# REGULATING ORBITAL DEBRIS: THE FEDERAL COMMUNICATIONS COMMISSION TACKLES SPACE JUNK

MICHAEL S. DODGE, J.D., LL.M.*

## ABSTRACT

In 2018, the president of the United States released Space Policy Directive-3 (SPD-3), which commands several sectors of the federal executive apparatus to reassess their current and future efforts to address space traffic management and space situational awareness issues. The reasons for this Directive can be boiled down to the belief that the continued use of the orbital realm depends on responsible management, which in turn depends on myriad factors that include the development of new technologies, the refinement of data gathering, and the clarification of governmental operational roles. In particular, the Directive calls for enhanced standardization of safety and best practices, and doles out tasks for relevant agencies, among which the Federal Communications Commission (FCC) plays a significant role. Given the FCC's influence on the licensure of satellites and the proliferation of constellations, it has become a leader in fulfilling the obligations set out in SPD-3. In October of 2018, the FCC announced it would revisit its much older orbital debris management rules, set in place initially to address the threat orbital debris poses to the orbital space environment where satellites and other spacecraft operate. The new rules have an eye towards revisions in light of the FCC's responsibility for enhancing the safety of traffic in outer space. In November of 2018, the FCC released its Notice of Proposed Rulemaking (NPRM), in which it tackles a multitude of germane topics from spectrum use to orbital lifetime, and from choice of orbit to post-mission disposal. The comment period opened up in early 2019, and more than eighty comments were submitted to the FCC by various industry representatives, federal agencies, and international entities. Since that time, the Final Rule has been issued, which became effective regulation in late 2020. This article proposes to examine how the FCC's changes address concerns outlined in SPD-3, the

---

*†Assistant Professor & Graduate Program Director, University of North Dakota, Department of Space Studies. I'd like to thank Drs. Diane Howard and Moriba Jah, who, along with their team of excellent student volunteers, helped make this article a reality by giving me a place to test its original version at their Space Traffic Management Conference, held at the University of Texas-Austin, 2019.

the relationship these regulations have to the international space law regime and United States policies, and the implications for future regulatory updates.

## I. INTRODUCTION

In June of 2018, the Trump Administration released Space Policy Directive-3 (SPD-3), titled "National Space Traffic Management Policy."[1] This Directive was a detailed document, providing guidance and direction for several federal agencies involved in the matter of securing the continued use and enjoyment of the outer space environment. The purpose of the policy was to further evolve extant Space Traffic Management (STM) policy, along with the related field of Space Situational Awareness (SSA), both of which will form the basis for future operations in U.S space activities.[2] The scope and depth of federal responsibility for improving these fields are expanded in SPD-3, with several federal agencies, departments, and their heads being drafted into revitalizing procedures for information gathering, inter-agency cooperation, and revision of extant policies and regulations.[3] Chief among the threats assessed by this policy is orbital debris —useless material traveling at extreme speeds and orbiting the Earth that could potentially collide with functioning technology, or even astronauts, in space.[4] The new policy in SPD-3 aims to control and contain this threat, which poses dangers not only to the national economy, but also to national security and the ability to use and explore space more generally.[5]

Separate from, yet related to the STM concerns expressed during the Trump Administration, is the regulatory mission of the Federal Communications Commission (FCC). The FCC has several tasks to perform in many arenas of public and private life, among these, the responsibility to serve the public good when considering whether to license satellites launched into outer space. The FCC "regulates interstate and international communications by radio, television, wire, satellite and cable in all 50 states, the District of Columbia and U.S. territories,"[6] which in its view, gives it the purview to require orbital debris management plans for space objects launched from or on the behalf of the United States. The FCC has longstanding regulations in place governing communication on space stations, including satellites. Given the need for most such satellites to utilize radiocommunication in order to properly function, the FCC's topical authority is clear.[7]

---

1. National Space Traffic Management Policy, 83 Fed. Reg. 28,969 (June 18, 2018).
2. *Id*. at 28,969.
3. *Id*. at 28,974.
4. *Id*. at 28,970.
5. *Id*. at 28,969.
6. *What We Do*, FCC, https://www.fcc.gov/about-fcc/what-we-do (last visited Apr. 16, 2021).
7. Mitigation of Orbital Debris, 19 FCC Rcd. 11,567, 11,575 (June 21, 2004) (observing that robotic spacecraft are typically controlled through radiocommunications links, and thus there is a direct connection between the satellite's radiocommunications functions and the physical operations of spacecraft).

The FCC has announced that it is aware of the release and meaning of SPD-3, yet "the Commission's efforts to formulate this NPRM on orbital debris mitigation have been underway for some time, and we believe our proposals may provide a method of elevating these important issues for consideration among federal policymakers and stakeholders."[8] Presently, then, we are seeing the confluence of both Space Policy Directive-3,[9] and new rules and revisions to longstanding FCC orbital debris requirements.

### A. THE DEBRIS PROBLEM

Much has been written about the concern over orbital debris.[10] The detritus of decades of space exploration and use, debris creates an obvious problem for the sustained presence of manmade objects in Earth orbit. The interaction of Earth's gravity with space objects can be leveraged to good effect, as when a satellite is placed into a useable orbit. However, objects placed into space are often designed to have operational lifetimes relatively short compared with their likely orbital lifetimes. This means that many objects may serve their purpose, and then simply exist in their orbits, taking up space that could be used by other objects, unless and until the original object is moved. Some space objects are capable of movement through the use of fuel sources, but this is not true of all. Unfortunately, space objects pose potential dangers to other objects should they ever be damaged or destroyed while in orbit. While the presence of an object in its orbital space beyond its operational lifetime is not in and of itself damaging to Earth or to other States' interests in space, the longer the object stays in space, the more chances that object has to break-up or to be hit by other objects. The object can also break up due to internal problems (*e.g.*, explosion caused by trouble with a fuel reservoir), or interactions with natural debris present in the space environment. Indeed, "each piece of debris involved in a collision produces still more debris."[11] Thus, break-ups create clouds of debris, moving at extreme speeds, that become potential threats to other, functioning objects in the space environment.

Even the smallest pieces of debris are potentially hazardous. Debris approximately ten millimeters in length could penetrate a space object like a

---

8. Mitigation of Orbital Debris in the New Space Age and Mitigation of Orbital Debris, 33 FCC Rcd. 11,352, 11,358 (Nov. 15, 2018); *see also* Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. 4742-01, 4744 (proposed Feb. 19, 2019) (to be codified at 47 C.F.R. pts. 5, 25, and 97).

9. National Space Traffic Management Policy, 83 Fed. Reg. 28,969 (June 18, 2018).

10. *See, e.g.*, Steven A. Mirmina, *Reducing the Proliferation of Orbital Debris: Alternatives to a Legally Binding Instrument*, 99 AM. J. INT'L L. 649, 653-54 (2005); Michael S. Dodge, *The Environmental Regulation of Space Activities: Orbital Debris Mitigation Guidelines—International Treaty v. Voluntarily Adopted National Guidelines*, 2 ASIAN J. AIR & SPACE L. 61 (2012), for a review of the problematic nature of debris.

11. Lawrence D. Roberts, *A Lost Connection: Geostationary Satellite Networks and the International Telecommunication Union*, 15 BERKELEY TECH. L. J. 1095, 1124-25 (2000).

Shuttle, and a mere five millimeters in length could penetrate an astronaut's space suit.[12] Normal space activities contribute to the problem by dint of simply being in space, but unfortunately there are times when States create debris intentionally or at least know they are creating it through anti-satellite weapons tests (ASATs) that can shatter an object into thousands of speeding little threats.[13] In one instance, China created around 5,000 pieces of debris when it intentionally destroyed its Fengyun-1C satellite in 2007 with a missile test.[14] Three years after this event, more than 2,600 objects were being tracked stemming from this ASAT test, and less than one percent had returned to Earth.[15] During the Cold War, both the United States and the USSR engaged in their own ASAT tests, each of which produced their own respective debris.[16] As of the October of 2020, the United States Space Surveillance Network was tracking 21,293 objects in space, most of which are debris.[17]

Given the threat to the peaceful and continued uses of space posed by orbital debris, many states have acted to mitigate the creation of new problems. There are domestic mitigation regimes, such as several policies the United States has put in place respecting its space activities. There are also international attempts at preventing harm, such as the Inter-Agency Debris Coordination Committee Guidelines (IADC), discussed further below. Ultimately, current legal solutions to the debris problem at an international level are scattershot and dependent on Cold War-era treaties whose primary purposes were to maintain peace and stability—not to maintain an orderly space environment. Some states have adopted domestic laws and policies to assess what can be done locally to prevent unnecessary breakups in space, or to otherwise ameliorate the hazards of persistent space objects in orbits around the Earth.

### B. SHIFTING STANDARDS IN THE UNITED STATES

The United States Government presently operates to prevent new sources of orbital debris through a variety of means. Predominant among

12. Mirmina, *supra* note 10, at 650.

13. Roberts, *supra* note 11, at 1124-25.

14. *Orbital Debris Quarterly News*, NASA 7 (Jan. 2010), https://orbitaldebris.jsc.nasa.gov/quarterly-news/pdfs/odqnv14i1.pdf.

15. *Id.*

16. Dodge, *supra* note 10, at 66.

17. *Orbital Debris Quarterly News*, NASA 12 (Nov. 2020), https://orbitaldebris.jsc.nasa.gov/quarterly-news/pdfs/odqnv24i4.pdf.

these are the U.S. Government Orbital Debris Mitigation Standard Practices.[18] These practices are primarily intended to apply to U.S.-operated or sponsored space activities, such as when NASA launches a planetary probe, or sends its personnel to the International Space Station through a government spacecraft.[19] The National Oceanic and Atmospheric Administration analyzes the potential for debris creation during its licensing process,[20] as does the FCC.[21] These processes will continue to be linked to the new STM efforts promoted by SPD-3.

SPD-3 specifically orders the Administrator of NASA to work with several relevant federal agencies, including the FCC, to update and evolve the U.S. Orbital Debris Mitigation Standard Practices,[22] which most recently happened in 2019. Specifically, the policy mandates that the Chairman work with other relevant federal heads in order to develop best practices and standards for space traffic,[23] prevent radio interference with space assets,[24] and ensure compliance with international treaty obligations, most prominently the Registration Convention.[25]

The year 2018 proved to be significant for STM, which saw both SPD-3 issued and independent FCC hearings and rulemaking on orbital debris undertaken for the first time in more than a decade. The full impacts of SPD-3 will take time to understand, both on space traffic management generally, and the particular regulations emerging from renewed FCC focus on the matter. Given the release of the Notice of Proposed Rulemaking (NPRM) to the Federal Register on February 19th, 2019, and that it was open to commentary until April 5th, 2019, with responses due on May 6th, multiple comments were received regarding the potential impacts of the Proposed Rule, many of which were received from industry and commercial providers concerned with

---

18. *Orbital Debris Mitigation Standard Practices*, U.S. GOV'T (Nov. 2019), https://orbitaldebris.jsc.nasa.gov/library/usg_orbital_debris_mitigation_standard_practices_november_2019.pdf [hereinafter *U.S. Mitigation Practices*].

19. *Id.* at 1. "The USG will follow the ODMSP, consistent with mission requirements and cost effectiveness, in the procurement and operation of spacecraft, launch services, and the conduct of tests and experiments in space." *Id.* This statement could also be read to suggest the Practices would potentially apply to commercial operators with whom NASA plans to do business, which expands their utility beyond that of the USG alone.

20. *See About the Licensing of Private Remote Sensing Space Systems*, N.O.A.A., https://www.nesdis.noaa.gov/CRSRA/licenseHome.html (last visited Apr. 18, 2021).

21. *See generally* Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. 4742-01 (proposed Feb. 19, 2019) (to be codified at 47 C.F.R. pts. 5, 25, and 97).

22. National Space Traffic Management Policy, 83 Fed. Reg. 28,969, 28,974 (June 18, 2018).

23. *Id.* at 28,975.

24. *Id.*

25. Convention on Registration of Objects Launched into Outer Space (Registration Convention), 28 U.S.T. 695, 1023 U.N.T.S. 15.

how new regulation might impact their dealings.[26] At this stage in the process, there was a clear direction towards greater reporting on and assessment of orbital debris plans for license applicants, along with stronger efforts at preventative measures designed to take advantage of knowledge of how debris is generated and propagated. The Final Rule issued in 2020 addressed some of these concerns, and left room for improvement through future rulemaking.

It is safe to conclude that the last several years have seen significant policy development for space activities coming from the executive branch, and that more efforts are underway. In analyzing the nature and extent of the FCC's growing role in space traffic management, this article hopes to highlight three key findings stemming from SPD-3 and FCC regulations. Firstly, the efforts of the FCC to stem the creation and proliferation of orbital debris is central to the White House's view of the FCC's place in a renewed space traffic management regime. Secondly, the fifteen years that have elapsed between the extant rules and the new Proposed Rule, as well as the rapidly expanding market for constellations of satellites requiring FCC licensure, have taught the FCC that refreshed rules must take the experience of other agencies and the best practices of advisory groups into consideration for future work. Finally, even after the release of the Final Rule, the FCC is engaged in something of an administrative soul-searching regarding its proper function in the greater STM scheme going forward. Each of these findings has, and will continue to have, substantial influence on STM and SSA.

## II. BACKDROP OF INTERNATIONAL LAW

The FCC's proposed rules have a distinctly national flare about them. They are, after all, designed to modify standards for entities licensing their satellites out of the United States, or to control entities conducting business with such technologies within the jurisdictional ambit of U.S. regulatory process. However, the impetus for creating such regulations can be traced back to international obligations under the Outer Space Treaty (OST).[27] While the OST has no specific guidance on either STM or orbital debris, it can be generally interpreted as requiring States-Parties to conduct their exploration and use of outer space so as to not interfere with the peaceful activities of other States in space, including through the creation or accretion of environmental

26. *See Electronic Comment Filing System*, FCC, https://www.fcc.gov/ecfs/search-proceedings (search in "Specify Proceeding" search bar for "18-313"; then click "Comment" hyperlink under "Top Filing Types" sidebar) (last visited May 12, 2021).

27. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and other Celestial Bodies, art. IV, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

waste that causes or could become hazards. Articles important to the maintenance of safe usage of space include Article I (with its emphasis on open access to space), Article III (exporting international law to the space environs), and Article IX (providing for environmental protections in space and on Earth, and enabling consultations between States regarding their activities in space).

Of these, Article IX is the most obvious international reason to set up domestic rules preventing the creation of orbital debris. With its emphasis on treating other States with "due regard," and on preventing the "harmful contamination" of space, every State-Party to the OST is implicitly tasked with setting up some kind of system to accomplish their international obligations.[28] While the meaning of the somewhat mysterious term "harmful contamination" remains, for legal purposes, obscure, one can nevertheless see the FCC marching towards some kind of preventative effort that could, ostensibly, help to prevent this damage. The OST does not specify how this must be done, which gives States several options to ensure compliance. In the United States, several federal entities work to prevent the creation of debris in space, or to mitigate the presence of current debris. The FCC is one of these entities, although one could argue that this task is better suited to other agencies.[29] In any event, as with the FCC's insistence that its rules help to fulfill the Registration Convention, arguably they also will serve, if designed properly, to uphold obligations under Article IX of the OST.

Article VIII of the OST is also germane to the debris problem. This article establishes the continuity of ownership for objects in outer space, even though while in space itself, they are in a 'sovereign-less' zone.[30] Specifically, it states that "ownership of objects launched into outer space . . . is not affected by their presence in outer space or on a celestial body or by their return to Earth"[31] This means that removal of debris is a complex topic, from both a technical and legal standpoint. While some companies have proposed debris removal as (what they believe to be) a viable business plan,[32] the OST does not allow one State to remove the debris generated by another State, as such would infringe on the ownership principle established in Article VIII.[33] For example, if a British company proposes using active debris removal

28. *Id*. at art. IX.

29. *See infra* Part VIII.

30. Outer Space Treaty, *supra* note 27, at art. VIII.

31. *Id*.

32. *See*, *e.g*., Debra Warner, *Astroscale, ClearSpace Aim to Make a Bundle Removing Debris*, SPACE NEWS (Oct. 11, 2019), https://spacenews.com/astroscale-clearspace-aim-to-make-a-bundle-removing-debris/.

33. Outer Space Treaty, *supra* note 27, at art. VIII.

(ADR) technology to scoop up debris from China's destroyed FY-1C spacecraft, they would, in theory, be blocked by Article VIII from doing so without the prior permission of China. The scenario is not unlike State A finding State B's ocean liner adrift in the middle of the Pacific—State A cannot simply take the vessel for itself, claiming that it poses a hazard to navigation on the high seas, as it would be commandeering another State's property. If State B's vessel had properly been 'abandoned,' then salvage laws might come in to play, but currently in outer space there are no such laws. It is impossible to abandon State property in outer space under current law, unless and until modifications are made to the Outer Space Treaty to permit such, or if, somehow, customary practices were to develop over time permitting salvage.

Perhaps anticipating this challenge, the 2020 United States National Space Policy made allowances for future international cooperation on developing means to combat the proliferation of orbital debris.[34] Specifically, the Policy calls for the United States to "[e]valuate and pursue, in coordination with allies and partners, active debris removal as a potential long-term approach to ensure the safety of flight in key orbital regimes."[35] The focus here is on developing diplomatic approaches to use ADR, which will include negotiation on what debris gets removed, from where in the orbit, and by whom.[36] This acknowledges the futility of pursuing ADR unilaterally, and promotes, for the first time at the U.S. Government level, international cooperative activities in space towards preserving the space environment with active, rather than simply preventative, measures. Combined with the recent U.S. Government decision to generate, share, and improve upon SSA data globally (discussed *infra*), these measures recognize that efforts to control the uncontrolled proliferation of debris must rely upon a two-pronged approach: 1) prevention and mitigation, on the one hand, and 2) active removal measures on the other.

## III. DOMESTIC (U.S.) POLICY AND REGULATORY INFLUENCES

In adopting new debris rules, the FCC was hardly working in the dark. While some within the FCC question the proper nature of interfacing with and enforcing debris standards, it has been in this position before with the orbital debris rules it adopted in 2004.[37] Then, as now, the FCC can and has relied on several available documents and standards to develop its own rules. The following section briefly describes several of these, and how they can—

34. The National Space Policy, 85 Fed. Reg. 81,755, 81,762 (Dec. 9, 2020).
35. *Id*. at 81,762.
36. *Id*.
37. Mitigation of Orbital Debris, 19 FCC Rcd. 11,567, 11,575 (June 21, 2004).

and do—impact the current discussion between the FCC and the general public.

### A. U.S. NATIONAL SPACE POLICY

Until December 2020, President Obama's 2010 National Space Policy operated as the foundational guidance for numerous federal efforts at securing, using, and protecting the space environment.[38] It speaks to the clear value of outer space, the necessity of its continued use, and that threats—including to the space environment—cannot be ignored. President Obama's opening statement for the Policy mentioned the "decades of space activity [that] have littered the Earth's orbit with debris,"[39] and noted the United States is up to the challenge this poses. Further, the Policy proposed to continue strengthening the stability of the outer space environment, which included creating tougher measures with which to address orbital debris.[40] Additional efforts to preserve the value of the space environment were described in the Policy, but most of note here is the requirement that heads of U.S. agencies would need to approve any exceptions to the U.S. Government Orbital Debris Mitigation Standard Practices.[41]

Towards the end of his term in office, President Trump issued a new U.S. National Space Policy.[42] The 2020 Policy is in line with the prior administration's priorities for the space environment, though it amped up the expectations. While the previous Policy focused on continuing practices like following the U.S. Government's Orbital Debris Mitigation Standard Practices, the new Policy made note that this Policy will not only be followed, but updated periodically, setting the stage for continued evolution of best practices standards by the U.S. Government.[43] Given that the new National Space Policy mandates following these Practices, and that they are expected to change, presumably more rapidly now than in the past, it behooves space launch planners to maintain familiarity with the Standard Practices even more diligently than in prior years. Further, the new Policy aligns with the past one in requiring exceptions to the Practices to be run by the head of the relevant agency that sponsors the launch, and to inform the Secretary of State.[44] The new Pol-

---

38. *National Space Policy of the United States of America*, OBAMA WHITE HOUSE (June 28, 2010), https://obamawhitehouse.archives.gov/sites/default/files/national_space_policy_6-28-10.pdf [hereinafter NSP 2010].

39. *Id*. at 2.

40. *Id*. at 4.

41. *Id*. at 8.

42. The National Space Policy, 85 Fed. Reg. 81,755, 81,755-73 (Dec. 9, 2020).

43. *Id*. at 81,761.

44. *Id*. at 81,762.

icy also places emphasis on sharing relevant data for space situational awareness (SSA), which could assist states around the globe in planning their space activities in such a way to help prevent collisions between space objects.[45] Sharing such data will be challenging for a variety of legal and logistical reasons, and concerns over interaction with other national security laws (such as the International Traffic in Arms Regulations, which restrict sharing certain kinds of data internationally) will need to be addressed before full and effective sharing schemes are established.

### B. U.S. GOVERNMENT ORBITAL DEBRIS MITIGATION STANDARD PRACTICES[46]

In 1997, NASA and other partners developed what would become the primary practices document to be used by all federal agencies, beginning in 2001, in their use of space, and these in turn were openly shared with industry in the hopes of encouraging best practices by public and private actors alike.[47] The 2001 Practices contained four objectives: 1) any space programs will assess how likely they are to create debris in their normal operations, and seek to limit debris creation; 2) programs will assess the likeliness of explosions for space operations—including after the mission is complete—and attempt to reduce the possibility of such an explosion happening; 3) programs will work to ensure their space objects do not collide with other man-made objects, or with natural debris from objects like micrometeoroids; 4) and that missions will make efforts to find cost-effective processes to minimize the impact of current programs on future missions.[48] Each of these objectives contain explanatory sections that delineate programmatic behaviors to ensure success, though they are arguably flexible enough to allow reasonable deviation when expense or unique mission profiles allow.

The 2019 update to the standards is spiritually the same as its older sibling. The standard seeks to mitigate the creation of new orbital debris by incrementally, yet substantially, altering the mold of the 2001 rules to include numerical objectives.[49] The preambular material to the 2019 standard notes that "the improvements consist of a quantitative limit on debris released during normal operations, a probability limit on accidental explosions, probability limits on accidental collisions with large and small debris, and a reliability

45. *Id.*

46. *U.S. Mitigation Practices*, *supra* note 18.

47. *Debris Mitigation*, NASA ORBITAL DEBRIS PROGRAM OFF., https://orbitaldebris.jsc.nasa.gov/mitigation/ (last visited Apr. 18, 2021).

48. *Orbital Debris Mitigation Standard Practices*, U.S. GOV'T (2001), https://www.orbitaldebris.jsc.nasa.gov/library/usg_od_standard_practices.pdf.

49. *U.S. Mitigation Practices*, *supra* note 18, at 2-8.

threshold for successful postmission disposal."[50] For example, where the 2001 Practices referred to reducing the risk to one space system from another (due to explosion) using any appropriate standard, the 2019 Practices specify analyses should use methods commonly used in engineering or probability assessment, and that the risk of debris-causing events through explosion should be less than 0.001 for both deployment and mission operation timeframes.[51] Similarly, possible collisions with large objects in orbit was required to be limited in the 2001 standards, but now these limitations have been specified to include the size of objects anticipated (10 cm or greater) over the lifetime of the object (which is now 100 years), with the standard for collision again being 0.001 (or 1 in 1,000).[52]

Curiously, there is no specification as to how these numbers were developed, or whether they represent the best possible outcome for the reduction in debris creation events. The United States Government must weigh the balance between its needs, and the overarching health of the outer space environment, so these new Practices may align with policymakers' views on what best accommodates these pressures. Whether or not these new standards possess the necessary teeth to keep U.S. Government space operations in line with best practices for debris mitigation remains to be seen; however, the new standards are subject to future reviews that may shift the numbers in whichever direction deemed needed to achieve governmental objectives in space, consistent with domestic and international environmental obligations.

### C. NASA TECHNICAL STANDARD

NASA has adopted an extensive policy in order to fulfill NASA Procedural Requirement 8715.6, the NASA Procedural Requirements for Limiting Orbital Debris.[53] The standard's weighty procedures are used in conjunction with NASA missions, and give that administration specific instructions that, in theory, will reduce the creation of new debris due to NASA's missions. It notes that "[o]rbital debris assessments are required to be used for all payloads, launch vehicle orbital stages, and released objects."[54] Importantly, NASA views this document to be consistent with, and in furtherance of, the National Space Policy, the Inter-Agency Debris Coordination Committee

---

50. *Id*. at 1.

51. *Id*. at 3.

52. *Id*. at 4.

53. *NASA Procedural Requirements for Limiting Orbital Debris and Evaluating the Meteoroid and Orbital Debris Environments*, NASA (Feb. 16, 2017), https://www.orbitaldebris.jsc.nasa.gov/library/npr_8715_006b_.pdf.

54. *NASA Technical Standard: Process for Limiting Orbital Debris*, NASA 5 (Apr. 25, 2019), https://standards.nasa.gov/standard/nasa/nasa-std-871914 (click "Download nasa-std-8719.14b" hyperlink to access the pdf) [hereinafter *NASA Technical Standard*].

(IADC) Guidelines, and the U.S. Government Standard Practices,[55] which demonstrates the interconnected nature of both domestic and international debris policies.

### D. INTER-AGENCY DEBRIS COORDINATION COMMITTEE (IADC) GUIDELINES[56]

The IADC Guidelines set forth an international effort to combat debris creation, and they mirror several efforts from the United States and other individual states.[57] They are representative of the best practices recommended by several state space agencies, including NASA, JAXA, ROSCOSMOS, CNES,[58] and others.[59] While the guidance contained within the document is less dense than the NASA Technical Standard, the spirit remains the same—work towards eliminating new sources of debris, in order to preserve the future utility of the space environment for all states.[60]

### E. SPACE POLICY DIRECTIVE-3[61]

Perhaps the greatest impetus for modifying the former FCC Orbital Debris Order (2004) comes from the actions of the Trump White House. In the SPD-3, President Trump ordered a large-scale review and evolution of space traffic management strategy and policy.[62] After generally describing the ways in which using the space environment benefits the United States economically, scientifically, and in defense, the Directive calls for revisions to current procedures.[63] The long-used U.S. Government Standard Practices are now "inadequate to control the growth of orbital debris. These standard practices should be updated to address current and future space operating environments."[64] Specifically, the FCC is tasked with assisting in the renovation

---

55. *Id*.

56. *IADC Space Debris Mitigation Guidelines*, INTER-AGENCY SPACE DEBRIS COORDINATION COMM. (Sept. 2007), http://www.unoosa.org/documents/pdf/spacelaw/sd/IADC-2002-01-IADC-Space_Debris-Guidelines-Revision1.pdf [hereinafter *IADC Guidelines*].

57. *Id*. at 5-9.

58. These agencies represent major space-faring states, including: U.S.A., National Aeronautics and Space Administration (NASA); France, Centre National d'études Spatialis (CNES); Japan, Japanese Aerospace Exploration Agency (JAXA); and Russian Federation, Roscosmos State Corporation for Space Activities (ROSCOSMOS).

59. *IADC Guidelines*, *supra* note 56, at 3.

60. *Id*. at 4.

61. National Space Traffic Management Policy, 83 Fed. Reg. 28,969, 28,969-76 (June 18, 2018).

62. *Id*. at 28,969-71.

63. *Id*. at 28,970.

64. *Id*. at 28,972.

of U.S. efforts in the field of space debris management, along with other relevant agencies.[65] Part of this requires an inter-agency effort, of which the FCC is a member, to create better technical standards, safety practices, behavioral norms, and standards for the prevention of on-orbit collisions.[66]

These are some of the primary tools the FCC had in its possession when redesigning its new Proposed Rule. It can, at least in part, explain repeated references in the NPRM to the expertise of other agencies, including (and especially) NASA. For instance, when seeking input from the public regarding the safety of flight profiles, the FCC spoke of the probability of collisions between objects within the Low-Earth Orbit (LEO) region, referencing the relationship between energy and orbit of an object via NASA's Technical Standard.[67]

## IV. PROPOSED RULES: MITIGATION OF ORBITAL DEBRIS IN THE NEW SPACE AGE

Prior to the release of the Proposed Rule in early 2019, the FCC drafted and adopted a report, FCC 18-159, explaining its views on the necessity of reexamining the older rules.[68] The report also announced the proposed rules it intended to supply to the Federal Register for notice and comment from the public.[69] The FCC's justifications for coming back to the topic after more than a decade ranged from the proliferation of objects in space, to the potential damage to the sizeable space economy from errant debris, to the harm to the health and safety of people on Earth.[70] Further, Commissioner Rosenworcel noted that "after more than a year of work, we now have an update to the United States Government Orbital Debris Mitigation Standard Practices, thanks to an interagency process led by NASA and required by Space Policy Directive-3,"[71] and that this helped to push forward the FCC's decision to initiate regulatory changes. In reexamining its rules for orbital debris, the FCC demonstrated that: 1) it is willing, able, and motivated to provide additional rigor and breadth to the existing rules; and 2) that it both desires and needs input from the public to effectively do so. The Proposed Rule looked

---

65. *Id*. at 28,974.

66. *Id*. at 28,975.

67. Mitigation of Orbital Debris in the New Space Age and Mitigation of Orbital Debris, 33 FCC Rcd. 11,352, 11,358 (Nov. 15, 2018); *see also* Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. 4742-01, 4744 (proposed Feb. 19, 2019) (to be codified at 47 C.F.R. pts. 5, 25, and 97).

68. Mitigation of Orbital Debris in the New Space Age and Mitigation of Orbital Debris, 33 FCC Rcd. at 11,354.

69. *See generally id*.

70. *Id*. at 11,353-55.

71. Mitigation of Orbital Debris in the New Space Age, 35 FCC Rcd. 4156, 4291 (Apr. 24, 2020) (Concurring Statement of Commissioner Jessica Rosenworcel).

structurally ready to implement, yet it was replete with dozens of questions and calls for responses to its new (potential) regulations.[72] This decision was by design, as it gave operators the ability to see how new regulation would appear, formatted in familiar ways, yet gave opportunity to generate informed feedback.

Some of these solicitations concerned particular parties (*e.g.*, private satellite operators, amateur operators, etc.). For instance, "the Commission seeks comment on the suitability of various orbital debris mitigation guidance and standards for application to non-Federal satellite systems."[73] Others concerned basic questions of added numerical details for risk assessments (*e.g.*, whether percentages ought to be attached to certain kinds of behaviors or objects that could generate additional debris).

Importantly, in its request for comments, the FCC appeared particularly concerned with the presence and expansion of constellations of satellites. Indeed, "[p]roposed deployments of large satellite constellations in the intensely used LEO region . . . will have the potential to increase the risk of debris-generating events."[74] In several places, it sought comments on whether more stringent controls need to be placed on such systems, and in what manner.[75] For instance, when addressing the safety of flight profiles:

> We seek comment on whether, if a spacecraft's orbital debris mitigation plan includes maneuvering to avoid collisions, [the Commission] should, consistent with current licensing practice, consider the risk to be zero . . .The NASA Standard applies the 0.001 metric on a per-spacecraft basis. We invite comment on whether this metric should also be applied on an aggregate, system-wide basis, *i.e.*, 0.001 for an entire constellation.[76]

Other commentary on constellations, and their impact on the debris potential, appear on no fewer than ten pages of the NPRM. Clearly, large-scale operations weighed heavily on the minds of the Commissioners.

Taken as a whole, and far from flailing about looking for its raison d'être in governmental debris management policy, the sea of questions presented in the NPRM indicate the seriousness with which the FCC is taking its mandate. The extent of its probing serves the concerns of Commissioners who felt that more information was needed, especially concerning the issue of expertise.[77]

---

72. *See generally* Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. 4742-01.

73. Mitigation of Orbital Debris in the New Space Age and Mitigation of Orbital Debris, 33 FCC Rcd. at 11,358.

74. *Id.* at 11,357.

75. *Id.* at 11,369.

76. *Id.* at 11,361-62 (emphasis omitted).

77. *See id.* at 11,415 (Statement of Commissioner Brendan Carr).

Given the importance attached to the issue by the FCC's statements in FCC 18-159, the questions posed served as a rich vein of policy and technical wisdom from which the Final Rule was crafted. Though not all changes the FCC proposed were adopted, it seems evident that they made clear their reasoning for stricter rules in its draft of the Proposed Rule. From this, the FCC is certainly moving regulation on the matter of *debris*—whether forwards or otherwise remains open to debate and subject to various perspectives, although FCC 18-159 is clear that waiting to address the perceived problem was not an option, especially in light of continuous and increasing use of the orbital environment.

The domestic pressures to revise regulations are one of the factors that drove the NPRM. However, another reason for the reconsideration of the earlier rules is conformity with international law and policy. The FCC referenced both the sustainability guidelines of the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS)[78] and the IADC Mitigation Guidelines[79] as critical to its work.[80] Redrafting licensing requirements and standards to accord with those documents reflects the international level of concern involved, whilst simultaneously serving the spirit of the National Space Policy and subsequent executive guidance.

## V. INFORMATIONAL AND OPERATIONAL NORMS

The FCC's new Rule focuses predominantly on two methods of combating orbital debris: firstly, disclosure of germane information in the form of reporting by applicants for licensure.[81] Secondly, the FCC is recommending operational procedures to enhance safety of operations for satellites and space objects used to deploy them.[82] The Proposed Rule both modifies and adds to the current rule in several key ways, each of which are designed to fulfill the FCC's goals of serving the public interest.[83]

In one informational evolution, the FCC has revised requirements involving the assessment of and planning for the release of debris during natural operations of satellites. Prior to the NPRM, the rule required the satellite operator to assess and minimize the possibility of the release of new sources of debris.[84] However, this did not include a requirement to assess whether

78. UN COPUOS Sustainability Guidelines, UN Document A/AC.105/L.315 (2018).

79. *IADC Guidelines*, *supra* note 56.

80. Mitigation of Orbital Debris in the New Space Age and Mitigation of Orbital Debris, 33 FCC Rcd. at 11,355.

81. Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. 4742-01, 4743 (proposed Feb. 19, 2019) (to be codified at 47 C.F.R. pts. 5, 25, and 97).

82. *Id.*

83. *Id.*

84. 47 C.F.R. § 25.114(d)(14)(i) (prior to the amendments of Aug. 25, 2020).

any deployment devices, *i.e.*, devices launched into space that then release satellites into orbit, are to be used, nor did it require operators to justify why they chose to use any unorthodox methods in deployment. The Proposed Rule rectifies this by requiring a "statement [that] must include an orbital debris mitigation disclosure for any separate deployment devices not part of the space station launch that may become a source of orbital debris."[85] This is required in several parts of the new rule,[86] and ostensibly would serve to require justifying[87] the use of materials that could enhance the creation of new debris.

Likewise, the original rule did not account for the possibility that liquids could themselves, once outside of their spacecraft, become sources of debris. The Proposed Rule requires "a statement that the space station operator has assessed and limited the probability of accidental explosions or release of liquids that could become debris during and after completion of mission operations."[88]

Another change requires more information about safety of flight profiles. For instance, curiously, current rules require an assessment of the probability of collision in space, but do not require a specific probability estimation to be provided; *i.e.*, no numeric value need be applied to the probability.[89] In contrast, the NPRM requires a metric to be adopted that is derived from the NASA Standard, specifically that "the probability that their spacecraft will collide with a large object during the orbital lifetime of the spacecraft will be no greater than 0.001."[90]

Some of the proposed operational requirements include requiring that stations planned for operation in the 650-2,000 km range be deployed below the 650 km mark, and then maneuvered into the proper position.[91] The reasoning behind this being that objects in low Earth orbit are thought to generally fall back to the Earth within a 25-year period when not corrected or maintained, which limits their risk as potential objects for collision.

There are several other significant changes, but one that deserves particular attention is the notion of operator insurance, and the concept of indemnifying the government. The prior debris order declined to adopt a rule requiring space station operators to obtain insurance to protect the United

85. Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. at 4754.

86. *Id.* at 4755.

87. Mitigation of Orbital Debris in the New Space Age and Mitigation of Orbital Debris, 33 FCC Rcd. 11,352, 11,362 (Nov. 15, 2018).

88. Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. at 4754.

89. 47 C.F.R. § 25.114(d)(14)(iii) (prior to the amendments of Aug. 25, 2020).

90. Mitigation of Orbital Debris in the New Space Age and Mitigation of Orbital Debris, 33 FCC Rcd. at 11,361.

91. Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. at 4756.

States from exposure to liability claims arising from orbital debris, but stated insurance and liability issues will continue to play a role in the determination of whether approval of a particular debris mitigation plan serves the public interest.[92]

In contrast, the Proposed Rule requires that, "[a]s a condition of their licenses for experimental satellite facilities, licensees must submit an executed agreement indemnifying the United States against any costs associated with a claim brought against the United States related to the authorized facilities."[93] Such an indemnification requirement is a strong step in recognizing the damage that can occur not only to the physical environment of space, but also clarifies the role played by the United States Government regarding liability.

Given these changes, the Proposed Rule differs most substantially from the 2004 Rule in its expansive, if occasionally confused,[94] efforts to comply with SPD-3's mandates while also updating its own regulations with new informational and operational tasks, all of which are designed to address the overarching problem of debris generation. Further, while these efforts clearly do not directly address Space Policy Directive-3's very specific command to renovate the U.S. Government Orbital Debris Standard Practices, they can be seen as a step in the direction of creating new "guidelines for satellite design and operation[.]"[95] With the SPD-3 contemplating the incorporation of new standards into licensing regimes for the various agencies involved in space operations,[96] the FCC's efforts in revising its own processes independently of a new set of U.S. Standard Practices indicates an effort to get ahead of the inter-agency game, and to continue propounding appropriate rules as it sees fit under its current regulatory mandate.

## VI. VIEWS OF INDUSTRY, ACADEMIA, AND INTERNATIONAL ENTITIES

After the FCC's NPRM opened for comments, a host of industry representatives, academics, and international concerns submitted comments to the FCC's docket IB 18-313, where they were collected for public dissemination and review.[97] With more than eighty comments, letters, and *ex parte* filings, the proposed rules attracted quite an audience. Many of these filings indicated

---

92. Mitigation of Orbital Debris, 19 FCC Rcd. 11,567, 11,612-14 (June 21, 2004).

93. Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. at 4754.

94. The FCC's debris platform is not being questioned here, so much so is its self-imposed questioning of the propriety of a communications agency tasked with the development of debris standards.

95. National Space Traffic Management Policy, 83 Fed. Reg. 28,969, 28,974 (June 18, 2018).

96. *Id.*

97. *See Electronic Comment Filing System*, *supra* note 26.

the general interest in clearing up some of the proposed rules. Some of the standards, if enacted, could cause confusion without further explication. Additionally, both domestic and international parties doing business in the U.S. demonstrated their keen interest in the disposition of the rules, in part to protect their own needs, and in part to express concerns over how the rules would be implemented.

A smattering of comments came from some of the usual suspects, given their clear and continuing interest in space activities. Groups like SpaceX, the Boeing Company, Eutelsat S.A., Telesat Canada, Sirius XM Radio Inc., AT&T Services, Inc., the U.S. Department of Commerce, and other private actors and academic groups expressed their views.[98] SpaceX was particularly vocal in objecting to the notion of creating rules to manage debris that were based on aggregations of satellites, rather than applicable on a per satellite basis.[99] It argued that the new rules ought to be applied equally to each individual satellite, and that the focus should be on rules that do not allow less scrupulous companies to move in order to have their licenses provided by states outside of the U.S., as this could allow for a kind of forum shopping to locate less strict legal regimes.[100]

Likewise, Boeing noted that "it is inherently global in scope . . . absent such consensus, any rules adopted by the Commission will become obstacles to U.S. industry and further encourage space entrepreneurs to base their operations and efforts overseas."[101] Boeing was also concerned that the failure to demonstrate the efficacy of some of the proposed rules limiting debris by certain percentages would be harmful to new entrants to the field, until their necessity could be demonstrated.[102] Many other comments sent to the FCC carried similar messages, or exhortations to reconsider the rules as planned.

## VII. THE FINAL RULE

The FCC's Final Rule was released in April of 2020, and it came into effect on August 25th of the same year.[103] These rules utilized lessons learned in the NPRM process to create a set of rules that the commissioners, on the whole, thought would address most of their debris concerns for the short-to-mid-term. Other, more substantial recommendations, such as a tightening of

98. *See id*.

99. *See* SpaceX, Reply Comments on Proposed Rule on Mitigation of Orbital Debris in the New Space Age (May 6, 2019).

100. *See id*.

101. *See* Boeing Company, Reply Comments on Proposed Rule on Mitigation of Orbital Debris in the New Space Age (May 6, 2019), at ii.

102. *Id*. at iii.

103. Mitigation of Orbital Debris in the New Space Age, 85 Fed. Reg. 52,422-01 (Aug. 25, 2020) (to be codified at 47 C.F.R. pts. 5, 25, 97).

the 25 years on-orbit rule for space objects, were left to future rulemakings. Of note, the new Rule brings large object collision and casualty risk standards substantially in line with other federal agencies, such as NOAA, NASA, and the FAA.[104] The commissioners also adopted many of their proposed rules from the NPRM, though they altered some subsequent to comments received from individual commenters, industry representatives, and other federal agencies.

The Final Rule adopted the 0.001 collision avoidance rule, providing for one chance in a thousand for collision, over the lifetime of the object.[105] This was one of the FCC's more pressing guidelines in the Proposed Rules for reducing the potential generation of orbital debris. For systems with multiple satellites, the FCC has called for further comments.[106] Since much of the concern over the proliferation of debris from satellites stems from the notional risk associated with increasing the numbers of satellites in large constellations, it is understandable that the commissioners decided to push their decision on this matter until such time as they may make a more informed choice.

The so-called 25-year rule was also cause for concern to the FCC. Because objects operated at 650 km or greater tend to not return to the Earth within a 25-year period (a standard currently operated by NASA as the maximum desired lifetime for objects on orbit),[107] the Proposed Rule suggested that objects intended to operate in a 650 km range or greater ought to be deployed below this altitude, and then maneuvered into their operational position.[108] Yet, this proposal was opposed by several commenters—including NASA, which maintained this standard would increase complexity with no clear reduction in risk[109]—and so the Final Rule opted not to include this standard.[110] The FCC decided that its other risk mitigation strategies would be sufficient to accommodate their concerns over objects at 650 km or above.[111] With similar reasoning, the FCC backtracked on the Proposed Rule's requirement that operators specify why they wished to launch an ob-

104. *Id*. at 52,426-27.

105. *See id*. (discussing how commenters from the Notice of Proposed Rulemaking expressed varying levels of support or confusion regarding the standard for collision avoidance); 47 C.F.R. § 25.114(d)(14)(iv)(A)(1) (2021).

106. Mitigation of Orbital Debris in the New Space Age, 35 FCC Rcd. 4156, 4172 (Apr. 24, 2020).

107. *NASA Technical Standard*, *supra* note 54, at 41 (Requirement 4.6.2).

108. Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. 4742-01, 4746 (proposed Feb. 19, 2019) (to be codified at 47 C.F.R. pts. 5, 25, 97).

109. Mitigation of Orbital Debris in the New Space Age, 85 Fed. Reg. at 52,438.

110. *Id*.

111. *Id*.

ject at or above 650 km, noting again that the newly adopted Final Rule addresses any concerns through collision avoidance and post-mission disposal requirements.[112]

The Proposed Rule's emphasis on specifying sources of liquid that could themselves become debris in space was partially adopted. This standard had the limitation of being somewhat vague, especially since it did not name particular types of liquids, some of which may be more likely than others to become persistent sources of debris. Accordingly, the Final Rule was "clarified to require that applicants must specify only the release of those liquids that may in fact persist in the environment and pose a risk."[113] This refinement still lacks definition as to which liquids this rule may apply, but it does take into account concerns from industry, and moves the regulated objective away from unknown hazards towards known ones.

One of the strictest possible revisions to the old rule was the Proposed Rule's requirements to indemnify the U.S. Government for damage done to it by virtue of satellite operations. This requirement has been removed from the Final Rule and postponed to future regulatory changes at a time when the FCC feels comfortable enhancing the new rules. While an indemnification norm would be a prominent change to older rules, and would provide strong protections to the U.S. Government during a time of private investment and experimental commercial endeavors in non-geostationary orbits, it could also provide barriers to success for businesses seeking to exploit potential opportunities. Commissioner O'Reilly noted that removing this indemnification requirement "is an issue that was appropriately moved to the further notice, joining the post-mission disposal bond proposal. Paying for long-term bonds and determining the uncertain liability of indemnification will greatly increase overall costs, affect financing, and severely disadvantage small businesses, entrepreneurs, and new entrants."[114] Since the FCC intended the Final Rule to strengthen orbital debris prevention, while also avoiding creating hurdles in new opportunities, the current position attempts to satisfy both sides of the regulatory equation, albeit temporarily.

## VIII. EXISTENTIAL COMMUNICATIONS COMMISSION?

With the release of the Final Rule, it is still unclear when the FCC will finish evolving its internal debates on the nature of orbital debris rules. Even before the Final Rule came out, some in the FCC began to question whether

112. *Id.* at 52,429.

113. *Id.* at 52,436.

114. Mitigation of Orbital Debris in the New Space Age, 35 FCC Rcd. 4156, 4289 (Apr. 24, 2020) (Statement of Commissioner Michael O'Reilly).

it is even the appropriate body to address orbital debris. In both the November 2018 report notifying the decision to update their rules, and again in the Proposed Rule, there is evidence of discomfort in a communications branch regulating space traffic management issues. Specifically, Commissioner Carr noted that they are literally dealing with rocket science, and as such, asked, "are we the expert agency to make these assessments? . . . Should the FCC be one of the lead agencies? Should we play a supporting and coordinating role instead?"[115]

Further, and in part to ameliorate Commissioner Carr's concerns, the Proposed Rule's initial data-gathering segment is littered with requests for comment by anyone or any group with something to say on the new rules.[116] Moreover, the Commission asks whether it is even the best group to deal with the matter of orbital debris, or if other agencies would be better suited. It states:

> More broadly, the Commission seeks comment on the appropriate role of the Commission given the various stakeholder agencies and other entities. As discussed above, there are a number of agencies and entities with expertise and interest in mitigating the growth of orbital debris. With various entities playing a role, how does the Commission ensure an appropriate, coordinated approach that avoids duplication of efforts? How can the Commission ensure clarity regarding the roles that various entities can or should play? What agency or entity has the greatest expertise when it comes to the technical, engineering, mathematic, and scientific expertise needed to address orbital debris?[117]

While not directly doubting its own capabilities, the Commission shows no qualms in querying the public for direct thoughts on which agencies ought to handle these issues. As an arm of the White House's efforts on modifying the current STM approach, such solicitations could assist in properly placing the FCC's work in conjunction with those of entities like NASA and the Department of Defense. Further, despite expressing some doubt as to its mandate, the FCC muddled through with its proposal. Given the flexibility suggested in the justification and question sections preceding the actual Proposed Rule, it would not be surprising to see some of the informational and operational rules shift in tone and extent when the Final Rule is released.

---

115. Mitigation of Orbital Debris in the New Space Age and Mitigation of Orbital Debris, 33 FCC Rcd. 11,352, 11,412 (Nov. 15, 2018) (Statement of Commissioner Brendan Carr).

116. Mitigation of Orbital Debris in the New Space Age, 84 Fed. Reg. 4742-01, 4743 (proposed Feb. 19, 2019) (to be codified at 47 C.F.R. pts. 5, 25, and 97).

117. *Id.* at 4752.

In contrast to the questioning posed by her colleagues, Commissioner Rosenworcel is confident in the necessity of the FCC's work to reign in orbital debris.[118] In her concurrence to the decision to propose new rules, she expresses frustration that the FCC is not being forceful enough in tackling the problem.[119] Indeed, "instead of moving forward aggressively—as our draft effort contemplated—we backtrack and add confusing language about whether or not this work should even continue in these halls. This is not the leadership we need as we embark on a new era in space."[120] Commissioner Michael O'Rielly also seems comfortable with the FCC's involvement in the issues, although he finds "some of the reporting proposals somewhat timid, and the preventative ideas may be premature or uncooked . . . ."[121] The comments received from the public for the NPRM suggested the "doneness" of the new regulations will remain a tricky regulatory question for some time.

In the end, it seems clear that despite the internal debate about the legitimacy of the FCC regulating the world of orbital debris, there was sufficient bipartisan support amongst the commissioners to reach a compromise. Chairman Pai even regaled the readership of the FCC report that accompanied the Final Rule with a conversation he had with Chairman Newton Minow, who served in the FCC during President John F. Kennedy's administration.[122] Minow told Pai that "communications satellites are more important than sending a man into space because they will launch ideas, and ideas will last longer than men and women."[123] Coupled with this aspirational foundation for FCC regulations comes a concomitant responsibility to serve both the functions of the FCC in providing communications to the people of the United States, and the duty to be mindful of the outer space environment. Chairman Pai intoned that the recent actions of the FCC in approving several large-scale small-sat constellations for the provision of telecommunications services to customers in the United States meant that the FCC needed to strengthen extant debris rules to keep up with its licensing decisions.[124] If the FCC intends to continue permitting large numbers of small satellites to be launched into low or medium-earth orbits, it is, in essence, setting the stage for potential debris disasters. His sentiments are echoed by Commissioner O'Rielly, who stated "the FCC provides licenses or grants market access for these satellite services, so

118. Mitigation of Orbital Debris in the New Space Age and Mitigation of Orbital Debris, 33 FCC Rcd. at 11,414 (Concurrence of Commissioner Jessica Rosenworcel).

119. *Id*.

120. *Id*.

121. *Id*. at 11,415 (Statement of Commissioner Michael O'Rielly).

122. Mitigation of Orbital Debris in the New Space Age, 35 FCC Rcd. 4156, 4286 (Apr. 24, 2020) (Statement of Chairman Ajit Pai).

123. *Id*. (Statement of Chairman Ajit Pai, quoting former Chairman Newton Minow).

124. *Id*.

we play a role in the good stewardship of space, and, to that end, we must ensure that our rules are up to date."[125] The Final Rule is intended to fulfill these responsibilities.

However, the work of the FCC is far from finished. Stronger rules could have been asserted, but the balance of safety and practicality produced a more modest attempt. Commissioner Rosenworcel had mixed feelings about the work of the FCC in revising old regulation. In her mind, the regulations could have been stronger, and an eye towards the future uses of the space environment should have taken a more pressing role in the outcome.[126] While the other commissioners agreed on the end-state of the Final Rule, Commissioner Rosenworcel merely concurred.[127] The practical result of her concurrence is that the Rule was propounded without real opposition, but it also means in her view that what they produced was necessary, yet flawed. She expressed appreciation that her colleagues were willing to engage in a new notice of proposed rulemaking to seek more input on matters such as strengthening the 25-year on-orbit rule.[128]

## IX. CONCLUDING THOUGHTS

For the United States, the last few years have produced a veritable whirlwind of policy and regulatory changes on space activity. Spurred by Space Policy Directive-3, informed by NASA's expert opinions and commentary from the corporate world, and inspired by updates to the U.S. Government's Orbital Debris Mitigation Standard Practices, the Federal Communication Commission acted to update its own debris prevention rules for the first time in well over a decade. These new rules seek to establish a balance between protecting the space environment for current and future users, and to enable opportunities for private investors looking to exploit the space environment for business opportunities that conform to the FCC's mission. Some of these opportunities are in creating constellations of satellites that could provide internet services to rural or poorly-served areas of the United States, a clear victory, if successful, for both the investors and the FCC. When it began the process of revising its standards, the FCC had almost as many questions as answers regarding how it should proceed. After collecting responses from many interested parties in both the U.S. Government, and from the corporate community, the commissioners developed a Final Rule that strengthens protections against orbital debris, but it also stopped short of introducing several proposed regulations. These were postponed to future rulemakings, to the

125. *Id.* at 4288 (Statement of Commissioner Michael O'Rielly).
126. *Id.* at 4291 (Concurring Statement of Commissioner Jessica Rosenworcel).
127. *Id.*
128. *Id.*

chagrin of some of the commissioners. Yet, the FCC has expressed that it is not finished with its regulatory updates, and has noted it intends to act again once it has more information about how to do so meaningfully. With both internal FCC and external administrative pressures to adapt to the future of orbital debris management, the FCC remains firmly ensconced as a policy and regulatory force in STM.