April 13, 2020

via ECFS and e-mail

Marlene H. Dortch
Secretary, Office of the Secretary
Federal Communications Commission
445 12th Street, SW, Room TW-A325
Washington, DC 20554

Re: **Mitigation of Orbital Debris in the New Space Age**
Docket No. 18-313
Streamlining Licenses Procedures for Small Satellites
Docket No. 18-86

Dear Ms. Dortch,

The below-signed academic researchers and industry partners in the areas of aerospace engineering, space sciences, and other related fields strongly urge the FCC to reverse course on the maneuverability and indemnification requirements in the April 2, 2020 draft Report and Order and Further Notice of Proposed Rulemaking ("Draft R&O") in the above-referenced docket under consideration for the April 23, 2020 Open Meeting.[1]

The proposed maneuverability and indemnification requirements in the Draft R&O would risk irreparable harm to the vast majority of academic SmallSat missions and the critical scientific, economic, and educational benefits they afford America, threaten U.S. leadership in space science, and reflect a failure by the Commission to adequately consider the record in this proceeding. We urge the Commission to revise the draft to eliminate the maneuverability requirement for satellite missions operating below 600 km, consistent with the 2019 Small Satellite Order,[2] and to eliminate the indemnification requirement for public universities in favor of a cross-waiver and release provision.

As the Commission acknowledges, the proposed maneuverability requirements for all satellites deployed above 400 km depart from the Commission's reasonable decision in the Small Satellite Order to set the altitude threshold for propulsion at

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[1] *See* ¶¶ 58-63 (maneuverability) and 146-165 (indemnification) ("Draft R&O"), https://docs.fcc.gov/public/attachments/DOC-363486A1.pdf.

[2] *See Streamlining Licensing Procedures for Small Satellites*, Report and Order, 34 FCC Rcd 13,077, 13,092, ¶ 42 (2019) ("Small Satellite Order").

missions deployed above 600 km.[3] In addition to departing suddenly and without reasoned explanation from the Commission's conclusions in the Small Satellite Order, the Draft Order largely ignores the input of the university small satellite community, which has consistently and strongly warned the Commission about the significant economic and operational consequences of a propulsion requirement for university small satellite missions.[4]

The Commission purports to address this issue by shifting from a propulsion requirement to a more general "maneuverability" requirement.[5] But the Commission undermines this notion two paragraphs away, arguing that "space stations using differential drag may not in some instances be able to reliably perform active collision avoidance."[6] This casts doubt on the notion of University Small-Satellite Researchers that "the employment of drag devices as means of collision avoidance" could provide a workable alternative to propulsion.

The Draft Order's approach to maneuverability suggests that academic SmallSat missions will be subject to Commission veto under a maneuverability standard that can only be met in practice by using prohibitively expensive and large

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[3] *See id.* at ¶¶ 59-60 (citing *Small Satellite Order*, 34 FCC Rcd. at 13092, ¶ 42).

[4] *E.g., Comment of University Small Satellite Researchers*, at 9-10, Docket No. 18-86, July 9, 2018, https://www.fcc.gov/ecfs/filing/107091398724499 (a 400 km requirement "would introduce unwanted consequences for researchers attempting to take advantage of the streamlined process," would not be workable "because it severely limits the potential orbits, lifetime, and uses of the small satellite," and would "limi[t] the orbital plane a small satellite can use and precludes polar orbits, which are of keen scientific interest for Earth and space weather observation"); *Reply Comments of University Small Satellite Researchers,* at 1-3, Docket No. 18-313, March 6, 2019, https://www.fcc.gov/ecfs/filing/105062044904107 (explaining that "[e]ven highly sophisticated university missions may only have design-to-demise budgets of $300,000," that "propulsion technologies—which are still in nascent stages for incorporation on small satellites—may cost upwards of $200,000," and that "the volume and power required by propulsion systems reduce capacity to include other elements, all else held constant, potentially rendering a university satellite unable to host a reasonable research payload.").

[5] Draft Order at ¶ 60 & n. 188 (acknowledging the concerns of University Small-Satellite Researchers that "it would be prohibitively expensive for university researchers to comply with propulsion requirements, and that mandating propulsion would effectively preclude university small-satellite missions from launching since many operate at altitudes between 400 and 600 km").

[6] *Id.* at ¶ 62 & n.193.

propulsion systems that are not appropriate for academic SmallSat missions. **The Commission should follow the Small Satellite Order's reasoning by limiting maneuverability requirements to missions above 600 km.**

Second, the Draft Order proposes an onerous indemnification requirement that in, the Commission's words, "was nearly universally opposed" by everyone who commented on it.[7] The requirement would effectively preclude a large proportion of academic SmallSat missions because public universities typically cannot legally enter into indemnification arrangements of the type contemplated by the Draft Order.

In our experience, most state institutions—including the University of Colorado—have restrictions or outright prohibitions against indemnification because they are subject to governmental immunity. Public universities should not be required—and often *cannot* be required—to accept liability and risk for third parties in this way. **We urge the Commission to reject the indemnification requirement in favor of cross-waiver and release provisions that are typically included in space treaties.**[8]

Respectfully submitted,

/s/

Blake E. Reid, Director
Jake Stephens, Student Attorney
Samuelson-Glushko Technology Law & Policy Clinic (TLPC)

Counsel to Dr. Scott Palo

blake.reid@colorado.edu

Dr. Scott Palo
Victor Charles Schelke Endowed Professor
University of Colorado Boulder
palo@colorado.edu • 303-492-4289

Dr. Sharanabasaweshwara Asundi
Assistant Professor of Space Systems Engineering
Department of Mechanical and Aerospace Engineering
Old Dominion University
sasundi@odu.edu • 757-683-3752

[7] *Id.* at ¶ 146.

[8] *See, e.g.,* 48 C.F.R. § 1852.228-78.

Dr. John Bellardo
Director, Cal Poly CubeSat Lab
Professor, Computer Science
California Polytechnic State University, San Luis Obispo
bellardo@calpoly.edu • 805-756-7256

Dr. Riccardo Bevilacqua
Associate Professor
University of Florida
bevilr@ufl.edu • 831-521-0119

Dr. Kerri Cahoy
Associate Professor
MIT Department of Aeronautics and Astronautics
kcahoy@mit.edu • 650-814-8148

Dr. John W. Conklin
Associate Professor
University of Florida
jwconklin@ufl.edu • 352-392-0614

Dr. Rick Doe
Senior Research Physicist
SRI International, Center for Geospace Studies
doe@sri.com • 650-859-2165

Dr. William Edmonson
Professor
North Carolina A&T State University
wwedmons@ncat.edu • 336-284-4549

Dr. Philip J. Erickson
Assistant Director, Principal Research Scientist
MIT Haystack Observatory
pje@haystack.mit.edu • 617-715-5769

Dr. Tim Kane
Professor of Electrical Engineering and Meteorology & Atmospheric Sciences
The Pennsylvania State University
tjk7@psu.edu • 814-863 8727

Dr. David M. Klumpar
Research Professor of Physics
Director, Space Science and Engineering Laboratory
Montana State University Department of Physics
klumpar@montana.edu • 406-994-6169

Dr. Kristina Lemmer
Associate Professor
Western Michigan University
kristina.lemmer@wmich.edu • 269-276-3417

Dr. E. Glenn Lightsey
David Lewis Professor of Space Systems Technology
Georgia Institute of Technology
glenn.lightsey@gatech.edu • 404-385-4146

Dr. Whitney Lohmeyer
Assistant Professor
Olin College of Engineering
wlohmeyer@olin.edu • 919-413-5434

Dr. Ben Malphrus
Executive Director, Space Science Center
Morehead State University
b.malphrus@moreheadstate.edu • 606-783 2212

Dr. Zachary Manchester
Assistant Professor
Stanford University
Department of Aeronautics and Astronautics
zacm@stanford.edu • 607-279-1358

Dr. Robert Marshall
Assistant Professor
University of Colorado Boulder
robert.marshall@colorado.edu • 303-492-4075

Dr. Robyn Millan
Professor of Physics and Astronomy
Dartmouth College
Robyn.Millan@dartmouth.edu • 603-646-3969

Dr. Giovanni Minelli
Faculty Associate - Research
Naval Postgraduate School
gminelli@nps.edu • 831-277-3466

Dr. Chandru Mirchandani
Adjunct Professor
George Washington University
chandru@gwu.edu • 301 609-0129

Dr. John Sample
Assistant Professor
Department of Physics, Montana State University
john.sample2@montana.edu • 406 994 1693

Mr. George Stafford
CEO and President, Blue Canyon Technologies, Inc.
stafford@bluecanyontech.com • 720-458-0703

Dr. Michael Swartwout
Associate Professor
Parks College of Engineering and Aviation, Saint Louis University
michael.swartwout@slu.edu • 314-977-8214

Dr. Charles M Swenson
Professor of Electrical and Computer Engineering
Director, Center for Space Engineering
Utah State University
charles.swenson@usu.edu • 435 797 2958

Dr. Thomas Woods
LASP Associate Director
Laboratory for Atmospheric and Space Physics (LASP), University of Colorado
tom.woods@lasp.colorado.edu • 303-492-4224

CC:
Matthew Berry and Aaron Goldberger, Office of Chairman Pai
Joel Miller and Erin McGrath, Office of Commissioner O'Rielly
Will Adams, Office of Commissioner Carr
Travis Litman and Umair Javed, Office of Commissioner Rosenworcel
William Davenport, Office of Commissioner Starks
Jose Albuquerque, International Bureau
Karl Kensinger, International Bureau