

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of

Application of RBC Signals LLC for an)	
Extension of its Existing Special)	Call Sign: N/A
Temporary Authority To Operate an Earth)	
Station To Provide Tracking, Telemetry &)	File No.: SES-STA-20171213-01333
Command to U.S.-Licensed Cubesats)	

REQUEST FOR SPECIAL TEMPORARY AUTHORIZATION EXTENSION

RBC Signals LLC (“RBC Signals”), pursuant to Section 25.120 of the Commission’s Rules, 47 C.F.R. § 25.120, respectfully seeks an extension of its existing 60-day special temporary authorization (“STA”)¹ commencing on March 12, 2018. RBC Signals seeks to continue to operate two (2) yagi antennas – the M2 Antenna Systems Models 400CP30A and 450CP26 (the “M2 yagis”) – at a facility in Deadhorse, Alaska to communicate with certain U.S.-licensed low-Earth orbit (“LEO”) cubesats to perform tracking, telemetry and command (“TT&C”) in the 449.93-450.07 MHz band (Earth-to-space), 450.2-450.25 MHz band (Earth-to-space) and 401.43-401.57 MHz band (space-to-Earth). RBC Signals seeks this STA to allow it to continue operations consistent with its current *60-Day STA* until its long-term commercial license application² is acted upon by the Commission.

I. BACKGROUND

RBC Signals is a Seattle, Washington-based satellite services company that provides earth station services around the world. RBC Signals currently holds numerous STAs to provide similar

¹ See RBC Signals LLC, File No. SES-STA-20171213-01333 (expires on March 11, 2018) (“*60-Day STA*”).

² See RBC Signals LLC, File No. SES-LIC-20180201-00081, Call Sign E180010 (“*Earth Station Application*”).

TT&C support for certain LEO non-geostationary orbit satellite (“NGSO”) cubesats from the Deadhorse facility,³ including the U.S.-licensed Arkyd 6A and 6B experimental cubesats, which are the subject of this STA extension request.

Here, RBC Signals seeks to continue to conduct TT&C operations for the Arkyd 6A and 6B cubesats, which were developed by Planetary Resources Development Corporation (“PRDC”) to perform initial analysis of the technical and commercial feasibilities of PRDC’s commercial interplanetary space research vehicle for the exploration of near Earth asteroids (“NEAs”). The Arkyd 6A and 6B cubesats are currently authorized pursuant to multiple experimental authorizations from the Commission,⁴ allowing PRDC to analyze core spacecraft elements and mission operations, including space-based imaging, energy management, control and command execution and spacecraft communication. Although the Arkyd 6B launch date has not yet been finalized, RBC Signals seeks the authority to provide TT&C to the 6B cubesat in the event it is launched during the STA period.

The Arkyd 6A and 6B satellites will be launched into a nominal circular, sun-synchronous orbit with an inclination from the equator of approximately 98.0°. Once on-orbit, the Arkyd 6A and 6B satellites will operate at an altitude of approximately 500 km in the 2025-2110 MHz band (Earth-to-space) and 8450-8500 MHz band (space-to-Earth), subject to coordination with incumbent operations. RBC Signals does not seek to conduct service link testing or demonstration and only

³ See RBC Signals, LLC, File Nos. SES-STA-20170731-00848 (180-Day STA to provide TT&C for Sky and Space Global Ltd. cubesats), SES-STA-20180118-00042 (60-Day STA to provide TT&C for Astranis Space Technology Corp. cubesats).

⁴ See Planetary Resources Development Corporation, File No. 0025-EX-PL-2016, Call Sign WI2XES (granting authority to launch and operate the Arkyd 6B satellite); File No. 0285-EX-CR-2017, Call Sign WH2XRI (granting authority to launch and operate the Arkyd 6A satellite); and File No. 0871-EX-ST-2017, Call Sign WL9XQ0 (granting authority to perform limited TT&C for Arkyd 6A and 6B).

TT&C communications will continue to take place under this STA.

RBC Signals incorporates by reference the satellite technical specifications and mission overview information previously provided by PRDC and will perform the proposed TT&C operations consistent with the terms and conditions of PRDC's experimental authorizations.⁵ Additionally, RBC Signals incorporates by reference the information previously provided with its *60-Day STA* request,⁶ including the draft FCC Form 312 Schedule B and radiation hazard analyses. No information is changing as a result of this extension request.

Grant of this STA request is in the public interest because it will facilitate the uninterrupted and safe operation of the Arkyd 6A and 6B satellites during this critical evaluation stage and ensure no lapse in control. Moreover, a grant of this request will allow for more thorough demonstrations for these novel and important cubesat operations.

II. DISCUSSION

RBC Signals seeks to continue to operate the M2 yagis – variants of an earth station that has been previously licensed by the Commission for similar TT&C operations⁷ – with the Arkyd 6A and 6B satellites in the 449.93-450.07 MHz band (Earth-to-space), 450.2-450.25 MHz band (Earth-to-space) and 401.43-401.57 MHz band (space-to-Earth). RBC Signals has examined other operations in the subject bands and ensures that the proposed TT&C operations will not cause interference to current or future U.S. government users of the band, and that the short-term and longer-term interests of the United States are fully accommodated.

⁵ *Id.*

⁶ *Supra* n. 1.

⁷ *See, e.g.,* Spire Global, Inc., File No. SES-LIC-20160317-00247, Call Sign E160032.

A. TT&C Uplink Operations

The United States Table of Frequency Allocations (“Table of Allocations”), Section 2.106 of the Commission’s rules, 47 C.F.R. § 2.106 provides that the 449.75-450.25 MHz band may be used by non-federal stations for space telecommand (Earth-to-space), subject to such conditions that may be applied on a case-by-case basis.⁸ RBC Signals will operate the M2 yagis to perform limited TT&C uplink operations in frequencies from 449.93-450.07 MHz and 450.2-450.25 MHz consistent with the space telecommand allocation in this band. The limited transmission window, as well as the remote location of the facility (in the North Slope of Alaska), limit the potential for interference from the proposed operations.

RBC Signals understands that there is limited U.S. government use of the band⁹ and acknowledges that any grant of earth station operating authority herein must not cause interference to existing federal uses. In view of the foregoing, RBC Signals anticipates that its operations will be compatible with spectrum users and will present no potential for interference in the 449.75-450.25 MHz uplink band. RBC Signals will continue to conduct its TT&C operations on a non-harmful interference basis and, if RBC Signals learns that its operations are causing harmful interference to other operations, it will modify or suspend operations to immediately resolve such interference.

B. TT&C Downlink Operations

The Table of Allocations provides that the 401-402 MHz band is shared on a co-primary basis between meteorological aids and space operations services. RBC Signals seeks to perform TT&C downlink operations in frequencies from 401.43-401.57 MHz consistent with the co-primary

⁸ See 47 C.F.R. § 2.106, fn. US87.

⁹ See https://www.ntia.doc.gov/files/ntia/publications/compendium/0450.00-0454.00_01DEC15.pdf.

space operations allocation in this band.¹⁰ In the interest of administrative convenience and consistency, RBC Signals only seeks to utilize the identical sub-band authorized in the PRDC experimental license from from 401.43-401.57 MHz, which mirrors PRDC’s existing experimental authorizations, but reserves the right to request authority to operate in the 401-402 MHz band in its forthcoming commercial license application.

RBC Signals understands that there are certain U.S. government meteorological aids and earth exploration operations conducted in the 401-402 MHz band.¹¹ Based on our research and consultations to date, RBC Signals believes the proposed TT&C downlink (earth station receive) operations in this band will not present a potential for interference into other users of this band. However, if RBC Signals learns that its operations are causing harmful interference to other operations, it will suspend or modify its operations to immediately resolve such interference.

C. STA Request & Public Interest Considerations

Section 25.120(a) provides that an STA extension request should be filed at least three business days prior to the expiration of the existing temporary authorization. RBC Signal’s existing 60-day authorization expires on March 11, 2018, and thus it has timely filed this STA extension request. Pursuant to Commission rules, RBC Signals understands that this timely filed extension request will effectively extend its current temporary authority until the Commission acts on the instant request, affording sufficient time for processing this request and enabling RBC Signals to continue to support the Arkyd satellites.¹²

¹⁰ See 47 C.F.R. § 2.1 (defining “space operations” as “a radiocommunication service concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry, and space telecommand.”).

¹¹ See https://www.ntia.doc.gov/files/ntia/publications/compendium/0401.00-0402.00_01MAR14.pdf.

¹² See 47 C.F.R. §§ 25.120 & 25.163(b); Administrative Procedure Act § 9(b). See also 47 C.F.R. §1.955(b); *In the Matter of Marc D. Sobel Application for Consent to Assign the License for*

In addition, Section 25.120(b)(3) states that the Commission may grant a temporary authorization for up to 60 days if the STA request has not been placed on public notice and if a request for regulatory authority will be filed by the applicant. As noted, RBC Signals has already filed an application for the long-term earth station operations proposed herein.

Grant of this STA request will further the public interest by ensuring there is no interruption of RBC Signals' TT&C operations for the Arkyd satellites and enabling the continued demonstration of the significant benefits and commercial viability of PRDC's novel NEA exploration technology. For its part, the Arkyd 6A and 6B missions will provide vital information on asset management, tactical planning and mission strategy to facilitate the development of ground-breaking space exploration services. RBC Signals acknowledges that any action on the requested STA will not affect the Commission's ultimate determination with respect to its application for long-term TT&C earth station operating authority.

III. CONCLUSION

In view of the foregoing, the public interest would be served by a grant of this STA extension to allow RBC Signals to continue to perform TT&C for the U.S.-licensed Arkyd 6A and 6B satellites, commencing on March 12, 2018, following the expiration of the *60-Day STA*.

Conventional 800 MHz SMR Station KKT934, Montrose, California, Memorandum Opinion & Order, FCC 05-90, ¶¶ 2 & 6.