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New Standards for an Old Problem: the Role of the Federal Communications Commission in Fulfilling Space Policy Directive-3

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The recent Space Policy Directive-3, issued on June 18th, 2018, 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 plays a significant role. Given the FCC's influence on the licensure of satellites and the proliferation of constellations, it will be 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, with an eye towards their revision and in light of its responsibility for increasing traffic in outer space. In November, they released their Notice of Proposed Rulemaking, in which they tackle a multitude of germane topics, from spectrum use to orbital lifetime, and from choice of orbit to post-mission disposal. This essay proposes to examine how the FCC's planned changes will address concerns outlined in SPD-3, and what work remains to be done.

I. Introduction

In June of 2018, President Trump released Space Policy Directive-3. 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. Its focus was on the furtherance of Space Traffic Management (STM) policy, along with the related field of Space Situational Awareness (SSA). 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. Chief among the threats assessed by this policy is orbital debris. The new policy 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.

Separate from yet related to the STM concerns of the current administration is the regulatory mission of the Federal Communications Commission. 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. Given the need for most such satellites to utilize radiocommunication in order to properly function, the FCC’s topical authority is clear.¹ The Commission 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.”² Presently, then, we are seeing the confluence of both Space Policy Directive-3, and proposed rules and revisions to extant FCC orbital debris requirements.

Currently, the United States Government operates to prevent new sources of orbital debris through a variety of means. Predominant among these are the U.S. Government Orbital Debris Mitigation Standard Practices, although the National Oceanic and Atmospheric Administration analyzes the potential for debris creation during its licensing process³, as does the FCC. 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 Federal Communications Commission, to update and evolve the U.S. Orbital Debris Mitigation Standard Practices.⁴ Specifically, the policy mandates that the Chairman work with other relevant federal heads in order to develop best practices and standards for space traffic⁵, prevent radio interference with space assets⁶, and ensure compliance with international treaty obligations—most prominently the Registration Convention.⁷

2018 proved to be a significant year for STM, which saw both SPD-3, and independent FCC hearings and rulemaking. The full impacts of SPD-3 will take time to understand, both on space traffic management generally, and the particular regulations emerging from renewed Commission focus on the matter. Given the release of the NPRM to the Federal Register on February 19th, 2019, and that it is open to commentary until April 5th, 2019 (with responses due on May 6th), much could change beyond that of the Proposed Rule. At this stage in the process, there is 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.

To that end, it is safe to conclude that the last two 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

¹ “The Commission has observed 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.” Mitigation of Orbital Debris, Second Report and Order, 19 FCC Rcd 11567, 11575, para. 14 (2004) (Orbital Debris Order).

² FCC 18-159, at 7 III(13).

³ See NOAA, Spacecraft Disposal and Orbital Debris Mitigation Plan, available at <https://www.nesdis.noaa.gov/CRSRA/licenseHome.html>.

⁴ Space Policy Directive-3, 83 Fed. Reg. 28969 (June 18, 2018), at 6.

⁵ *Id.* at Sec. 6(f).

⁶ *Id.* at Sec. 6(g).

⁷ Convention on Registration of Objects Launched into Outer Space (Registration Convention), 28 U.S.T. 695, 1023 U.N.T.S. 15 (1974).

management, this essay 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 Commission'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, 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. Policy & Regulatory Influences

In adopting new rules, the Commission is hardly working in the dark. While some within the Commission question the proper nature of FCC interfacing with and enforcing debris standards (see below), it has been in this position before, with the orbital debris rules it adopted in 2004.⁸ Then, as now, the Commission could rely on several available documents and standards to ascertain their own rules. The following section briefly describes several of these, and how they can and do impact the current discussion between the FCC and the general public.

- U.S. National Space Policy⁹: The 2010 Space Policy operates as the foundational guidance for numerous federal efforts at securing, using, and protecting the space environs. 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”¹⁰, and notes the United States is up to the challenge this poses. Further, the document proposes to continue strengthening the stability of the outer space environment, which includes creating tougher measures with which to address orbital debris.¹¹ Additional efforts to preserve the value of the space environment are 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.¹²
- U.S. Government Orbital Debris Mitigation Standard Practices¹³: In 1997, NASA and other partners developed what would become the primary practices document to be used by all federal agencies (starting 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

⁸ Mitigation of Orbital Debris, Second Report and Order, 19 FCC Rcd 11567, 11575, para. 14 (2004) (Orbital Debris Order).

⁹ National Space Policy of the United States of America, *available at* https://obamawhitehouse.archives.gov/sites/default/files/national_space_policy_6-28-10.pdf.

¹⁰ *Id.* at 2.

¹¹ *Id.* at 4.

¹² *Id.* at 8.

¹³ U.S. Government Orbital Debris Mitigation Standard Practices, *available at* https://www.iadc-online.org/References/Docu/USG_OD_Standard_Practices.pdf. [Hereinafter U.S. Mitigation Practices.]

private actors alike.¹⁴ The Practices contain 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.¹⁵ 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.

- NASA Technical Standard¹⁶: NASA has adopted an extensive policy in order to fulfil NASA Procedural Requirement 8715.6 (the NASA Procedural Requirements for Limiting Orbital Debris).¹⁷ 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 it “is required to be used for orbital debris assessments for all payloads, launch vehicle orbital stages, and released objects....”¹⁸ Importantly, NASA views this document to be consistent with, and in furtherance of, the National Space Policy, the IADC Guidelines, and the U.S. Government Standard Practices¹⁹, which demonstrates the interconnected nature of both domestic and international debris policies.
- IADC Guidelines²⁰: these Guidelines set forth an international effort to combat debris creation, and they mirror several efforts from the United States and other individual States. They are representative of the best practices recommended by several State space agencies, including NASA, JAXA, ROSCOSMOS, CNES, and others.²¹ 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.
- Space Policy Directive-3²²: Perhaps the greatest impetus for modifying the current FCC Orbital Debris Order (2004) comes from the actions of the Trump White House. In his third Space Policy Directive, President Trump ordered a large-scale review and evolution of space traffic management strategy and policy. After generally describing the ways in which using the space environment benefits the United States economically,

¹⁴ NASA Orbital Debris Program Office, <https://orbitaldebris.jsc.nasa.gov/mitigation/>.

¹⁵ U.S. Mitigation Practices, *supra* note 13.

¹⁶ NASA Technical Standard, *available at* <https://standards.nasa.gov/standard/nasa/nasa-std-871914>.

¹⁷ NASA Procedural Requirements for Limiting Orbital Debris, NPR 8715.6B (current version), *available at* https://www.orbitaldebris.jsc.nasa.gov/library/npr_8715_006b_.pdf.

¹⁸ NASA Technical Standard, *supra* note 16, at 5.

¹⁹ *Id.*

²⁰ Inter-Agency Debris Coordination Committee Guidelines, *available at* http://www.unoosa.org/documents/pdf/spacelaw/sd/IADC-2002-01-IADC-Space_Debris-Guidelines-Revision1.pdf.

²¹ *Id.* at 3.

²² SPD-3, *supra* note 4, at 28969-28976.

scientifically, and in defense, the Directive calls for revisions to current procedures. 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.”²³ Specifically, the Federal Communications Commission is tasked with assisting in the renovation of U.S. efforts in the field of space debris management, along with other relevant agencies. 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.²⁴

These are some of the primary tools the Commission had in its possession when redesigning their 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 Commission spoke of the probability of collisions between objects within the LEO region, referencing the relationship between energy and orbit of an object via NASA’s Technical Standard.²⁵

III. Proposed Rule: Mitigation of Orbital Debris in the New Space Age

Prior to the release of the Proposed Rule in early 2019, the Commission drafted and adopted a report, FCC 18-159, explaining their views on the necessity of reexamining the older rules. The report also announced the proposed rules it intended to supply to the Federal Register for notice and comment from the public. The Commission’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.²⁶ In reexamining their rules for orbital debris, the Commission has demonstrated that: 1) they are willing, able, and motivated to provide additional rigor and breadth to the existing rules; and 2) that they both desire and need input from the public to do so effectively. The Proposed Rule may look ready to implement, but the NPRM is replete with dozens of questions and calls for responses to their new (potential) regulations.

Some of these solicitations concern 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.”²⁷ Others concern 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 Commission appears particularly concerned with the presence and expansion of constellations of satellites. Indeed, “proposed deployments

²³ *Id.* at 28972.

²⁴ SPD-3, *supra* note 4, Sec. 6(f), at 28975.

²⁵ NASA Technical Standard, *supra* note 16.

²⁶ FCC 18-159, *supra* note 2, at 2-3.

²⁷ Mitigation of Orbital Debris in the New Space Age, NPRM, 84 Fed. Reg. 4742, 4744 (Feb. 19, 2019). [Hereinafter Proposed Rule]

of large satellite constellations in the intensely used LEO region...will have the potential to increase the risk of debris-generating events.”²⁸ In several places, it seeks comments on whether more stringent controls need to be placed on such systems, and in what manner. For instance, when addressing the safety of flight profiles:

The Commission seeks 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. The Commission invites comment on whether this metric should also be applied on an aggregate, system-wide basis, i.e., 0.001 for an entire constellation.²⁹

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 currently weigh 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 Commission is taking its mandate. The extent of their probing serves the concerns of Commissioners who felt that more information was needed, especially concerning the issue of expertise.³⁰ Given the importance attached to the issue by the Commission’s statements in FCC 18-159, the questions posed will serve as a potentially rich vein of policy and technical wisdom from which a Final Rule can be crafted. If this turns out not to be true, and if the feedback the Commission receives is largely unhelpful, at the very least they have made clear their reasoning in propounding their draft of the Proposed Rule. From this, it can be taken that the Commission is certainly moving regulation on the matter of debris—whether forwards or otherwise remains to be seen, although FCC 18-159 is clear that waiting to address the perceived problem is 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 driving this NPRM. However, another reason for the reconsideration of the earlier rules is conformity with international law and policy. The Commission references both the sustainability guidelines of UN COPUOS³¹, and the IADC Mitigation Guidelines³² as critical to its work. 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.

IV. Informational & Operational Norms

²⁸ *Id.*

²⁹ *Id.* at 4745.

³⁰ See, e.g., FCC 18-159, *supra* note 2, Statement of Commissioner Carr, at 61.

³¹ UN COPUOS Sustainability Guidelines, UN Document A/AC.105/L.315 (2018).

³² IADC Guidelines, *supra* note 20.

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

In one informational evolution, the Commission 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.³³ However, this did not include a requirement to assess whether 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"³⁴. This is required in several parts of the new rule³⁵, and ostensibly would serve to require justifying³⁶ 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."³⁷

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).³⁸ 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".³⁹

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.⁴⁰ The reasoning behind this being that objects in LEO 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.

³³ 47 CFR § 25.114(d)(14)(i).

³⁴ Proposed Rule, *supra* note 27, Sec. 5.64(b)(1), at 4754.

³⁵ *Id.*, Sec. 25.114(d)(14)(i), at 4755.

³⁶ FCC 18-159, *supra* note 2, at 9.

³⁷ Proposed Rule, *supra* note 27, Sec. 5.64(b)(3), at 4754.

³⁸ 47 CFR § 25.114(d)(14)(iii).

³⁹ FCC 18-159, *supra* note 2, at 10.

⁴⁰ Proposed Rule, *supra* note 27, Sec. 25.114(d)(14)(v)(C)(2), at 4756.

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

...declines to adopt a rule requiring space station operator to obtain insurance to protect the United States from exposure to liability claims arising from orbital debris, but states 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.⁴¹

In contrast, the Proposed Rule requires that, “as 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.”⁴² Such an indemnification requirement is a strong step in recognizing the damage that can occur not only to the physical environment of space, but to the United States more generally should damage occur for which it could be found liable.

Given these changes, the Proposed Rule differs most substantially from the 2004 Rule in its expansive, if occasionally confused⁴³ 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”.⁴⁴ With the SPD-3 contemplating the incorporation of new standards into licensing regimes for the various agencies involved in space operations⁴⁵, the FCC’s efforts in revising their 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.

V. Existential Communications Commission?

The final rule will be some time in coming, but some in the FCC have begun to question whether they are 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, asks “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?”⁴⁶

⁴¹ Mitigation of Orbital Debris, Final Rule, Federal Register, Vol. 69, No. 174, September 9, 2004, p. 54586.

⁴² Proposed Rule, *supra* note 27, Sec. 5.64(c), at 4754.

⁴³ 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.

⁴⁴ SPD-3, *supra* note 4, Sec. 6(b)(i), at 28974.

⁴⁵ *Id.*, Sec. 6(b)(ii), at 28974.

⁴⁶ FCC 18-159, *supra* note 2, Statement of Commissioner Brendan Carr, at 61-62.

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. Moreover, the Commission asks whether they are 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?”⁴⁷

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 Commission’s work in conjunction with those of entities like NASA and the Department of Defense. Further, despite expressing some doubt as to their mandate, the Commission 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.

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. In her concurrence to the decision to propose new rules, she expresses frustration that the Commission is not being forceful enough in tackling the problem. 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.”⁴⁸ 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....”⁴⁹ In theory, the comments received from the public for the NPRM may determine the “doneness” of the new regulations.

VI. Concluding Thoughts

Perhaps the most fascinating aspect of this NPRM exercise is in its possible outcomes. So much can change with the new rules, once input from the public has been received and processed. Alternatively, perhaps the Final Rule will look nearly identical to that presently

⁴⁷ Proposed Rule, *supra* note 27, at 4752.

⁴⁸ FCC 18-159, *supra* note 2, Concurrence of Commissioner Jessica Rosenworcel, at 163.

⁴⁹ *Id.*, Statement of Commissioner Michael O’Rielly, at 57.

proposed. Either way, it is clear that the FCC, for whatever doubts it may possess as to its function in the greater orbital debris and STM schemes, is situated to continue impacting federal efforts to minimize threats to the use, exploration, and exploitation of orbital space. With both internal Commission 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.