

### **Requests for Waiver of Commission Rules**

In this attachment, Kinéis sets forth its requests for limited waiver of the Commission's Rules. The Commission's Rules and precedents provide that the FCC has discretion to waive its rules where "good cause" is shown and grant of the requested waiver "would not undermine the policy objective of the rule in question and would otherwise serve the public interest."<sup>1</sup> In addition to the frequency-band specific justifications for waiver of the U.S. Table of Frequency Allocations detailed below, grant of this request will serve the public interest by allowing new satellite data and Internet of Things services without undermining the purpose of any of the identified Commission's Rules.

#### **A. 401-403 MHz (Earth-to-Space) Data & Telecommand Uplink**

The 401-403 MHz band is allocated to Earth-Exploration-Satellite Service ("EESS") and the Meteorological-Satellite Service ("METS") in the Earth-to-space direction. The U.S. Table of Frequency Allocations in Section 2.106 of the FCC's regulations contains a U.S. footnote, however, providing that in the entirety of this band "the non-Federal Earth exploration-satellite (Earth-to-space) and meteorological satellite (Earth-to-space) services *are limited to earth stations transmitting to Federal space stations.*"<sup>2</sup> Thus, while non-federal use may be authorized in the band, it must generally involve transmission to space stations that are operated by or for Federal government users.

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<sup>1</sup> See 47 C.F.R. § 1.3. See also *Northeast Cellular Telephone Co., L.P. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990) and *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969).

<sup>2</sup> See 47 C.F.R. §2.106 and footnote US384.

Kinéis is in a somewhat unique position in this regard in that some of the legacy ARGOS space modules for which it is the successor service provider meet the Federal government user criterion in that they are currently deployed under contract to the U.S. National Oceanographic and Atmospheric Administration (“NOAA”). Kinéis will take-over and improve the ARGOS service provided for several decades in the 401-403 MHz band. While maintaining backwards compatibility with installed base of beacons, new generation beacons will also be deployed together with the new constellation. NOAA is expected to continue using legacy ARGOS capacity, while at the same time Kinéis constellation will provide improved service to a larger base of users. Kinéis proposes to use portions of the 401-403 MHz band for two related purposes. The payload telecommand link reuses a frequency band already used in the ARGOS legacy system for satellite control. This ARGOS use of the band is already internationally recognized in ITU-R Recommendation SA.2045. This recommendation sets the partitioning of the band among different user categories, and the technical conditions applying to METS and EESS systems. The Kinéis system will operate along these internationally recognized guidelines. The dedicated telecommand link will use the 401.58-401.61 MHz band, the associated 30 kHz bandwidth accounts for Doppler shift. Using this band for the Kinéis system will ensure compatibility of the new ground segment with the legacy ARGOS system, while accommodating the telecommand requirements of the new system. No specific or additional interference issues are expected.

The system will include “system beacons” located at ground station sites. The purpose of the system beacons is to provide telecommand for the system. Some of the existing NOAA ground station sites already include such system beacons for ARGOS Legacy Satellites (*e.g.*,

Fairbanks/Gilmore Creek, Alaska). Kinéis plans to deploy about twenty ground station sites worldwide, including at least three in the U.S. territory (with sites tentatively to be located on the East Coast, the West Coast and in Hawaii). These low-band frequencies can greatly facilitate the reestablishment of a lost data communications link.

In any event, there is unlikely to be harmful interference because of the infrequent nature and type of transmissions to the satellite system, and Kinéis is committed to operating on a coordinated basis with respect to the Federal satellites and payloads in the band to avoid any possibility of harmful interference to existing Federal government users. Accordingly, the requested waiver is fully justified and in the public interest.

**B. 2200-2290 MHz (Space-to-Earth) Data & Telemetry Downlink**

The band 2200-2290 MHz is allocated internationally across all three ITU regions to the Space Operations, Space Research and the EESS, all in the space-to-Earth direction and for space-to-space links on a co-primary basis, as well as for terrestrial fixed and mobile uses. These allocations have been implemented in the United States through the provisions of Part 2 of the Commission's rules. However, similar to the uplink band discussed above, in the United States the band is not generally allocated for *non-Federal* satellite use.<sup>3</sup>

It is Kinéis' understanding that the band is heavily used in the United States by Federal government agencies for space and terrestrial telemetry, telecommand and control applications. These include the NASA Tracking and Data Relay Satellite System ("TDRSS") and the Air Force Space Ground Link Subsystem. NASA and NOAA also use this band to command and

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<sup>3</sup> See 47 C.F.R. § 2.106, footnotes 5.392 & US303.

control the Geosynchronous Operational Environmental Satellite (“GOES”) and other meteorological satellites.

Kinéis seeks to use a single carrier of one MHz bandwidth or less (including Doppler) in the band 2200-2290 MHz for both data retrieval and satellite telemetry (“TT&C”) to the twenty Earth Stations planned to be located at diverse locations on Earth. The location of the Earth stations is designed to provide low latency service to most areas in the world. The Kinéis payload and platform telemetry data will be multiplexed with primary mission data and downlinked to these Earth stations, all of which will include TT&C functionality. As noted above, these Earth stations are planned to include three locations in the United States.

Kinéis is confident that such a requirement could be satisfied within the 2200-2290 MHz range and can easily be coordinated with the Federal systems in the band. Kinéis, with the support of CNES (French space agency), has already initiated coordination discussions with the U.S. operators concerned, including the U.S. Department of Defense, and is willing to engage with NTIA and all Federal users of the spectrum to resolve any issues. The ARGOS service currently in operation is, in part, hosted on board NOAA satellites under an agreement that permits ARGOS data to be downlinked within the United States through L-band METSATS receive stations. This permits fast retrieval of valuable environmental and meteorological information captured by the ARGOS beacons to the benefit of the U.S. and wider scientific community. This service will be continued and enhanced in the future with the Kinéis nanosat constellation, should Kinéis be authorized to operate its S-band ground stations in the U.S. territory.

With regard to the compatibility with terrestrial services, the use of S band is for downlink only. The satellite emissions are designed so that the internationally agreed power flux density limits in ITU Radio Regulations Article 21 are met at all elevations. This ensures that no harmful interference is created to the Federal Fixed and Mobile Services identified in the US Table of Frequency allocation.

Outside of the United States, use of the band for downlinking appropriate data should be permissible in most countries. For these operations outside the United States, Kinéis will coordinate with NTIA prior to implementing service. It will have the capability to use various channels within the band that may be assigned in order to facilitate coordination and successful non-harmful-interference sharing of the band.

Within the United States, Kinéis requests a targeted waiver of the U.S. Table of Frequency Allocations to use the 2200-2290 MHz band (space-to-Earth) as a primary data downlink with its satellites on a non-conforming, non-harmful interference basis.<sup>4</sup> Should the Commission decline in providing the capability to Kinéis to operate its S-band downlinks in the U.S. territory, this could significantly degrade system performance for U.S.-based users as more time would be necessary for a satellite collecting beacon information over North America to reach an authorized ground station for downlinking the data to the network. Accordingly, grant of the limited waiver requested will serve the public interest by permitting more efficient state-of-the-art data collection to be provided to U.S. users, including providers of IoT monitoring, without causing harm to other operators in the band.

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<sup>4</sup> See 47 C.F.R. §§ 2.102(a) & 2.106.

### C. Antenna Gain Contours

Section 25.114(c)(4)(vi)(B) of the FCC's Rules specifies that the antenna gain contours to be included in Schedule S "should be plotted on an area map with the beam depicted on the surface of the earth with the space stations' peak antenna gain pointed at nadir to a latitude and longitude within the proposed service area."<sup>5</sup> Further, "the contours should be plotted at 2 dB intervals down to 10 dB below the peak gain and at 5 dB intervals between 10 dB and 20 dB below the peak gain."<sup>6</sup>

In the case of the Kinéis satellite beams operating in the 399.9-400.05 MHz (Earth-to-space), 400.15-401 MHz (space-to-Earth) and 401-403 MHz (Earth-to-space) frequency bands, the same spacecraft antenna is used. The satellite antennas used respectively in the 400 MHz range and in the 2200-2290 MHz band are fixed on the spacecraft and pointed at satellite nadir. They provide a quasi-isoflux gain pattern in order to compensate for part of the path loss at the lower elevations. As a result, the nadir gain is the minimum gain of the antenna, and it is not possible to represent "the space stations' peak antenna gain pointed at nadir" as required by the letter of the rule. For this reason, the gain contours are provided in dB above the nadir gain.

Accordingly, to the extent required, Kinéis requests waiver of Section 25.114(c)(4)(vi)(B) of the FCC's Rules in order to allow the acceptance of the beam contours as prepared. The requested waiver is reasonable under these unique circumstances and will serve the public interest by allowing a full and appropriate review of the petition without undermining the purpose of the Commission's Rules.

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<sup>5</sup> 47 C.F.R. § 25.114(c)(4)(vi)(B).

<sup>6</sup> *Id.*