Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of

Application of RBC Signals LLC for a 60-Day Special Temporary Authorization ("STA") To Operate an Earth Station To Provide Tracking, Telemetry & Command ("TT&C") to U.S.-Licensed Cubesats	)))))	Call Sign: File No.:

REQUEST FOR SPECIAL TEMPORARY AUTHORITY

RBC Signals LLC ("RBC Signals"), pursuant to Section 25.120 of the Commission's Rules, 47 C.F.R. § 25.120, respectfully seeks a 60-day special temporary authorization ("STA") 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") for housekeeping, orientation and subsystem control following the satellites' launch. RBC Signals seeks to perform these short-term TT&C operations 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 60-day STA to ensure the timely initiation of TT&C operations following the satellites' first launch on January 4, 2018.

I. BACKGROUND

RBC Signals is a Seattle, Washington-based satellite services company that provides earth station services around the world. RBC Signals partners with other earth station operators or operates its own earth stations to efficiently support various satellite service applications. RBC Signals was previously granted short-term TT&C authority and currently holds a 180-day STA to

conduct similar TT&C operations from the Deadhorse, Alaska facility.[1] RBC Signals plans to seek long-term commercial authority to support its ongoing Deadhorse earth station operations.

Here, RBC Signals seeks short-term authority to conduct TT&C operations for the U.S.-licensed Arkyd 6A and 6B experimental 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,[2] allowing PRDC to analyze core spacecraft elements and mission operations, including space-based imaging, energy management, control and command execution and spacecraft communication. Here, RBC Signals seeks authority to conduct short-term TT&C following the Arkyd 6A launch on January 4, 2018 from India's Polar Satellite Launch Vehicle (the "PSLV-C40 mission")[3] to support PRDC's initial experimentation of this novel NEA exploratory technology. 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

[1] *See* RBC Signals, File Nos. SES-STA-20170613-00643 (expired on Aug. 22, 2017) and SES-STA-20170731-00848 (expires on March 10, 2018). In its initial STA request, RBC Signals included a request for a waiver of Section 25.202(g)(1) of the Commission's rules out of an abundance of caution but it does not appear to have been necessary for grant of temporary TT&C authority in this context. To the extent necessary to grant this 60-day STA request, RBC Signals hereby incorporates the waiver requests by reference.

[2] *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).

[3] *See* http://spaceflight.com/spaceflight-prepares-to-launch-eleven-spacecraft-on-indias-pslv-c40/.

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 TT&C communications will take place under this STA. This 60-day STA will cover initial TT&C for the Arkyd 6A and 6B satellites and RBC Signals plans to file an application for longer-term authority for the operations sought herein.

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.[4] RBC Signals provides the information herein, draft FCC Form 312 Schedule B and radiation hazard analysis for relevant information relating to the proposed TT&C operations. Grant of this STA request is in the public interest because it will ensure the timely initiation of TT&C for these novel and important cubesat operations and facilitate the safe operation of the Arkyd 6A and 6B satellites during these critical strategic evaluations.

II. DISCUSSION

RBC Signals seeks to operate the M2 yagis – variants of an earth station that has been previously licensed by the Commission for similar TT&C operations[5] – 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

[4] *Supra* n.2.

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

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.

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.[6] 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 reserves the right to seek authority to operate in the entire 449.75-450.25 MHz band in its forthcoming earth station license application.

RBC Signals understands that there is limited U.S. government use of the band[7] 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 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.

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[6] *See* 47 C.F.R. § 2.106, fn. US87.

[7] *See* https://www.ntia.doc.gov/files/ntia/publications/compendium/0450.00-0454.00_01DEC15.pdf.

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 space operations allocation in this band.[8] 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.[9] 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. Public Interest Considerations

RBC Signals respectfully requests this 60-day STA pursuant to Section 25.120 of the Commission's Rules, 47 C.F.R. § 25.120. Section 25.120(a) provides that STA requests should be filed at least three working days prior to the date of commencement of the proposed operations.

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[8] *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.").

[9] *See* https://www.ntia.doc.gov/files/ntia/publications/compendium/0401.00-0402.00_01MAR14.pdf.

Here, RBC Signals is proposing to commence operations on or about January 4, 2018 following the launch of the Arkyd 6A satellite. Additionally, the Commission may grant a 60-day STA if the STA request has not been placed on public notice and the applicant plans to file a request for regular authority for the operations. RBC Signals plans to file an application for longer-term authority as soon as possible to permit continuing TT&C operations for the Arkyd 6A and 6B mission.

This STA request is in the public interest because it will ensure that RBC Signals is able to commence TT&C in time for the launch of the Arkyd 6A satellite and assist PRDC in demonstrating the significant benefits of its novel NEA exploration technology. As discussed, 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 the application for longer-term TT&C earth station operating authority.

III. CONCLUSION

In view of the foregoing, the public interest would be served by a grant of a 60-day STA to allow RBC Signals to perform TT&C for the U.S.-licensed Arkyd 6A and 6B satellites commencing on or before January 4, 2018.