

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

Kongsberg Satellite Services AS (“**KSAT**”) submits this narrative supplement to its application for modification of the license for its receive-only earth station in Fairbanks, Alaska (call sign E160028) (“**Station**”), SES-LIC-20160218-00154, initially granted on February 14, 2017¹ and modified on March 19, 2018 to add a second point of communication, SES-MFS-20170825-00955² (“**Station License**”). KSAT seeks to add an additional point of communication: a non-U.S. licensed space station, PAZ (“**Satellite**”), which hosts the exactView-8 payload (“**EV8**”). The Station will receive data transmissions from EV8 on a non-interference basis. The Station will not transmit and will operate on a non-common carrier basis. KSAT seeks no other changes to the Station License or to any previously authorized operations.

This application consists of FCC Form 312 Main Form, Schedule B and Schedule S and Exhibits A-D. This narrative, Exhibit A, contains three sections:

- Section 1 describes the nature of the request and service to be provided (Main Form, Question 43) and the KSAT remote control point (Schedule B, Question E17), and sets forth KSAT’s legal and technical qualifications and a public interest statement.
- Section 2 provides information on the non-U.S. licensed satellite operation in response to Main Form, Question 42a, and pursuant to 47 C.F.R. §§ 25.131(c) and 25.137.
- Section 3 provides justification for granting the following waiver requests in response to Main Form, Question 35: (i) Waiver of non-conformance with domestic allocation; and (ii) waiver of non-geostationary satellite default processing rounds.

¹ Kongsberg Satellite Services AS Application to Operate a New Receive-Only Earth Station in Fairbanks, AK, FCC IBFS No. SES-LIC-20160218-00154 (“**Station License Application**”) (granted Feb. 14, 2017) (for the EV1 satellite); modified by Kongsberg Satellite Services AS Modification Application to Add a Point of Communication to its Receive-Only Earth Station in Fairbanks, AK, FCC IBFS No. SES-MFS-20170825-00955 (granted Mar. 19, 2018) (for the EV7/M3MSat satellite); see also Kongsberg Satellite Services AS Application for 180-Day Special Temporary Authority for EV1, FCC IBFS No. SES-STA-20180313-00209 (filed Mar. 13, 2018, presently pending; KSAT is operating with EV1 under 47 C.F.R. § 1.62 pending action on the application).

² See *supra* note 1.

1. NATURE OF THE APPLICATION AND SERVICES: A RESPONSE TO QUESTIONS 43 AND E17

1.1. Request for Authorization

KSAT submits this information pursuant to 47 C.F.R. §§ 25.102, 25.117 and 25.131(j)(1) in support of its application to modify the Station License to add the Satellite as an additional point of communication. The Satellite is a Spanish-authorized and operated non-geostationary satellite.

1.2. The Proposed Service

The Station is a receive-only earth station located in Fairbanks, Alaska, that is currently supporting other satellites operated by exactEarth, Ltd. of Ontario, Canada (“**exactEarth**”), namely exactView-1 (“**EV1**”) and exactView-7 (“**EV7**”). KSAT proposes to use the same MEOS 5m C-band antenna at the Station for EV8 that it uses for EV1 and EV7. Using this antenna, the Station will acquire payload data from EV8 in the 5167.5000-5198.5000 MHz band (feeder links), without any changes to the equipment currently in place or to the other satellites’ operations.³

EV8’s mission is to perform satellite-based collection of (i) Automatic Identification System (“**AIS**”) and Application Specific Messaging (“**ASM**”) signals from ship-based transponders in the VHF maritime mobile band, and (ii) VHF-band signals from ground-based transponders in the Land Mobile service (collectively, “**VHF Signals**”). The Land Mobile transponders are operated by exactEarth’s Australian partner, Myriota Pty. Ltd. (“**Myriota**”), as part of a commercial trial.⁴ EV8 will downlink VHF Signal

³ The Station presently receives communications from the Canadian EV1 satellite in the 5167.5000-5198.5000 MHz band and from the Canadian EV7 satellite in the 5169.5000-5196.5000 MHz band using the same MEOS 5m C-band antenna and will continue to do so in accordance with the respective authorization for each point of communication.

⁴ The Myriota transponders are small, low-cost mobile transmitters for Internet-of-Things (“IoT”) applications. These transponders are designed to transmit to land mobile base stations in normal circumstances and for their transmissions to be detected by satellites when a transponder is out of range of a base station, *i.e.*, in “low and remote density areas.” These transponders are licensed by the Australian Communications and Media Authority (“ACMA”) for operation using the Land Mobile bands between 161.1000 and 161.4750 MHz. *See, .e.g.*, Apparatus Licence Issued by Delegate of the Australian Communications and Media Authority to Myriota Pty. Ltd., License No. 10522808/1 (issued Oct. 3, 2018) (“Stations authorised by this licence may communicate with space receive stations.”).

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

data to the Station. KSAT does not seek a license for transmissions or reception by EV8. KSAT also does not seek authorization for other missions of the Satellite, which are described further in section 2.1, below.

The Station will receive VHF Signals data from EV8 during the “visible” portion of the Satellite’s orbit. The Station will not be used for TT&C. The Station will not transmit. The Satellite, including the EV8 hosted payload, is authorized by the Spanish authorities (“**Spanish Authorization**”).⁵ See **Exhibit C, Spanish Authorization**.

The Station will be operated on a non-common carrier basis. KSAT is under contract to exactEarth to operate the Station for VHF Signals data acquisition from EV8, contingent on the Commission’s approval. The data from the Station will be relayed over the internet using a secure VPN connection to exactEarth’s facility in Cambridge, Ontario, Canada.

1.3. Public Interest Statement

Granting a license to operate the Station with EV8 is in the public interest. It promotes the availability of and timely access to VHF Signals data from EV8 and complements the data currently being received from EV1 and EV7. The AIS and ASM data to be downlinked supports critical functions, including maritime situational awareness, maritime safety, port security, search and rescue, and combating illegal, unreported and unregulated, or so-called “IUU,” fishing.⁶

It is also in the public interest to aid the development of Myriota’s satellite-linked IoT transponder technology, which is currently in commercial trials, by authorizing the downlink at the Station of data from those transponders collected by EV8.⁷ Businesses and organizations globally (particularly those that have operations in rural or sparsely

⁵ Letter from Celestino Menéndez Argüelles, Plans Area Coordinator, Ministry of Energy, Tourism and Digital Agenda of the Government of Spain to Miguel Ángel Panduro, Chief Executive Officer, Hisdesat Servicios Estratégicos, S.A. (Nov. 24, 2017) (“**Spanish Authorization**”). The letter includes an authorization for the use by PAZ of frequencies in “the band 5167.5 - 5198.5 MHz with the technical characteristics published in special section CR / C 3472 MOD-1 of BRIFIC 2786 of January 20, 2015” This is the band that KSAT requests to use to receive data from the Satellite at the Station.

⁶ See United States of America Proposals for the Work of the Conference, WAC/081(27.08.14) (noting the benefits of AIS).

⁷ See Myriota, Low cost satellite IoT connectivity, <http://myriota.com/low-cost-satellite-iot-connectivity/low-cost-satellite-iot-connectivity/> (last visited Nov. 27, 2018).

populated areas, such as those with an agricultural, energy, or environmental focus) stand to benefit from access to low-cost transponders that would facilitate remote machine-to-machine connectivity.

1.4. Applicant’s Legal and Technical Qualifications

KSAT is a global leader in ground station operations for non-geostationary satellites. The company operates a world-wide network of ground stations including high- and mid-latitude stations. Please see KSAT’s initial Station License application⁸ for a more detailed discussion of KSAT’s qualifications and ownership.

1.5. Earth Station Frequency Band

The earth station will acquire VHF Signals data from the Satellite (via feeder links) in the following frequencies:⁹

Center Freq. (MHz)	Lower Freq. (MHz)	Upper Freq. (MHz)	Bandwidth (MHz)	International Allocation	Domestic Allocation
5183	5167.5	5198.5	31	RR, fn. 5.447B	No; need waiver

This frequency band (5167.5-5198.5 MHz) overlaps with the band that was previously authorized for reception from EV1 and EV7 at the Station.¹⁰ EV8 signals will be downlinked to the same antenna used for EV1 and EV7 and this application does not request any modification of the operations with those previously authorized points of communication.

1.5.1. International Allocations

The 5150–5216 MHz band has been allocated internationally for non-geostationary mobile satellite service (“MSS”) feeder links through footnote 5.447B, which provides as follows: “[T]he band 5150–5216 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. This allocation is limited to feeder links of non-

⁸ *Station License Application, supra* note 1, Exhibit A, Narrative Supplement, sec. 1.4.

⁹ *See Spanish Authorization, supra* note 5.

¹⁰ *Station License, supra* note 2 and accompanying text.

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

geostationary-satellite systems in the mobile-satellite service and is subject to provisions of No. 9.11A.”¹¹

Footnote 5.447B applies here because: (i) The frequency band requested for use with EV8 (5167.5-5198.5 MHz) is within the band segment addressed by the footnote; (ii) the band requested will be used for feeder links; (iii) the Satellite is a non-geostationary satellite; and (iv) EV8 is operating in the MSS. EV8 will be used for satellite-based VHF Signals collection from transponders on ships and from land-based mobile transponders. The satellite-based collection of these VHF Signals (AIS-1 and -2¹² and ASM-1 and -2¹³ signals and Land Mobile¹⁴ signals) constitutes MSS.¹⁵ (See Section 2.3.2(d), below, for a detailed list of the Satellite’s VHF Signal operating frequencies.)

¹¹ ITU Radio Regulations, art. 5, note No. 5.447B. See ITU Radio Regulations, No. 9.11A (stating that coordination is required if a footnote requires it).

¹² See ITU 2016 Radio Regulations, Appx. 18, Specific Note p (“Additionally, AIS 1 [161.975 MHz] and AIS 2 [162.025 MHz] may be used by the mobile-satellite service (Earth-to-space) for the reception of AIS transmissions from ships.”).

¹³ ASM is a maritime mobile satellite service. See RR 5.228AA (“The use of the frequency bands 161.9375-161.9625 MHz and 161.9875-162.0125 MHz by the maritime mobile-satellite (Earth-to-space) service is limited to the systems which operate in accordance with Appendix 18.”). Maritime mobile satellite service is a type of MSS. See RR 1.29 (defining maritime mobile-satellite service as a mobile-satellite service in which mobile earth stations are located on board ships) and 47 C.F.R. § 2.1 (using the definition from the ITU Radio Regulations).

¹⁴ See *supra* note 4 (describing the EV8 detection of Land Mobile transmissions by Myriota transponders). Myriota’s transponders are mobile earth stations licensed by ACMA for operation using Land Mobile bands between 161.1000 and 161.4750 MHz on a temporary basis within the geographic area of Australia, which includes authorization to transmit for satellite-based reception when a transponder is out of range of a land base station, *i.e.*, in “low and remote density areas.”

¹⁵ See 47 C.F.R. § 2.1 (defining Mobile-Satellite Service: “A radiocommunication service: (1) Between mobile earth stations and one or more space stations, or between space stations used by this service; or (2) Between mobile earth stations by means of one or more space stations.”). EV8 will use the following bands: 161.9625–161.9875 MHz (AIS-1); 162.0125–162.0375 MHz (AIS-2); 161.9375–161.9625 MHz (ASM-1); 161.9875–162.0125 MHz (ASM-2); and 161.1000–161.4750 MHz (Land Mobile) bands. Channels 2027 and 2028 of the VHF maritime mobile band are presently designated for “testing of future AIS applications” on a non-interference basis and will be designated ASM 1 and ASM 2, respectively, starting in 2019. See ITU 2016 Radio Regulations, Appx. 18, Specific Note z.

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

Consistent with footnote 5.447B, the EV8 C-band downlink has been notified to the International Telecommunication Union (“ITU”) in accordance with ITU Radio Regulations Article 11¹⁶ and the Commission.¹⁷ See **Exhibit B, Technical Supplement**.

Footnote 5.447C imposes certain additional ITU coordination requirements on operations that are subject to footnote 5.447B¹⁸ and these requirements are satisfied. The power flux-density requirements in footnote 5.447B¹⁹ will be observed.

1.5.2. Domestic Allocation and Request for Waiver

The international feeder link allocations in the 5150–5216 MHz band are not found in the Domestic Table of Frequency Allocations; specifically, footnote 5.447B is not included in the domestic allocations for the 5150–5250 MHz band.²⁰ Accordingly, KSAT

¹⁶ The Satellite’s downlink operation (the C-band beam, “MDC,” under the ITU name PAZ) has been notified to the ITU Radiocommunication Bureau under International Radio Regulations, Article 11. See ITU, BR IFIC 2884 (IFIC date Nov. 27, 2018) (publication under Part I-S). The downlink beam was previously included in a request for coordination under Article 9.11A. See BR IFIC 2764 (IFIC date Mar. 4, 2014) (regarding publication under Special Section CR/C for the PAZ C-band downlink).

¹⁷ See Amendment of the Commission’s Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States, 15 FCC Rcd. 7207, FCC 99-325 ¶ 5 (1999) (“DISCO II Recon Order”) (noting that a non-U.S. satellite operator seeking U.S. market access through an in-orbit satellite must have “initiated international coordination negotiations for that satellite network pursuant to the [ITU’s] international Radio Regulations . . .”).

¹⁸ Footnote 5.447C provides: “Administrations responsible for fixed-satellite service networks in the band 5150–5250 MHz operated under Nos. . . . 5.447B shall coordinate on an equal basis in accordance with No. 9.11A with administrations responsible for non-geostationary-satellite networks operated under No. 5.446 [radiodetermination] and brought into use prior to 17 November 1995. Satellite networks operated under No. 5.446 brought into use after 17 November 1995 shall not claim protection from, and shall not cause harmful interference to, stations of the fixed-satellite service operated under No. . . . 5.447B.”

¹⁹ See ITU Radio Regulations, art. 5, note No. 5.447B (“The power flux-density at the Earth’s surface produced by space stations of the fixed-satellite service operating in the space-to-Earth direction in the band 5150–5216 MHz shall in no case exceed –164 dB (W/m²) in any 4 kHz band for all angles of arrival.”).

²⁰ 47 C.F.R. § 2.106 (2017), containing the U.S. Table of Frequency Allocations, which in pertinent part provides:

Table of Frequency Allocations				3500-5460 MHz (SHF)		Page 41
International Table			United States Table			FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table		
5150-5250 FIXED-SATELLITE (Earth-to-space) 5.447A MOBILE except aeronautical mobile 5.446A 5.446B AERONAUTICAL RADIONAVIGATION			***		5150-5250 FIXED-SATELLITE (Earth-to-space) 5.447A US344 AERONAUTICAL RADIONAVIGATION US260	RF Devices (15) Satellite Communications (25) Aviation (87)
5.446 5.446C 5.447 5.447B 5.447C			US211 US307 US344		5.447C US211 US307	

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

requests a waiver of the Commission’s rules for feeder link reception in the 5150–5216 MHz band. As explained further in Section 3.1 below, a waiver is warranted here since the operation of the earth station conforms to the International Radio Regulations and will be on a non-interference basis; nor does KSAT request protection from interference. The downlink serves the public interest by providing timely access to VHF Signals data.

1.5.3. Coordination with Federal Users

The 5150–5250 MHz band is also allocated domestically to aeronautical radionavigation on a co-primary basis for federal uses. KSAT respectfully requests the Commission’s assistance in coordinating with the National Telecommunications and Information Administration, as necessary.

1.6. The Receive-Only Earth Station and Remote Control Point

1.6.1. The Station

The Station is hosted at Iridium’s Alaska Ground Station in Fairbanks, Alaska, located at 900 Bidwell Avenue, Fairbanks, AK 99701. exactEarth will continue to own the Station antenna used for reception from Satellite and KSAT will continue to operate the Station remotely from the Tromsø Network Operations Center, in Tromsø, Norway. There will be no modifications to the existing Station equipment to accommodate EV8, which will use the same antenna that EV1 and EV7 will continue to use.

1.6.2. Points of Contact

The points of contact are the same. KSAT’s TNOC can be reached 24/7 at +47 77 60 02 68. Iridium’s POC at the site is Blaine Bronson, phone number (907) 451-9842. Iridium’s Satellite Network Operations Center (SNOC) can be contacted 24/7 for emergency support if needed at (703) 724-8300.

1.7. Section 304 Waiver Statement

Pursuant to Section 304 of the Communications Act, 47 U.S.C. § 304, KSAT hereby waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise.

2. INFORMATION ON THE NON-U.S. LICENSED SATELLITE OPERATION
PURSUANT TO 47 C.F.R. §§ 25.131(c) AND 25.137: A RESPONSE TO
QUESTION 42a

2.1. The Foreign Satellite

The Satellite (PAZ), which hosts the EV8 hosted payload, was launched on February 22, 2018 and is operating under the Spanish Authorization.²¹ The Satellite supports EV8's VHF Signals data collection in the following bands: 161.9625–161.9875 MHz (AIS-1), 162.0125–162.0375 MHz (AIS-2), 161.9375–161.9625 MHz (ASM-1), 161.9875–162.0125 MHz (ASM-2),²² and 161.1000–161.4750 MHz (Land Mobile).

The Satellite is owned and operated by Hisdesat Servicios Estratégicos, S.A. of Madrid, Spain. exactEarth Ltd., of Ontario, Canada is responsible for the EV8 hosted payload mission, including for establishing the payload command plan and planning for data acquisition, pursuant to a hosting agreement with Hisdesat. Under that hosting agreement, exactEarth generates a downlink schedule and sends commands for the EV8 hosted payload to Hisdesat, who uploads the commands to the hosted payload on the PAZ satellite via Hisdesat's TT&C link. exactEarth is the owner of the VHF Signals data; there is no sharing of the hosted payload data with Hisdesat. See Section 2.3 for additional information on the Satellite and the other missions onboard.

EV8 will downlink VHF Signals data to the Station using the 5167.5–5198.5 MHz band (space-to-Earth). KSAT does not seek authority for any other frequencies used by the Satellite. KSAT provides this information in conformity with 47 C.F.R. §§ 25.131(c) and 25.137 for the Station to receive signals from the Satellite (which is authorized by Spain).

²¹ See *supra* note 5. The Spanish Authorization authorizes operations in the 156.7625-162.0375 MHz band “as published in IFIC 2842.” The AIS and ASM frequencies are covered in that IFIC, but Land Mobile is not included; rather the Spanish Government has subsequently filed an API for Land Mobile for these frequencies in IFIC 2872 (IFIC date June 12, 2018). See *infra* note 35.

²² At WRC-15, the ITU allocated the maritime VHF channels centered at 161.950 and 162.000 MHz for “testing of future AIS applications” on a non-interference basis and those channels will be designated for ASM-1 and ASM-2 starting in 2019. See ITU 2016 Radio Regulations, Appx. 18, Specific Note z.

2.2. DISCO II Showing – Section 25.137(a)

As discussed in sections 2.2.1–2.2.3 and 2.3, below, KSAT satisfies the DISCO II criteria for obtaining the Commission’s authorization to communicate with exactEarth’s EV8 payload hosted on Hisdesat’s Satellite using the Station.

2.2.1. Competitive Aspects

In the *DISCO II Order*,²³ the Commission adopted a rebuttable presumption in favor of U.S. market entry for non-U.S. licensed satellites authorized by WTO member countries.²⁴ Spain, the authorizing authority for the Satellite, is a WTO member.²⁵ Second, MSS is covered under the WTO Basic Telecommunications Agreement as a Basic Telecommunications Service,²⁶ and both the satellite-based reception of AIS and ASM signals from ships²⁷ and the reception of signals from land mobile earth stations²⁸ are a form of MSS. Accordingly, the DISCO II rebuttable presumption in favor of market entry applies. As shown in section 1.3, above, downlinking VHF Signals data is in the public interest. Satellite AIS authorizations have also been granted to several U.S. entities by the Commission.²⁹

²³ Amendment of the Commission’s Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Service in the United States, Report and Order, FCC 97-398, 12 FCC Rcd. 24094 (1997) (“*DISCO II Order*”). See also *DISCO II Recon Order*, *supra* note 17 at ¶ 1.

²⁴ See 47 C.F.R. § 25.137(a)(2). See also *DISCO II Order*, *supra* note 23, ¶ 44. See, e.g., Space Imaging, LLC, Declaratory Order and Order and Authorization, FCC DA 05-1940 (July 6, 2005) (“*Space Imaging Order*”) (applying a rebuttable presumption to EESS).

²⁵ *Understanding the WTO: Members and Observers*, WORLD TRADE ORGANIZATION, https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm (last visited Nov. 27, 2018).

²⁶ See General Agreement on Trade in Services, The United States of America Schedule of Specific Commitments, Supplement 2, GATS/SC/90/Suppl.2 (Apr. 11, 1997), available at https://www.wto.org/english/tratop_e/serv_e/telecom_e/telecom_commit_exempt_list_e.htm (including satellite services).

²⁷ See *supra* notes 12 and 13 (explaining that AIS and ASM are MSS).

²⁸ See *supra* note 14 (explaining that the Myriota transponder land mobile signal reception is MSS).

²⁹ See, e.g., Orbcomm License Corp. Application For Authority to Modify its Non-Voice, Non-Geostationary Satellite System, Order and Authorization, DA 08-633 ¶¶ 12-15 (FCC rel. Mar. 21, 2008).

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

2.2.2. Spectrum Availability

The Commission also considers spectrum availability to be a factor in determining whether to allow a foreign-licensed satellite to serve the U.S. market.³⁰ EV8 will downlink VHF Signals data to the Station in the 5167.5–5198.5 MHz band.

As shown in Section 1.5.1, above, the 5150–5216 MHz band (which encompasses the Satellite’s downlink frequency band) is allocated internationally on a primary basis for MSS (space-to-Earth) feeder links through footnote 5.447B. Because there is no companion domestic allocation for MSS feeder links in this band, KSAT requests a waiver to allow this non-conforming frequency use. As demonstrated in Section 3, below, a waiver is justified based on Commission’s rules and precedent.

Domestically, the 5150–5250 MHz band is allocated on a co-primary basis to Aeronautical Radionavigation (for Federal and non-Federal uses) and Fixed Satellite Service (Earth-to-space) (for non-Federal uses). The downlink to the Station will not interfere with other conforming uses in the band for the following reasons:

First, the Satellite’s downlink within the 5150–5250 MHz band has been submitted to the ITU Radiocommunication Bureau in accordance with International Radio Regulations, and has been included in a Part I-S publication for the Satellite.³¹ Second, a search of the FCC’s database for current FCC authorizations in the proposed band reveals no licensed Aeronautical Radionavigation operations in the relevant location (Alaska).³² Third, the proposed reception from the Satellite is substantially similar to the current reception from the EV1 satellite. EV1 and EV8 have substantially similar beam characteristics – the beam width, power level and frequency are similar, although the antennas differ due to EV8 being a hosted payload. Fourth, the current operation of the Station in that band (e.g., with EV7) has not caused any interference complaints to

³⁰ See *DISCO II Order*, *supra* note 23, ¶¶ 149–150 (“Further, spectrum considerations may arise in cases where the foreign service provider seeks access to the U.S. market by filing an earth station application to access an operating non-U.S. satellite. In these cases, we must determine whether, and to what extent, the proposed U.S. service will impact existing operations in the United States.”).

³¹ See *supra* note 16. See also Exhibit B, Technical Supplement, sec. 1.

³² See Exhibit B, Technical Supplement, sec. 2 (Site / Frequency / Market Search Results). See also IBFS SES Location Search, available at <http://licensing.fcc.gov/myibfs/pointSearch.do>, which shows no licensees other than KSAT and Globalstar when searching using the following parameters: Latitude=64° 49' 4", Longitude=147° 43' 9", Radius=1000, Frequency Lower=5150 MHz, Frequency Upper=5250 MHz.

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

KSAT's knowledge. exactEarth previously coordinated the downlink for the EV1 satellite³³ in these frequencies with Globalstar, the only other licensee known to be using the 5150–5250 MHz band in the state of Alaska.

The bands in which EV8 will receive VHF Signals have either been notified for registration (as in the case of AIS and ASM³⁴) or advance published (as in the case of Land Mobile³⁵) by the ITU.

2.2.3. National Security and Foreign Policy Issues

Granting this earth station application to operate with the Satellite, authorized by the Spanish government, is consistent with the national security and foreign policy interests of the United States. exactEarth makes satellite AIS data available under contract to the U.S. government. AIS data serves critical public interest functions.

2.3. The Satellite: Legal and Technical Information – Section 25.137(b)

2.3.1. Legal Information

exactEarth Ltd., of Ontario, Canada has a hosted payload agreement with Hisdesat Servicios Estrategicos S.A. for the hosting of the EV8 payload on the PAZ Satellite. Hisdesat owns and operates the Satellite and is responsible for the Satellite's primary mission and for performing TT&C. exactEarth is solely responsible for the hosted payload mission for VHF Signals collection, including for establishing the payload command plan and planning for data acquisition via the dedicated C-band data downlink, pursuant to the hosting agreement with Hisdesat.³⁶

exactEarth, Ltd. is a publicly-traded company listed on the Toronto Stock Exchange (ticker symbol XCT), and is organized under Canadian law. The following legal

³³ See *Station License Application*, *supra* note 1, Exhibit B, Technical Supplement.

³⁴ See ITU, BR IFIC 2842 (IFIC date Apr. 4, 2017) (regarding publication of PAZ frequencies under Part II-S, including frequencies for reception of AIS and ASM signals in the VHF maritime mobile band).

³⁵ Advance Publication Information for the Satellite's reception of signals in the Land Mobile band (161.1000–161.4750 MHz) has been submitted to the ITU. See the publication for PAZ (NTC ID 109540646) under Special Section API/A in BR IFIC 2872 (IFIC date June 12, 2018) (publishing a beam named "AISU" with a frequency band spanning 157.3625–162.0375 MHz, which covers the Land Mobile frequency band of 161.1000–161.4750 MHz).

³⁶ See *supra* sec. 2.1, above.

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

information on exactEarth is provided in accordance with Section 25.137(b) of the Commission’s rules:

- (a) exactEarth Address and Telephone Number.³⁷ 260 Holiday Inn Drive, Unit 30, Building B, Cambridge, ON N3C 4E8, Canada; tel. +1 519-622-4445.
- (b) Regulatory Status.³⁸ The Satellite is operated on a non-common carrier basis.³⁹
- (c) Basic Qualifications.⁴⁰ The answer to each of the basic qualifications Questions 36-39 on FCC Form 312, Main Form, is “No.” In response to FCC Form 312, Main Form, Question 40, as of September 19, 2018, Hisdesat Servicios Estrategicos S.A. of Madrid, Spain held 27% of exactEarth’s outstanding common stock and MM Asset Management Inc., a Canadian fund investment company, held approximately 19%; no other entity holds more than 10% of exactEarth’s voting shares. The company is not subject to denial of Federal benefits for reasons described in Main Form, Question 41.
- (d) Coordinating Administration.⁴¹ The Satellite is authorized by the government of Spain, which is the ITU notifying administration responsible for the Satellite’s (PAZ) operations.
- (e) Public Interest Considerations.⁴² Public interest considerations supporting grant of this applications are set forth in section 1.3, above.
- (f) Milestones, Bond and Related Requirements.⁴³ The Satellite, which was launched on February 22, 2018, is operating as authorized under the Spanish Authorization. Thus, this application does not raise any issues regarding milestones or posting of bonds under section 25.137(d).

³⁷ See FCC Form 312, Questions 1-8.

³⁸ See FCC Form 312, Question 21; 47 C.F.R. § 25.114(c)(11).

³⁹ 47 U.S.C. § 153(11).

⁴⁰ See FCC Form 312, Questions 36-41.

⁴¹ See FCC Form 312, Question 42b.

⁴² See 47 C.F.R. § 25.114(d)(6).

⁴³ See 47 C.F.R. § 25.137(d).

2.3.2. Technical Information

Section 25.137(b) requires the provision of “technical information for the non-U.S.-licensed space station of the kind that section 25.114 would require in a license application for that space-station, including but not limited to, information required to complete Schedule S.” Schedule S is included with this application, and this section and **Exhibit B, Technical Supplement**, augment that information:

- (a) General description of the Satellite (§ 25.114(d)(1)). The Satellite (PAZ) is a medium-sized non-geostationary satellite whose primary mission is earth observation using synthetic aperture radar. EV8 is a separate payload hosted on the Satellite, which contains a VHF Signal data receiver that will operate concurrently with the primary mission. The Satellite also includes an experimental payload called the Radio Occultation and Heavy Precipitation experiment (ROHP), a joint effort between the Spanish Institute of Space Sciences (ICE-CSIC/IEEC) and Hisdesat. Neither the primary mission nor the ROHP experimental payload downlink to or otherwise involve the Station.
- (b) Lifetime (§ 25.114(c)(10)). The Satellite was launched by a SpaceX Falcon 9 launch vehicle from Vandenberg Air Force Base in California on February 22, 2018. The Satellite will be operated for its operational life, which was initially estimated to be 7 years (2025).
- (c) Satellite orbit information (§ 25.114(c)(6)). The Satellite is located at an orbit of 514 x 514 km @ 97.44°. The Schedule S for the Satellite included in this application provides relevant orbital information, including (i) number of space stations and orbital planes; (ii) the inclination of the orbital plane; (iii) the orbital period; (iv) the apogee; (v) the perigee; (vi) the argument of the perigee; (vii) active service arc; (viii) right ascension of the ascending node, and (ix) for each satellite in each orbital plane, the initial phase angle at the reference time.⁴⁴
- (d) Frequencies (§ 25.114(c)(4), § 25.114(c)(7)). The Satellite is authorized to operate pursuant to its Spanish Authorization in the following frequency bands (only bands relevant to this application are listed⁴⁵):

⁴⁴ Not applicable to the Satellite.

⁴⁵ See Exhibit C, Spanish Authorization for the Satellite’s other authorized frequencies.

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

Frequency Bands (MHz)	Usage Description	International Allocation	U.S. Domestic Allocation
161.9625–161.9875 MHz (AIS-1)	Receive AIS signals	Yes	Yes
162.0125–162.0375 MHz (AIS-2)	Receive AIS signals	Yes	Yes
161.9375–161.9625 MHz (ASM-1)	Receive ASM signals	Yes	No
161.9875–162.0125 MHz (ASM-2)	Receive ASM signals	Yes	No
161.1000–161.4750 MHz (Land Mobile)	Receive Myriota signals	No	No
5167.5–5198.5 MHz (space to Earth)	Downlink VHF Signals data	Yes	No

The last row identifies the band for which KSAT seeks authorization to receive from the Satellite at the Station. See Schedule S and **Exhibit B, Technical Supplement**, for additional details on the frequencies used by the Satellite. KSAT is not seeking authorization for any frequencies other than the C-band downlink.

- (e) *Power Flux Density Levels (§ 25.114(c)(8))*. The power flux-density requirements in footnote 5.447B⁴⁶ and in 47 C.F.R. § 25.208 will be observed. Please see **Exhibit B, Technical Supplement** for additional details.
- (f) *Tracking, Telemetry and Control Arrangements (§ 25.172)*. TT&C for operations of the Satellite are performed by Hisdesat’s ground stations in Torrejon (near Madrid, Spain) and Maspalomas (Spain’s Canary Islands). No TT&C operations for the Satellite will be conducted in the United States (or anywhere outside of Spain).
- (g) *Physical Characteristics of the Space Station*. The Satellite is a non-geostationary satellite that measures 5 meters in height and 2.4 meters in diameter. The Satellite’s prime contractor was Airbus Defence & Space, involving a consortium of 18 Spanish companies and universities. The Satellite weighs approx. 1400 kg. The Satellite has propulsion for station-keeping and end-of-life disposal. Please see **Exhibit D, Orbital Debris Mitigation Statement** for additional details.
- (h) *Coordination Considerations*. The Satellite frequencies, including the 5167.5–5198.5 MHz C-band downlink and the AIS and ASM frequencies are consistent with the International Table of Frequency Allocations as described in Section 1.5.1, above, and have been submitted to the ITU Radiocommunication Bureau for coordination and

⁴⁶ See ITU Radio Regulations, art. 5, note No. 5.447B (“The power flux-density at the Earth’s surface produced by space stations of the fixed-satellite service operating in the space-to-Earth direction in the band 5150–5216 MHz shall in no case exceed –164 dB (W/m²) in any 4 kHz band for all angles of arrival.”).

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

notification for recording in the Master Register under International Radio Regulations, Article 9.11A and 11.2.⁴⁷ See **Exhibit B, Technical Supplement** for the ITU notification information. The Myriota transponders are licensed by the Australian Communications and Media Authority (“ACMA”) and the detection of Land Mobile signals by the Satellite is authorized by that license.⁴⁸ The Satellite’s downlink to the Station will be operated on a non-interference basis.

- (i) *Orbital Debris (§ 25.114(d)(14))*. Please see **Exhibit D, Orbital Debris Mitigation Statement**. The statement is provided in an attempt to meet the requirements of 47 C.F.R. §§ 25.137(d); 25.114(d)(14). The maximum estimated time for the Satellite to deorbit is less than 25 years.

2.4. Processing Rules – Section 25.137(c): A Request for a Waiver

Please see KSAT’s request for a waiver of the modified processing round procedure for NGSO-like space station applications in section 3.2, below.

3. JUSTIFICATION OF WAIVER REQUESTS: A RESPONSE TO QUESTION 35

KSAT requests two waivers: (i) Waiver for using an MSS feeder link with an international, but not a domestic allocation; and (ii) waiver of the default processing rules for non-geostationary satellites.

The Commission may waive any of its rules if there is “good cause” to do so.⁴⁹ In general, a waiver is appropriate if: (i) Special circumstances warrant a deviation from the general rule; and (ii) such deviation would better serve the public interest than would strict adherence to the general rule.⁵⁰ Generally, the Commission will grant a waiver of its rules in a particular case if the relief requested would not undermine the policy objective of the rule in question and the waiver would otherwise serve the public

⁴⁷ See *supra* notes 16 (for the C-band downlink) and 34 (for the AIS and ASM frequencies); see also Exhibit B, Technical Supplement.

⁴⁸ See *supra* notes 4 and 35.

⁴⁹ See 47 C.F.R. § 1.3; see also *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969), cert. denied, 409 U.S. 1027 (1972).

⁵⁰ *Northeast Cellular*, 897 F.2d at 1166.

interest.⁵¹ As shown below, good cause exists for the Commission to grant these waiver requests.

3.1. Waiver for Nonconforming Use of Frequencies for MSS Feeder Link

As explained in section 1.5.1, above, the 5150–5216 MHz band – which includes the band for the proposed downlink from EV8 to the Station (5167.5–5198.5 MHz) – has been allocated internationally for non-geostationary MSS feeder links through footnote 5.447B. No such allocation exists in the Domestic Table of Frequency Allocations as footnote 5.447B has not been added.⁵² Accordingly, KSAT requests a waiver of Section 2.102⁵³ and 2.106⁵⁴ of the Commission’s rules to permit the proposed nonconforming use of the 5167.5–5198.5 MHz band.

Good cause for a waiver exists here. The receive-only Station has no potential for causing interference. The C-band downlink from the Satellite will not cause interference because (i) the use of this band has been notified to and published by the ITU;⁵⁵ (ii) exactEarth previously coordinated the use of this band for the downlink of AIS data from the EV1 satellite to the Station with Globalstar, the only other licensee found to be operating in the 5150–5250 MHz band in Alaska (the EV8 downlink has substantially similar characteristics); (iii) the operation complies with the power flux-density limits imposed by footnote 5.447B of the ITU Radio Regulations; and (iv) KSAT currently operates the Station receiving exactEarth satellite transmissions in this band and is not aware of any interference complaints. See **Exhibit B, Technical Supplement**. The purpose of the rule in Section 2.102 (requiring that frequency use conform to the Domestic Table of Frequency Allocations to prevent harmful interference) would not be undermined, since no interference would result from this use.

The Commission has stated that it is inclined to grant waivers where there is “little potential for interference.”⁵⁶ The Commission has stated repeatedly that where a station

⁵¹ *WAIT Radio*, 418 F.2d at 1157.

⁵² *See supra* note 20 and accompanying text.

⁵³ 47 C.F.R. § 2.102(a) (requiring compliance with the U.S. Table of Frequency Allocations in 47 C.F.R. § 2.106).

⁵⁴ 47 C.F.R. § 2.106 (containing the U.S. Table of Frequency Allocations).

⁵⁵ *See supra* note 16 (regarding publication of C-band downlink band in Part I-S); *see also* Exhibit B, Technical Supplement.

⁵⁶ *contactMEO Communications, LLC*, 21 FCC Rcd. 4035, at ¶ 25 (released Apr. 14, 2006) (“[I]n considering requests for non-conforming spectrum uses, the Commission has indicated it would

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

is merely receiving existing signals, as is the case here, there is no risk of additional interference.⁵⁷ KSAT does not seek protection from interference.

Second, the public interest is served by increasing the availability and timeliness of AIS and ASM data, which reception by the Station would facilitate. The societal benefits of AIS and ASM are discussed in Section 1.3, above, and include maritime situational awareness, maritime safety and port security, among others. It is also in the public interest to facilitate the development of satellite-linked IoT transponder technology by permitting the reception of Myriota data at the Station.

3.2. Waiver of Default Processing Rules

The Commission has adopted a modified processing round procedure for NGSO-like space station applications,⁵⁸ because “NGSO systems generally cannot operate on the same spectrum without causing unacceptable interference to each other.”⁵⁹ KSAT requests a waiver of this default rule for its application to receive downlinked VHF Signals data from the Satellite at the Station, and requests that the Commission instead

generally grant such waivers ‘when there is little potential for interference into any service authorized under the Table of Frequency Allocations and when the non-conforming operator accepts any interference from authorized services.’”). See also *Orbcomm License Corp.*, *supra* note 29, ¶ 15 (“The Commission may grant a waiver of the Table of Allocations for non-conforming uses of spectrum when there is little potential for interference into any service authorized under the Table of Allocations.”).

⁵⁷ See, e.g., *Orbcomm License Corp.*, *supra* note 29, ¶ 15 (“Because Orbcomm will only receive existing AIS signals transmitted by maritime vessels, there is no risk of additional interference.”). See also *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, Notice of Proposed Rulemaking, IB Docket No. 12-267, FCC 12-117, ¶ 88 (rel. Sept. 28, 2012) (“Receive-only stations cannot cause interference, whether or not their antennas meet the [performance] standards in Sections 25.209(a) and (b).”).

⁵⁸ 47 C.F.R. § 25.137(c) (“A non-U.S. licensed NGSO-like satellite system seeking to serve the United States can be considered contemporaneously with other U.S. NGSO-like satellite systems pursuant to § 25.157 . . . if the non-U.S. licensed satellite system is: (1) In orbit and operating; (2) Has a license from another administration; or (3) Has been submitted for coordination to the [ITU].”).

⁵⁹ Amendment of the Commission’s Space Station Licensing Rules and Policies, First Report and Order, IB Docket No. 02-34, 18 FCC Rcd. 10760, 10773 ¶ 21 (2003) (“*First Space Station Licensing Reform Order*”). See also *Space Imaging Order*, *supra* note 24, at ¶ 3 (quoting *First Space Station Licensing Reform Order*).

Exhibit A – Narrative Supplement
FCC Form 312 – Modification Application for EV8
Applicant: Kongsberg Satellite Services AS
Call Sign: E160028

apply the first-come, first-served procedure used for GSO-like systems, as outlined in Section 25.158.⁶⁰

The Commission has said it is inclined to grant a waiver where there is “little potential for interference.”⁶¹ It has also stated that “it is in the public interest to adopt a first-come, first-served procedure for as many types of satellite applications as possible, except in circumstances where licensing the first applicant to operate in a certain frequency band would prevent other applicants from using that spectrum.”⁶² Licensing VHF Signals data reception at the Station in the 5167.5–5198.5 MHz band as proposed here would not preclude other parties from using the spectrum. As discussed in section 3.1, the proposed reception in this band will not cause interference nor require protection from interference. Moreover, granting KSAT’s waiver request and applying a first-come, first-served approach to KSAT’s application will ensure timely availability of critical VHF Signals data. Accordingly, the rationale for applying the default processing rule is not present here and the conditions for granting a waiver exist. Precedents for such waivers exist.⁶³

4. CONCLUSION

As demonstrated above, KSAT satisfies the legal and technical requirements and has made the necessary public interest showing under the Communications Act of 1934, as amended, and the Commission’s rules for obtaining the Commission’s grant of its request to add the Satellite as a point of communication for the Station.

⁶⁰ 47 C.F.R. § 25.158.

⁶¹ See contact MEO Communications, LLC, *supra* note 56.

⁶² *Space Imaging Order*, *supra* note 24, at ¶ 4; *First Space Station Licensing Reform Order*, *supra* note 59, at 10793 ¶ 74.

⁶³ See, e.g., *Space Imaging Order*, *supra* note 24. In the *Space Imaging Order*, the Commission agreed that because the proposed operation did not preclude other EESS systems in the same band, it was not necessary to subject Space Imaging to a modified processing round procedure and that public interest was supported by a first-come, first-served approach; thus, the Commission concluded that applying such an approach would, “exped[ite] service to the public.” *Id.*