Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of

Application of RBC Signals LLC for a 30-Day Special Temporary Authorization To Operate an Earth Station To Provide Tracking, Telemetry & Command To Foreign-Licensed Satellites	)))))	Call Sign: N/A File No.: SES-STA-_____

Expedited Consideration Requested

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 30-day special temporary authorization ("STA") to operate an earth station (the "400 MHz Yagi") at its facility in Deadhorse, Alaska to communicate with certain foreign-licensed low-Earth orbit ("LEO") non-geostationary satellite orbit ("NGSO") cubesats (the "CICERO" spacecraft) operated by Tyvak Nano-Satellite Systems Inc. ("Tyvak"). RBC Signals seeks to perform tracking, telemetry and command ("TT&C") to provide housekeeping, coordination and subsystem control for the CICERO cubesats in the 401-401.3 MHz band (Earth-to-space/space-to-Earth).

RBC Signals requests grant of this 30-day STA at the earliest practicable time due to extraordinary circumstances that have resulted in the inability of Tyvak to adequately communicate with the CICERO spacecraft from its primary ground station. Accordingly, RBC Signals seeks this 30-day STA to operate the 400 MHz Yagi at its Deadhorse, Alaska facility to provide TT&C functions for the CICERO cubesat mission and ensure no lapse in essential ground station support.

I. BACKGROUND

RBC Signals is based in Seattle, Washington and provides earth station services around the world. RBC Signals partners with other earth station operators and operates its own earth stations to efficiently support various LEO satellite missions and applications. RBC Signals provides "infrastructure as a service," supporting satellite operators on an as-needed basis. Thus, rather than constructing and operating earth station facilities dedicated to particular satellites or systems, RBC Signals strives to flexibly and efficiently meets the needs of satellite operators including in the emergency circumstances presented here.

RBC Signals holds numerous STAs to provide TT&C support for similar LEO NGSO cubesat missions from Deadhorse, Alaska,[1] as well as a pending commercial application for long-term operations from the facility.[2] Accordingly, the proposed TT&C operations are nearly identical to those already authorized at the Deadhorse facility and there is no material change in the potential for interference from RBC Signals' authorized operations at this location. In the instant request, RBC Signals seeks short-term authority to conduct TT&C operations for the Norwegian-licensed CICERO spacecraft (four cubesats) in the 401-401.3 MHz band (Earth-to-space/space-to-Earth).

The CICERO cubesats are operated by Tyvak, a U.S. company that holds multiple experimental licenses from the Commission, including for the first demonstration satellite of the CICERO mission.[3] The subject Norwegian-licensed CICERO satellites, which operate pursuant

[1] *See, e.g.*, RBC Signals, LLC, File Nos. SES-STA-20180302-00176, SES-STA-20170613-00643 & SES-STA-20170731-00848. These authorizations enabled RBC Signals to provide TT&C support for the U.K.-licensed 3 Diamonds NGSO satellites in the 401-402 MHz band.

[2] *See* RBC Signals, LLC, File Nos. SES-LIC-20180201-00081 & SES-AFS-20180321-00238, Call Sign E180010.

[3] *See* Tyvak Nano-Satellite Systems Inc., File No. 0399-EX-PL-2016, Call Sign WI2XKJ (*"CICERO Experimental License*").

to authority granted by the Norwegian Communications Authority ("Nkom"),[4] are technically identical versions of the 6U cubesat previously described to the Commission in the *CICERO Experimental License*.[5] The operations proposed herein are fundamentally similar to those previously approved by the Commission *CICERO Experimental License* and RBC Signals will operate consistent with Tyvak's existing experimental authorization.

RBC Signals seeks this urgent 30-day STA due to a mechanical failure of Tyvak's TT&C ground station in Norway, which has left Tyvak unable to adequately communicate with the CICERO spacecraft. Tyvak is working diligently to resolve the matter but certain circumstances, including limited availability of parts and personnel, prevent implementation of near-term remedial measures. Tyvak requires TT&C support from RBC Signals, an existing ground station partner, because it can provide immediate support for the CICERO cubesats from its existing facility in Deadhorse, Alaska during the pendency of Tyvak's primary ground station repair efforts.

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[4] *See* Technical Appendix, III. Pursuant to the regulatory procedures adopted by Nkom, the attached submission of Advance Publication Information from Nkom to the International Telecommunications Union ("ITU") constitutes the Nkom authorization action for the CICERO spacecraft.

[5] The CICERO satellites will operate under the Tyvak-0082 ITU NGSO system filings. RBC Signals acknowledges that authority for TT&C operations does not constitute market access to the United States for the Tyvak satellites and therefore is not providing the full technical information required by Sections 25.114 and 25.137 of the Commission's rules, 47 C.F.R. §§ 25.114 and 25.137. *See, e.g.*, SES Americom, Inc., File No. SES-MFS-20160624-00607, Call Sign E050287 (granting authority for an earth station to provide TT&C services to the foreign-licensed ASTRA 3A operating at 86.85° W.L.); Hawaii Pacific Teleport, L.P., File No. SES-MFS-20131030-00913, Call Sign E030115 (granting authority for an earth station to provide TT&C services to ASTRA 3A operating at 176.85° W.L.); SES Americom, Inc., File No. SES-STA-20161110-00884, Call Sign E050287 (granting authority for an earth station to provide TT&C services to ASTRA 3A during drift from 86.85° W.L. to 47.0° W.L.); Hawaii Pacific Teleport, L.P., File No. SES-STA-20131030-00914, Call Sign E030115 (granting authority for earth station to provide TT&C services to ASTRA 3A operating at 176.85° W.L).

Grant of this STA request is critical for the ongoing reliability of the CICERO mission and will allow for the short-term continuation of TT&C services while Tyvak works to address the issue at the Norway ground station site. RBC Signals highlights the emergency nature of this situation and is coordinating with Commission staff to potentially begin TT&C operations immediately. RBC Signals' short-term TT&C operations will be conducted on an unprotected and non-interference basis and only as-needed to communicate with the CICERO spacecraft as it passes over the Deadhorse earth station (several times per day with an average access time of five to seven minutes).

RBC Signals provides the attached Technical Appendix and draft FCC Form 312 Schedule B for information relating to the proposed earth station operations and the CICERO spacecraft. In addition, RBC Signals will conduct these earth stations in accordance with the Commission's rules and interagency requirements governing fixed earth station operations in the subject band. Grant of the requested STA – which is necessitated by extraordinary and unforeseen circumstances preventing the effective TT&C communications with the CICERO cubesats – will serve the public interest, convenience and necessity.

II. DISCUSSION

RBC Signals seeks to operate a 400 MHz Yagi[6] in the 401-401.3 MHz band (Earth-to-space/space-to-Earth) to provide immediate, near-term support for the CICERO cubesats. The proposed TT&C operations are consistent with RBC Signal's existing operations at the Deadhorse facility in the 401-402 MHz band,[7] which have caused no interference to other users of the band. The CICERO spacecraft, launched in mid-2017, have a mission life of over two years and an orbit

[6] The M2 Antenna Systems Model 400CP30A.

[7] *Supra* n. 1.

period of approximately 1.6 hours. The spacecraft will operate in a sun-synchronous orbit with an at an orbital altitude of approximately 550 km and an inclination of 97.8°. RBC Signals incorporates by reference the CICERO satellite technical specifications previously provided in the *CICERO Experimental License*[8] and provides the Nkom Email Authorization[9] for additional information relating to the CICERO spacecraft.

The goal of the CICERO mission is to perform GPS Radio Occultation ("RO") measurement demonstrations in support of Tyvak's development of atmospheric sensors of earth exploration satellite services ("EESS"). The collection of RO data will be used to validate the mission and quality of data collected. Grant of this STA request is critical for the ongoing reliability of the CICERO mission and will allow for the short-term continuation of services while Tyvak resolves the ground station malfunction in Norway.

A. TT&C Frequency Use

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 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 uplink and downlink operations in the 401-401.3 MHz band pursuant to the co-primary space operations allocation in this band.[10]

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[8] The Commission has previously reviewed the Orbital Debris Assessment Report for the CICERO spacecraft in context of Tyvak's experimental license application. To the extent the Commission seeks addition information, RBC Signals will provide such supplemental information at earliest possible time.

[9] Attached to the Nkom Email Authorization is the ITU SpacePub submission reflecting the CICERO information available on the ITU website.

[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.").

RBC Signals understands that there is no U.S. government use of the 400.05-400.15 MHz sub-band,[11] but there are certain meteorological aids and space research operations conducted in the 400.15-400.25 MHz sub-band.[12] Based on our research and consultations to date, RBC Signals believes the proposed TT&C operations in this band will continue to present no potential for interference to other users of this band. The Deadhorse facility currently supports ground station operations in the 401-402 MHz band with no reported cases of interference and RBC Signals believes its similar TT&C operations in this band will not present a potential for interference into other authorized users. In addition, prior coordination and present TT&C operations at the Deadhorse facility suggests that expedited processing and grant of this request would not adversely affect other users of the spectrum. If RBC Signals learns that its operations are causing harmful interference to others, it will suspend or modify its operations to immediately resolve such interference.

B. STA Request & Public Interest Considerations

RBC Signals respectfully seeks this 30-day STA pursuant to Section 25.120 of the Commission's rules, 47 C.F.R. § 25.120. Given the "extraordinary circumstances" surrounding this request, RBC Signals requests that the Commission authorize operations under this STA at the earliest practicable time.[13] Based on consultations with the Commission staff, RBC Signals

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[11] *See* https://www.ntia.doc.gov/files/ntia/publications/compendium/0400.05-0400.15_01DEC15.pdf.

[12] *See* https://www.ntia.doc.gov/files/ntia/publications/compendium/0400.15-0401.00_01DEC15.pdf.

[13] 47 C.F.R. § 25.120(a). The Commission may authorize RBC Signals to commence operations under this STA sooner than 3 working days "upon due showing of extraordinary reasons for the delay." As discussed herein, given the unique and unpredictable circumstances of this request an expedited grant of this STA is warranted.

understands that the unique circumstances here may warrant temporary authority for near-term TT&C from the Deadhorse, Alaska facility.

Grant of this STA request is in the public interest because it will facilitate the safe operation of the CICERO satellites in the near-term by ensuring reliable TT&C support following the inoperability of the Norway ground station. Grant of this STA request will also promote U.S. leadership in the development next-generation satellite technologies by enabling a U.S. ground station to support the evaluation of the benefits and commercial viability of Tyvak's EESS and atmospheric monitoring services.

III. CONCLUSION

In view of the foregoing, including the inability to provide ground station support for the CICERO spacecraft and the importance of reliable TT&C operations, the public interest would be served by a grant at the earliest practicable time of a 30-day STA to allow RBC Signals to perform TT&C functions for four CICERO cubesats using the 400 MHz Yagi from Deadhorse, Alaska.