From: Gunnar Halley

To: Behnam Ghaffari
Date: August 11, 2020

Subject: FCC File No. 1134-EX-ST-2020

Message:

Re: Request for Further Information; File No. 1134-EX-ST-2020

Dear Mr. Ghaffari:

Microsoft Infrastructure Group LLC (“Microsoft”) hereby submits its response to the Commission's request for further information regarding its pending application for experimental Special Temporary Authority (“STA”) to test and demonstrate the capabilities of Microsoft Azure’s cloud computing network for the direct reception and processing of data from the Deimos-2 Earth Observation satellite. Microsoft has provided its answers to the Commission’s inquiries below:

1. Is the DEIMOS-2 the point of communication that will be used with this ground station, and is this spacecraft licensed to communicate with ground stations in the US?

The DEIMOS-2 spacecraft is the point of communication that will be used with the ground stations described in this application. The spacecraft is licensed by Spain and has not yet been granted U.S. market access by the FCC. Microsoft is requesting temporary authority for proof-of-concept demonstrations only (including for the download of images of the U.S., unless not permitted). The demonstrations will be to prospective earth observation customers in the lead-up to, during, and after Microsoft’s Ignite conference (https://www.microsoft.com/en-us/ignite). If the demonstrations result in significant market interest, Microsoft will file an application for regular earth station authority with the International Bureau (IB) to support future commercial operations, and that application will include a request for U.S. market access for DEIMOS-2. Microsoft understands that grant of the requested experimental STA would not pre-judge any subsequent IB earth station licensing decision or market access determination.

2. The application mentions the Quincy, WA earth station and a Brewster, WA earth station, but only the Quincy, WA earth station data was included in the application. Are the Brewster, WA earth station operations already licensed to communicate with the DEIMOS-2 satellite?

Microsoft understood that only transmitters (not receivers) should be listed on the experimental STA form and therefore did not include the Brewster, WA earth station on the form since it is a receive-only antenna for the X-band downlink from the DEIMOS-2 satellite. The Brewster, WA earth station is not licensed to communicate with the DEIMOS-2 satellite, but it has been authorized by the IB to receive in the X-band from a number of other satellites (IB call sign E990069). The receive parameters for the Brewster antenna can be found on the IB license for that earth station.

3. In the purpose of operation the applicant states “Microsoft does not seek authority to provide commercial service to users in the United States”, but in the supplemental material provide the applicant states “Grant of the requested authority will serve the public interest by … paving the way for Microsoft to offer a new, advanced service for EO customers in the U.S. and elsewhere”. As such, does the applicant intent to use these frequency bands to provide commercial services?

No commercial service will be provided pursuant to the experimental STA. Microsoft is requesting temporary authority for proof-of-concept demonstrations only. As noted above, the demonstrations will be to prospective earth observation customers in the lead-up to, during and after Microsoft’s Ignite conference. If the demonstrations result in significant market interest, Microsoft will file an application with IB for regular earth station authority to support future commercial operations, and that application will include a request for U.S. market access for DEIMOS-2. Microsoft understands that grant of the experimental STA would not pre-judge any subsequent IB earth station licensing decision.

4. In the supplemental material, the applicant states “Operational compatibility between DEIMOS-2 and the satellites of other EESS systems is managed through the international coordination process, and interference is unlikely because EESS systems operating in the 8025-8400 MHz band normally transmit only in short periods of time while visible from the dedicated receiving earth stations (typically less than 10 minutes for a single pass)”. However, the DEIMOS-2 is not licensed nor has it completed international coordination for operation with these earth stations in these frequency bands, so permitting the Quincy, WA or Brewster, WA earth station to receive data from this satellite will increase the interference potential to federal earth station operations. How does the applicant propose to mitigate these interference concerns?

With respect to Federal earth stations in the EESS operating in the same space-to-Earth direction as the proposed DEIMOS-2 downlinks, Microsoft notes that its proposed operations under experimental STA will be on a non-protected, non-harmful interference basis and downlink transmissions will be ceased in the event of any reports of harmful interference. While the DEIMOS-2 ITU filing envisages a downlink location in Alaska and not Washington state, Microsoft is seeking authority to downlink on a non-protected, non-interference basis pending supplemental ITU filings to cover this additional downlink location for regular FCC authority.

In addition, Microsoft is ready and willing to coordinate its proposed temporary operations with any federal earth station operations nearby, including providing advance notice of the timing and parameters of intended downlink transmissions. To this end, it has commenced coordination discussions with NASA and the U.S. Air Force. DEIMOS-2 uses a steerable X-Band antenna with a very narrow beam which will directly point at the earth station during data transmission. Given the geometries of downlinks from NGSO EESS satellites, there is a potential for harmful interference only when DEIMOS-2 and the Federal satellites are “in-line” (or nearly in-line) and transmitting on the same frequency and at the same time at earth stations located near one another on the ground, which would be very unlikely. Given the short duration of transmissions (about 5-7 minutes), electromagnetic compatibility should be possible by some combination of timing, frequency and/or angular separation between the Federal downlink and the DEIMOS-2 downlink.

With respect to other potential Federal users in the 8025-8400 MHz band (e.g. FS, FSS up, MSS up), Microsoft notes that any Fixed Services in the band will be protected by compliance with applicable PFD limits (as shown in the Experimental STA application narrative). In addition, any Federal FSS or MSS stations operating nearby in the uplink (Earth-to-space) direction will not be affected by the proposed use of this band in the downlink (space-to-Earth) direction.

Respectfully submitted,

Microsoft Infrastructure Group LLC

/s/ Gunnar Halley
Gunnar Halley
Assistant General Counsel