

JONES DAY

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September 19, 2017

VIA ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street S.W.
Washington D.C. 20554

Re: Oral *Ex Parte* Notice
IB Docket No. 16-408

Dear Ms. Dortch:

On September 18, 2017, representatives of The Boeing Company (“Boeing”) met with representatives of the Federal Communications Commission (“Commission”) to discuss the above-referenced proceeding. The meetings included individual meetings with Rachael Bender, legal advisor to Chairman Pai; Daudeline Meme, legal advisor to Commissioner Clyburn; Erin McGrath, legal advisor to Commissioner O’Rielly; Holly Saurer, acting legal advisor to Commissioner Rosenworcel; and Kevin Holmes, acting legal advisor to Commissioner Carr; and two group meetings, including one with Tom Sullivan, Troy Tanner, Jennifer Gilsenan, and Jose Albuquerque, of the International Bureau; and a second with Jose Albuquerque, Chip Fleming, Clay DeCell, and Sankar Persaud, of the International Bureau’s Satellite Division. Participating in all of the meetings were Audrey Allison, Senior Director of Frequency Management Services for Boeing, and the undersigned, with Alexander Epshteyn of Boeing participating in most of the meetings.

The Boeing participants touched on each of the issues addressed in the attached talking points, with most of the discussion focused on the Commission’s proposal for revised construction milestones for non-geostationary satellite orbit (“NGSO”) systems. Boeing presented the attached summary of the global capacity of the satellite launch industry for four and five meter launch vehicles. As demonstrated in the analysis, it would not be reasonably possible for an NGSO system that includes significantly more than 1,200 average-sized satellites to launch its constellation within six years. Therefore, the Commission’s proposal to require NGSO licensees to launch half their constellations within six years after licensing and the remaining half of their constellation within three years thereafter would not be possible for licensees of larger NGSO systems assuming the NGSO licensee employed average-sized satellites and began its full launch campaign three years after receiving a license.

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Boeing therefore proposed that an exception be made for Very Large NGSO Constellations, which Boeing would define as 1,000 or more satellites, allowing operators of Very Large NGSO Constellations to launch one third of their satellites within six years after licensing, another third within nine years after licensing, and the final third within twelve years after licensing.

The concept of requiring NGSO licensees to launch one third of their satellites within six years after licensing was previously proposed and supported in the comments that were filed by SES S.A. and O3b Limited¹ and in the reply comments of Telesat Canada.² The concept of treating larger NGSO constellations differently from smaller NGSO constellations with respect to milestones was previously proposed and supported in the comments of Space Exploration Technologies Corporation (“SpaceX”).³ Finally, the concept of allowing NGSO licensees a total of twelve years to complete their construction and launch milestones was previously proposed and supported in Boeing’s comments, which noted that any shorter launch schedule could overwhelm “the available launch capacity of commercial launch providers.”⁴ Therefore, each element of Boeing’s proposal for more flexible milestone requirements for Very Large NGSO Constellations was previously addressed in the record of this proceeding. It would therefore be reasonable and foreseeable for the Commission to adopt Boeing’s proposal in its order.

During Boeing’s meetings with Commission officials, Boeing representatives also discussed the Commission’s proposal to adopt a coordination trigger of 6% delta T/T for sharing between co-frequency NGSO systems. Boeing indicated that it could support this coordination trigger. Boeing also indicated that, given sufficient time to study the proposal, it may also be able to support a proposal that was recently made by SpaceX for an alternative coordination trigger for Earth-to-space communications of 25% delta T/T that would have to be met at an angle of no more than 10 degrees.⁵ Boeing therefore indicated that further consideration of the appropriate coordination trigger for both the uplink and downlink transmissions of NGSO

¹ See Comments of SES S.A. and O3B Limited, IB Docket No. 16-408, at 32-33 (Feb. 27, 2017) (proposing that NGSO licensees be required to launch one third of their satellites within six years, seventy five percent within nine years, and with no deadline to launch the remaining twenty five percent).

² See Reply Comments of Telesat Canada, IB Docket No. 16-408, at 32-33 (April 10, 2017) (proposing that NGSO licensees be required to launch one third of their satellites within six years and potentially with no milestone requirements thereafter).

³ See Comments of Space Exploration Technologies Corp., IB Docket No. 16-408, at iii, 15-16 (Feb. 27, 2017).

⁴ See Comments of The Boeing Company, IB Docket No. 16-408, at 19 (Feb. 27, 2017) (proposing that NGSO licensees be required to complete the launch of their complete constellations within 12 years following the grant of their licenses, observing that any shorter schedule could overwhelm “the available launch capacity of commercial launch providers”).

⁵ See Letter to Marlene H. Dortch, Secretary, Federal Communications Commission, from William M. Wiltshire, Counsel to SpaceX, IB Docket No. 16-408, at 3-4 (Sept. 15, 2017).

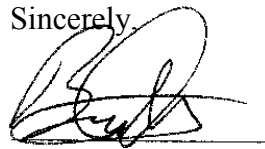
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satellites may be appropriate in the Commission's Further Notice in this proceeding. The Further Notice should also seek comment on the manner in which the Commission would determine whether the delta T/T approach is being implemented appropriately by NGSO FSS licensees.

Most important, regardless of the specifics of the coordination trigger employed, the Commission must mandate the use of a coordination trigger as a fall back to ensure that equitable spectrum sharing is achieved for all NGSO systems that are unable to reach bi-lateral coordination agreements with each other. Telesat has repeatedly argued that the Commission should discard all of the current proposals for coordination triggers as unworkable.⁶ Telesat's objection to the proposed coordination triggers is based on the significant amount of information sharing that will need to take place between co-frequency NGSO systems. Telesat's argument disregards the fact that any effective spectrum sharing arrangement between co-frequency NGSO systems – even one based on the coordination principles of the International Telecommunication Union – will require a significant amount of information sharing between co-frequency NGSO systems. Therefore, the Commission is fully justified to adopt its proposed coordination trigger for NGSO systems serving the United States and to mandate compliance with that trigger if co-frequency NGSO systems are unable to reach their own coordination agreements for spectrum sharing.

Thank you for your attention to this matter. Please contact the undersigned if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Bruce A. Olcott', written over a horizontal line.

Bruce A. Olcott
Counsel to The Boeing Company

Attachments

⁶ See, e.g., Letter to Mr. Jose P. Albuquerque, Chief, Satellite Division International Bureau, Federal Communications Commission, from Henry Goldberg, Counsel to Telesat Canada, at 2 (Sept. 13, 2017).

NGSO FSS Service Rules Proceeding

IB Docket No. 16-408

The Boeing Company

Milestones

- It is not reasonably possible for a satellite licensee to construct and launch a very large constellation of NGSO satellites within 9 years, or 50 percent of one within 6 years
 - The total capacity of the global launch industry would not permit this, even if half of the available capacity was used exclusively to launch one system (*see attached*).
- Additional flexibility is necessary for very large NGSO constellations, which should be defined as 1,000 or more satellites. They should be required to launch:
 - 34 percent of the satellites within six years (allowing for construction).
 - 33 percent of the satellites within another three years, and
 - 33 percent of the satellites within the final three years.
- If the percentages are not met, the number of satellites launched by the sixth year should not become the total permitted, but instead should become 34 percent of the total (for a very large NGSO constellation) or 50 percent for smaller NGSO constellations.
 - The licensee would forfeit its bond, but still be allowed to add additional satellites during the remaining 3 years (or 6 years for very large NGSO constellations) as long as they do not exceed the new 100 percent limit for that licensee.

Sharing Mechanism

- Boeing can support the Commission's proposal to use a $\Delta T/T$ of 6 percent as the default coordination trigger for sharing.
 - Telesat argues the FCC should simply require operators to negotiate in good faith, but Telesat has not indicated the technical sharing approach it would support.
 - Absent some technical approach that could be used for coordination, a default coordination trigger must be imposed as a starting point for good faith discussions.

Further Processing Rounds

- The Commission must protect the reasonable investment expectations of the existing round of applicants for NGSO FSS system licenses in the Ku, Ka- and V-bands.
- Consistent with the FCC's prior analysis, the Commission should accept additional applications only if less than three NGSO FSS systems (including non-FCC licenses) are launched using each of the Ku-, Ka-, and V-bands (counting O3b in the Ka-band).

Reductions in Constellation Size

- The draft order includes no policy justification for prohibiting licensees from seeking modifications to their licenses to reduce the size of their constellations.
 - Licensees that seek modifications will still be required to meet the milestone percentage for any new constellation size that is approved by the Commission.
 - Satellite licensees learn a great deal about their design constraints, capacity requirements and coverage capabilities during the construction process.
 - Rather than preclude changes, they should be considered on a case by case basis.

Geographic Coverage Requirements

- Boeing supports eliminating the international and domestic geographic coverage rules.
- Such rules are unnecessary to ensure global coverage and would prevent certain highly efficient constellation designs, such as the O3b system already authorized by the FCC.

Launching a Very Large NGSO Constellation

