

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Planet Labs Inc.)	File No. SAT-MOD-20150802-00053
)	Call Sign S2912
)	
Application for Modification of its)	
Authorization to Operate a)	
Non-Geostationary (“NGSO”) Earth)	
Imagery Satellite System)	

PETITION TO DISMISS, DENY OR HOLD IN ABEYANCE

ORBCOMM License Corp. (“ORBCOMM”) hereby requests that the Commission dismiss or deny the above-referenced application (“Application”) filed by Planet Labs Inc. (“Planet Labs”) due to the absence of an adequate demonstration that the non-geostationary orbit (“NGSO”) constellation proposed by Planet Labs will not create an unacceptable risk of collision with ORBCOMM’s NGSO satellite system. In the alternative, the Commission should hold this application in abeyance pending the provision of sufficient assurances that Planet Labs can eliminate that risk.

Of particular concern to ORBCOMM -- although it is not entirely clear from the information provided thus far -- the Application appears to propose an undetermined number of Planet Labs satellite deployments in one or more orbital planes that would intersect with the authorized 47 degree-inclined 715 km target operational orbits of the entire fleet of ORBCOMM Generation 2 (“OG2”) satellites. For example, a supplement to the Application filed by Planet Labs on December 8, 2015, provides partial information relating to at least one contemplated 720 km x 450 km 98 degree inclination orbit plane that would apparently consist of at least fifty-six

(56) Planet Labs spacecraft. Although intersecting orbital parameters are mentioned, the Planet Labs Application fails to make even a mention of ORBCOMM, much less provide a detailed analysis of the potential risk of collision between the Planet Labs and ORBCOMM systems, nor a description of what measures Planet Labs will take to avoid in-orbit collisions between those two systems.¹

It is impossible for ORBCOMM to adequately conduct its own analyses of the risk posed by the contemplated Planet Labs constellation due to the vague nature of the Application. The Commission's Rules require that an NGSO applicant specify, *inter alia*, the orbital parameters for its proposed constellation.² But rather than specify these parameters, Planet Labs apparently seeks authority to launch its satellites into a wide range of potential orbits, because it desires to be able to take advantage of opportunistic launches.³ Planet Labs requests in its narrative description that the Commission allow orbits of:

- Minimum Circular Altitude: 350 km
- Maximum Circular Altitude: 660 km
- Maximum Apogee: 720 km altitude (semi-major axis never exceeding 7,031 km, or 660 km above sea level)
- Inclination: 30 degrees and above⁴

The authorized target 715 km operational altitude of the OG2 satellites is definitely within the altitude range that Planet Labs appears to be requesting authorization to operate its

¹ See, *Mitigation of Orbital Debris*, 19 FCC Rcd 11567 (2004) at ¶ 50.

² 47 C.F.R. §25.114(c)(6).

³ Planet Labs Exhibit 43 at p. 4: "Planet Labs often takes advantage of 'last minute' launch opportunities, or launch opportunities where the exact orbit or exact number of satellites to be launched is not known until very close to the launch date."

⁴ Planet Labs Exhibit 43 at p. 3. The Commission's Rules specify when a licensee can deviate from the specified orbital parameters without prior approval -- 47 C.F.R. §25.118(f) -- which seems inconsistent with seeking authority to operate over a wide swath of orbits.

contemplated NGSO constellation. The Application mentions that Planet Labs may have an opportunity in the very near future to launch 56 of its satellites to a 720 x 450 km, 98 degree inclination orbit on a Falcon 9 rocket. If this is in fact the case, and if authorized by the Commission, such an orbit would intersect with the authorized target orbits of entire fleet of OG2 satellites, posing a risk of collision that is not acknowledged or adequately addressed in the Planet Labs Application. Of equal or greater concern, the Application provides no clear indication of how many of the 600 satellites Planet Labs seeks authority to launch might be placed into a similar intersecting orbit. While Planet Labs indicates that, “The majority of satellites will be launched to 475 km circular altitude, 97.3 degree inclination (Sun Synchronous Orbit)” – the narrative description included with its Application is not so limited.⁵ In fact, the information provided in the Application is so ambiguous that it cannot be determined with any specificity how many of the 600 contemplated Planet Labs satellites might be placed into orbits that intersect with ORBCOMM’s authorized orbits.⁶ Without knowing the specifics of the proposed Planet Labs constellation, it is impossible to adequately assess the risk of collision with ORBCOMM satellites.

In any event, the onus is on Planet Labs to demonstrate that its proposed orbit(s) will not create an unacceptable risk of collision. As the Commission explained when it adopted its orbital debris mitigation policies:

⁵ Planet Labs Exhibit 43 at p. 2. Indeed, in contrast to the request in the Narrative Description for a broad range of orbits, the orbital information required by Section 25.114(c)(6) of the Commission’s Rules, set forth in Item S4 of Planet Labs’ Schedule S only specifies a single plane of 200 satellites in a circular 475 km 97.3 degree inclined orbit. ORBCOMM has no objection to the Commission authorizing Planet Labs to deploy satellites in a 475 km circular orbit at any orbit inclination.

⁶ Although Planet Labs indicates that it will have no more than 200 satellites operational at any one time, any non-operational satellites in orbits that intersect with the ORBCOMM satellites will also pose a risk of collision.

We conclude, however, that in some instances the public interest would be served by a more detailed discussion of how an operator will avoid potential collisions. The first of these instances, as described in the *Notice*, is where a system will be launched into a low-Earth orbit that is identical, or very similar, to an orbit used by other systems. In such an instance we believe that the operator should submit, as part of its debris mitigation disclosure, an analysis of the potential risk of collision between the LEO systems and a description of what measures the operator plans to take to avoid in-orbit collisions. If the operator is relying on coordination with another system, the operator should indicate what steps have been taken to contact, and to ascertain the likelihood of successful coordination of physical operations with, the other system.⁷

Notwithstanding these instructions from the Commission, to date, Planet Labs has not contacted ORBCOMM to discuss collision avoidance, despite the requested overlap with the entire fleet of OG2 satellites proposed in the Application.⁸ Planet Labs did include some broad, conclusory assertions in its supplemental debris analysis about “Flock 2c” being compliant with NASA-STD 8719.14, section 4.5.2.1, but none of the underlying assumptions, calculations or analyses were included in that submission. Planet Labs did provide a slightly more detailed description of its analysis based on an assessment of 200 Planet Labs satellites in a 475 x 475 km, 97.3 degree inclination (SSO) orbit, but that is not necessarily the orbit or number of satellites that should be considered. In addition, ORBCOMM has no idea the extent to which ORBCOMM’s satellites were actually factored into Planet Labs’ analyses, since the most recent launch of OG2 satellites occurred on December 21, 2015, after Planet Labs submitted its supplemental Accidental Collision Risk Assessment.

ORBCOMM’s concerns relating to proposed Planet Labs orbit(s) that will overlap with authorized OG2 orbits are further exacerbated by the fact that the proposed design of the Planet Labs satellites makes effective collision avoidance coordination difficult or impossible.

Apparently Planet Labs is not incorporating on-board GPS receivers into their satellites, but will

⁷ *Mitigation of Orbital Debris*, 19 FCC Rcd 11567 (2004) at ¶ 50 (footnote omitted).

⁸ The authorized orbital parameters for the OG2 satellites are a matter of public record. *See, e.g., Public Notice*, Report No. SAT-01006, DA No. 14-418, released March 28, 2014.

instead rely on ranging data to perform orbit determination. ORBCOMM is skeptical that such ranging information will be adequate for meaningful conjunction assessments necessary for coordination with other satellite systems like ORBCOMM's. In addition, as Planet Labs explains:

The Flock satellites do not carry onboard propulsion, however some orbital maintenance can be performed using differential drag for phasing of the satellites along an orbital plane and for potential collision avoidance (if needed).⁹

Based on more than twenty years of experience operating the first-generation ORBCOMM satellites, ORBCOMM does not believe that relying entirely on differential drag maneuvering will be responsive enough to be an effective collision avoidance technique. Thus, the burden would fall entirely on ORBCOMM to undertake any necessary collision avoidance maneuvers. And such burdens would be very significant, because using fuel for such avoidance maneuvers will shorten the lifetime of the ORBCOMM satellites. Moreover, the absence of precise information on the location of the Planet Labs satellites due to the lack of onboard GPS receivers would very likely require ORBCOMM to undertake more maneuvers than if it had more exact location information, thus exacerbating the costs and burdens that would have to be solely borne by ORBCOMM. It would be unacceptable and contrary to the public interest to impose these obligations on ORBCOMM simply because Planet Labs wants to save money by using inexpensive satellites and taking advantage of opportunistic launches.

From ORBCOMM's perspective, the simplest solution would be for Planet Labs to select orbits that do not overlap with the ORBCOMM constellation. There is precedent for such a

⁹ Planet Labs Exhibit 43 at p. 6.

resolution,¹⁰ and ORBCOMM would have no objection to a Planet Labs application for orbits that do not overlap with ORBCOMM's. However, given the ambiguous open-ended nature of the Planet Labs Application as currently constituted -- with potentially as many as 600 satellites overlapping with ORBCOMM's constellation -- as well as the absence of any specific analyses of the risk of collisions that such overlaps would create, the Commission should deny or dismiss the Planet Labs Application. At the very least, the Commission should defer grant of the Application until it can be demonstrated to ORBCOMM's reasonable satisfaction that there is no unacceptable risk of collision with the ORBCOMM system. Grant of the Planet Labs Application as currently presented before the Commission, however, would disserve the public interest.

Respectfully submitted,



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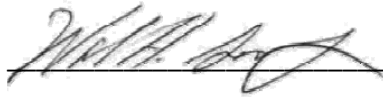
January 19, 2016

¹⁰ *Orbital Communications Corporation*, 17 FCC Rcd 6337 (2002) at ¶ 13.

CERTIFICATE OF SERVICE

I, Walter H. Sonnenfeldt, hereby certify that on this 19th day of January, 2016, I served a true and correct copy of the foregoing Petition to Dismiss, Deny or Hold in Abeyance of ORBCOMM License Corp. via first-class postage prepaid mail upon the following:

Michael Safyan
Planet Labs Inc.
346 9th St.
San Francisco, CA 94103

A handwritten signature in dark ink, appearing to read 'Walter H. Sonnenfeldt', written over a horizontal line.

Walter H. Sonnenfeldt