with the undertones that SpaceX may be the next Solyndra).

<sup>243</sup> *Supra* Parts II–III.

<sup>244</sup> *Supra* Parts II–III.

## A. AUTONOMY IN CHOOSING INTELLECTUAL PROPERTY RIGHTS

The CEO of SpaceX recently made headlines by stating: “We have essentially no patents in SpaceX. Our primary long-term competition is in China—if we published patents, it would be farcical, because the Chinese would just use them as a recipe book.”<sup>245</sup> A search for patents owned by SpaceX returns just a single patent,<sup>246</sup> supporting the implication that SpaceX has chosen trade secret protection over patent law. Despite this decision, SpaceX’s SAA will dictate the type of protection it may obtain.<sup>247</sup> Yet the AIA may have created a loophole for companies to retain trade secret protection while also fulfilling their contractual obligations.

There are several reasons why a company may wish to use trade secrets. As SpaceX and others have articulated, enforcing patent rights to space technology is difficult.<sup>248</sup> Furthermore, unlike patents, which have a term of twenty years,<sup>249</sup> the life of a trade secret is potentially indefinite.<sup>250</sup> This distinction is especially important in the space industry, where startup costs are significant and space vehicle commissions last for decades.<sup>251</sup> Finally, patent applications must disclose the “best mode contem-

<sup>245</sup> *Elon Musk—CEO and Chief Designer*, SPACEX (2013), <http://www.spacex.com/elon-musk.php>; Chris Anderson, *Elon Musk’s Mission to Mars*, WIRED (Oct. 21, 2012, 3:00 PM), <http://www.wired.com/wiredscience/2012/10/ff-elon-musk-qa/all/>.

<sup>246</sup> See USPTO PATENT FULL-TEXT AND IMAGE DATABASE SEARCH, <http://patft.uspto.gov/netahtml/PTO/search-bool.html> (Term 1: “SpaceX”; Field 1: Assignee Name; Term 2: “Space Exploration Technologies”; Field 2: Assignee Name; Boolean Operator should be OR).

<sup>247</sup> All three SAA patent clauses require the partner to obtain patent protection. The Short Form Sample Clause requires that for jointly made inventions, “[t]he [p]arties will consult and agree on the responsibilities and actions to *establish and maintain patent protection for joint invention[s]*.” SHORT FORM SAMPLE CLAUSE, *supra* note 47, ¶ 2 (emphasis added). The Long Form states that “[p]arties will use reasonable efforts to *report, and cooperate in obtaining patent protection on, inventions made jointly*.” LONG FORM SAMPLE CLAUSE, *supra* note 59, ¶ 4 (emphasis added). The Title Taking Clause requires that the “[p]artner shall execute all papers necessary to file patent applications and establish the Government’s rights.” TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 5(d).

<sup>248</sup> See Ro et al., *supra* note 6, at 224.

<sup>249</sup> 35 U.S.C. § 154(a)(2) (2006).

<sup>250</sup> Katarzyna A. Czapracka, *Antitrust and Trade Secrets: The U.S. and the EU Approach*, 24 SANTA CLARA COMPUTER & HIGH TECH. L.J. 207, 237 (2008) (explaining that trade secrets are distinguished from patents and copyrights in that they are not subject to any time limitation).

<sup>251</sup> NASA’s Space Shuttle Endeavor completed twenty-five missions in almost twenty years, while the Space Shuttle Atlantis completed thirty-three missions during almost twenty-six years of operation. See *Space Shuttle Launches*, NASA (July

plated by the inventor for carrying out his invention.”<sup>252</sup> Patentees are not permitted to disclose the “second-best embodiment” of their invention “while retaining the best for [themselves].”<sup>253</sup> Yet recent changes by the AIA to the best mode requirement may have opened the door for companies to receive both patent and trade secret protection.<sup>254</sup>

Under the 1952 Patent Act, a defendant to a patent infringement suit could invalidate a patent by showing that the patentee failed to disclose the best mode of practicing the invention.<sup>255</sup> The AIA amended this requirement by providing that the best mode requirement is no longer a means to invalidate a patent during litigation.<sup>256</sup> This leaves the USPTO as the sole enforcer of the best mode requirement; yet even the USPTO has conceded that “[i]t is extremely rare that a best mode rejection properly would be made in *ex parte* prosecution.”<sup>257</sup>

In most states, trade secret protection is obtainable for “information . . . that . . . derives independent economic value . . . from *not being generally known to*, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use.”<sup>258</sup> Disclosing the preferred embodiment of an invention will likely prevent concurrent trade secret and patent protection.<sup>259</sup> While the AIA may allow for both trade secret protection and patent protection, overcoming an SAA’s disclosure provisions may be a greater barrier to trade secret protection.

Assuming NASA has waived its title-taking authority, the SAA partner must file a patent application on inventions made under the SAA and disclose all inventive activity to NASA.<sup>260</sup> Once disclosed, NASA only withholds the information from the public

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25, 2011), [http://www.nasa.gov/pdf/537939main\\_ss-launches-080311.pdf](http://www.nasa.gov/pdf/537939main_ss-launches-080311.pdf) (detailing the missions of each of NASA’s five Space Shuttles from 1981 until 2011).

<sup>252</sup> 35 U.S.C. § 112; *see also* Kuyath, *supra* note 30, at 13.

<sup>253</sup> *In re Nelson*, 280 F.2d 172, 184 (C.C.P.A. 1960), *overruled on other grounds by In re Kirk*, 376 F.2d 936, 946 (C.C.P.A. 1967).

<sup>254</sup> Brian J. Love & Christopher B. Seaman, *Best Mode Trade Secrets*, 15 YALE J.L. & TECH. 1, 3–4 (2012).

<sup>255</sup> 35 U.S.C. § 282.

<sup>256</sup> AIA § 15(a) (to be codified at 35 U.S.C. § 282).

<sup>257</sup> MANUAL OF PATENT EXAMINING PROCEDURE § 2165.03 (8th ed. 2012); *see also* Love & Seaman, *supra* note 254, at 12–13.

<sup>258</sup> Love & Seaman, *supra* note 254, at 6 (quoting the Uniform Trade Secrets Act § 1(4)(i) (1985)) (emphasis added).

<sup>259</sup> *Id.*

<sup>260</sup> TITLE TAKING SAMPLE CLAUSE, *supra* note 115, ¶ 5.

for a reasonable time so that the SAA partner can establish its patent rights.<sup>261</sup> Once NASA discloses the invention, trade secret protection is likely unobtainable. Yet there is no requirement for the SAA partner to disclose the best mode to NASA; the SAA only requires that “[i]nvention disclosures shall . . . be sufficiently complete in technical detail to convey a clear understanding of the nature, purpose, operation, and physical, chemical, biological, or electrical characteristics of the invention.”<sup>262</sup> Although the SAA leaves the door open for partners to retain the best embodiment of their invention,<sup>263</sup> withholding inventive activity from NASA is fraught with peril. Specifically, failure to disclose inventive activity may entitle NASA to revoke a partner’s minimum rights in the invention.<sup>264</sup>

#### B. SECRECY ORDERS FOR SPACE TECHNOLOGY

As discussed above, a search for patents owned by SpaceX returns only a single patent, patent number 7,503,511 (‘511 patent).<sup>265</sup> SpaceX filed an application for the ‘511 patent on August 4, 2005, claiming priority to a provisional application filed on September 8, 2004.<sup>266</sup> The application published on January 8, 2009, and issued on March 17, 2009.<sup>267</sup> This timeline is notable because it is the policy of the USPTO that “each application for a patent shall be published . . . promptly after the expiration of a period of 18 months from the earliest filing date for which a benefit is sought under this title.”<sup>268</sup> Under this policy, SpaceX’s application should have published in March 2006. This delay highlights another issue commercial space companies must deal with—secrecy orders.

After SpaceX filed its patent application, the USPTO Licensing and Review Board flagged it for a third-level security review, sending the application to the Department of Defense

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<sup>261</sup> *Id.*

<sup>262</sup> *Id.*

<sup>263</sup> *See id.*

<sup>264</sup> *Id.*; *see also* Campbell Plastics Eng’g & Mfg., Inc. v. Brownlee, 389 F.3d 1243, 1249–50 (Fed. Cir. 2004) (ruling that strict compliance with disclosure provisions is required and piecemeal invention disclosure may violate disclosure requirements).

<sup>265</sup> USPTO PATENT FULL-TEXT AND IMAGE DATABASE SEARCH, *supra* note 246; U.S. Patent No. 7,503,511 (filed Aug. 4, 2005).

<sup>266</sup> U.S. Patent No. 7,503,511, at [22], [60] (filed Aug. 4, 2005).

<sup>267</sup> *Id.* at [45], [65].

<sup>268</sup> MANUAL OF PATENT EXAMINING PROCEDURE, *supra* note 257, § 1120; 35 U.S.C. § 122 (2006).

(DOD).<sup>269</sup> More than three years later, on September 4, 2008, the DOD cleared the patent application for publication.<sup>270</sup> Only then did the USPTO give the application a publication date, as it had recently “been cleared by Licensing & Review or a secrecy order has been rescinded.”<sup>271</sup>

At the end of 2012, there were 5,321 patents currently subject to secrecy orders.<sup>272</sup> Non-DOD agencies—which include NASA and the Department of Energy—filed more secrecy orders in 2011 than in any of the previous twelve years.<sup>273</sup> Private companies should consider how secrecy orders—combined with NASA’s increased participation in the patenting of inventions—may affect their patent rights. Even if an invention is not subject to a secrecy order, the screening process may take several years, thereby delaying the patent’s issuance.<sup>274</sup>

The Invention Secrecy Act of 1951 authorizes the Commissioner of Patents to make available to designated defense agencies for inspection any patent applications that “might . . . be detrimental to the national security.”<sup>275</sup> If the government has a property interest in the invention, a secrecy order will issue if the application’s publication “*might* . . . be detrimental to the national security.”<sup>276</sup> Alternatively, if the government lacks a property interest in the invention, then a secrecy order will only

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<sup>269</sup> *Transaction History*, U.S. PATENT & TRADEMARK OFF., <http://portal.uspto.gov/pair/PublicPair> (search patent number “7503511”; click *Transaction History*) (last visited Sept. 25, 2013).

<sup>270</sup> *See Department of Defense Access Acknowledgement/Secrecy Order Recommendation for Patent Application*, U.S. PATENT & TRADEMARK OFF., (Sept. 4, 2008), <http://portal.uspto.gov/pair/PublicPair> (search patent number “7503511”; click *Image File Wrapper*; click “any document coming from L and R”).

<sup>271</sup> *Notice of New or Revised Projected Publication Date*, U.S. PATENT & TRADEMARK OFF., <http://portal.uspto.gov/pair/PublicPair> (search patent number “7503511”; click *Image File Wrapper*; click “*Notice of New or Revised Publication Date*”) (last visited Sept. 25, 2013).

<sup>272</sup> Letter from Kathryn Siehndel, USPTO FOIA Officer, Office of General Law, to Steven Aftergood, Fed’n of Am. Scientists (Oct. 23, 2012), *available at* <http://www.fas.org/sgp/othergov/invention/stats.pdf> (outlining the use of secrecy orders from 1988 to 2012).

<sup>273</sup> *Id.*

<sup>274</sup> *See, e.g., Department of Defense Access Acknowledgement/Secrecy Order Recommendation for Patent Application*, *supra* note 270; *see also The Secrecy Order Program in the United States Patent & Trademark Office*, FED’N OF AM. SCIENTISTS (June 27, 1991), <http://www.fas.org/sgp/othergov/invention/program.html>.

<sup>275</sup> 35 U.S.C. § 181 (2006).

<sup>276</sup> *Id.* (emphasis added).

issue if publication “*would* be detrimental to the national security.”<sup>277</sup>

The Space Act defines what NASA considers to be detrimental to national security: “No patent may be issued to any applicant other than the Administrator for any invention which appears . . . to have significant utility in the conduct of aeronautical and space activities . . . .”<sup>278</sup> Additionally, the DOD will withhold from the public “any technical data with military or space application in the possession of . . . the [DOD], if such data may not be exported lawfully” outside the United States.<sup>279</sup> In addition to these criteria, Congress has recently considered expanding the use of secrecy orders to inventions that might harm the nation’s economic security.<sup>280</sup>

If a secrecy order issues, its duration will depend on several factors. Generally, unless the United States is at war or the President has declared a national emergency, a secrecy order will last for twelve months and is renewable indefinitely.<sup>281</sup> Improper disclosure of the invention will result in abandonment of the patent application, forfeiture of any claims against the United States resulting from the secrecy order, monetary penalties, and potential prison time.<sup>282</sup> Once the secrecy order issues, a company may have difficulty commercializing its invention.<sup>283</sup>

Under the SAA patent clauses, inventions jointly made or inventions subject to the Title Taking Sample Clause entitle NASA to, at a minimum, a government purpose license. Because the government will have a property interest, the invention is subject to the lower “might” standard for secrecy order protection. Furthermore, if adopted, secrecy orders for economically signifi-

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<sup>277</sup> *Id.* (emphasis added); see also Thomas L. Kundert, *Invention Secrecy Guide: Foreign Filing Licenses, Secrecy Orders and Export of Technical Data in Patent Applications*, 88 J. PAT. & TRADEMARK OFF. SOC’Y 667, 670 (2006).

<sup>278</sup> 51 U.S.C. § 20135(d) (2006).

<sup>279</sup> 32 C.F.R. § 250.4(a) (2012); see also Kundert, *supra* note 277, at 669.

<sup>280</sup> Notice of Request for Comments on the Feasibility of Placing Economically Significant Patents Under a Secrecy Order and the Need to Review Criteria Used in Determining Secrecy Orders Related to National Security, 77 Fed. Reg. 23,662, 23,663 (Apr. 20, 2012).

<sup>281</sup> See 35 U.S.C. § 181. If the United States is at war, then the secrecy order will last until hostilities end, plus one year. See *id.* If the secrecy order issues during a presidentially declared national emergency, then the order lasts for the duration of the emergency plus six months. *Id.*

<sup>282</sup> 35 U.S.C. §§ 182, 186.

<sup>283</sup> See Sabing H. Lee, *Protecting the Private Inventor Under the Peacetime Provisions of the Invention Secrecy Act*, 12 BERKELEY TECH. L.J. 345, 364 (1997) (discussing what the inventor of a patent subject to a secrecy order can do under the order).

cant patents would likely encompass cutting-edge space technology. Thus, even if NASA waives title to an invention made under an SAA, securing patent protection is not a foregone conclusion.

### CONCLUSION

The private space industry is currently in a symbiotic relationship with NASA. NASA funds the development and advancement of space technology while private companies help NASA achieve its administrative obligations. Over time, private companies will become less dependent on NASA as they develop industry know-how, build patent portfolios, and develop testing facilities. Until this happens, SAAs will allow NASA to exercise considerable power in the emerging space industry.

SAAs give NASA power in the negotiation process and considerable control over inventions made under the agreements. Recent changes to U.S. patent law require that NASA and commercial companies reevaluate their contracted-for patent rights. As the United States transitions to the AIA, provisions contracted for under the 1952 Patent Act will require reconsideration.

Companies contracting with NASA will also want to consider the noncontractual implications of using SAAs. SAAs limit the intellectual property protections companies may use and expose new technologies to secrecy orders that may adversely affect the subsequent commercialization of new inventions.

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