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

Kongsberg Satellite Services AS ("**KSAT**") submits this narrative supplement to its application (FCC Form 312 Main Form, Schedule B and Schedule S) for authority to modify the license for its receive-only earth station in Fairbanks, Alaska (call sign E160028) ("**Station**"), SES-LIC-20160218-00154, granted February 14, 2017[1] ("**Station License**"). KSAT seeks to add an additional point of communication: a non-U.S. licensed (Canadian) space station. The Station will receive data transmissions from that space station 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. The narrative contains three main 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. 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 as a point of communication the Canadian-owned and licensed non-geostationary satellite called, Maritime Monitoring and Messaging Microsatellite ("M3MSat"), also known as exactView-7 ("EV7") ("**Satellite**").

---

[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) ("**Station License**").

### 1.2. The Proposed Service

The Station is a receive-only station located in Fairbanks, Alaska. It is intended to be used for data acquisition from the Satellite in the 5169.5000-5196.5000 MHz band (feeder links). This band is a subset of the band in which the Station is presently authorized to operate.[2] The Satellite operates in the mobile-satellite service ("**MSS**") and its primary mission is satellite-based Automatic Identification System ("**AIS**") signal reception from ship-based transponders; the Satellite will downlink AIS data to the receive-only station. In the future, the Satellite may also collect and downlink Application Specific Messaging ("ASM") signals. KSAT does not seek a license for the Satellite transmissions or Satellite reception. The Station already receives AIS data from another satellite in the exactView system, the EV1 satellite.

The Station will receive the signals from the Satellite during the "visible" portion of the Satellite's orbit. The Station will not be used for TT&C for the Satellite. The Station will not transmit. The Satellite is licensed by Canadian authorities: Radio License, File no. 3150-1 (695765 CP) (June 21, 2016) and Spectrum License, File no. 3150-1 (695769 CP) (June 21, 2016) ("**Canadian License**").[3]

The Station will be operated on a non-common carrier basis. KSAT is under contract to exactEarth, Ltd. of Ontario, Canada ("**exactEarth**") to operate the Station for AIS data acquisition from the Satellite, 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 earth station is in the public interest. It promotes the availability of and timely access to AIS data from the Satellite and complements the data currently being received from EV1. The data serves critical functions, including

---

[2] The Station presently receives communications from the Canadian EV1 satellite in the 5167.5000-5198.5000 MHz band and will continue to do so.

[3] Radio License, File no. 3150-1 (695765 CP) (June 21, 2016) and Spectrum License, File no. 3150-1 (695769 CP) (June 21, 2016) (**"Canadian License"**). *See* Exhibit C, Canadian Licenses. The Satellite operator states that the renewal of the Canadian License is in progress and KSAT will provide the Commission a copy once it is available.

maritime situational awareness, maritime safety, port security, search and rescue, and combating illegal, unreported and unregulated, or so-called "IUU," fishing.[4]

### 1.4. Applicant's Legal and Technical Qualifications

KSAT is a global leader in ground station operation 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 application,[5] for a more detailed discussion of KSAT's qualifications and ownership.

### 1.5. Earth Station Frequency Band

The earth station will acquire AIS data from the Satellite (via feeder links) in the following frequencies:[6]

| Center Freq. (MHz) | Lower Freq. (MHz) | Upper Freq. (MHz) | Bandwidth (MHz) | International Allocation | Domestic Allocation |
|---|---|---|---|---|---|
| 5183 | 5169.5 | 5196.5 | 27 | RR, fn. 5.447B | No; need waiver |

These frequencies are a subset of the currently authorized frequency band for reception at the Station (5167.5-5198.5 MHz).[7]

#### 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-

---

4 *See* United States of America Proposals for the Work of the Conference, WAC/081(27.08.14) (noting the benefits of AIS in preparing the U.S. proposal to the 2015 World Radio Conference for the creation of two additional AIS channels).

5 *Station License Application*, *supra* note 1, Exhibit A, Narrative Supplement.

6 Satellite operations are licensed by the Canadian ministry Innovation Science and Economic Development Canada ("**ISED**") to operate in this band: 5150–5250 MHz. *See Canadian License*, *supra* note 3, Radio License, ISED, File no. 3150-1 (695765 CP) (June 21, 2016). *See also* Exhibit C, Canadian Licenses. This band encompasses the band for which KSAT is requesting authorization from the Commission.

7 *Station License*, *supra* note 1.

geostationary-satellite systems in the mobile-satellite service and is subject to provisions of No. 9.11A."[8]

Footnote 5.447B applies here because: (i) The frequencies requested for use with EV7 (5169.5-5196.5 MHz) are within the band segment addressed by the footnote; (ii) the frequencies are used for feeder links; (iii) the Satellite is a non-geostationary satellite; and (iv) the Satellite is operating in the MSS bands as it is being used for satellite AIS signal collection in the 161.9625–161.9875 MHz (AIS-1) and 162.0125–162.0375 MHz (AIS-2) bands that are allocated for MSS.[9] The Satellite also includes a small LDR experimental payload receiving in the 399.9-400.05 MHz and 400.4657-400.6825 MHz bands, which are allocated for MSS. (See Section 2.2.2(d), below, for a detailed list of the Satellite's relevant operating frequencies.) The Satellite is currently undergoing international coordination at the International Telecommunication Union ("**ITU**") as required by ITU Radio Regulations No. 9.11A[10] and the Commission.[11] See **Exhibit B, Technical Supplement.**

Footnote 5.447C imposes certain additional ITU coordination requirements on operations that are subject to footnote 5.447B[12] and these requirements are satisfied. The

---

8 ITU Radio Regulations, art. 5, note No. 5.447B. *See* ITU Radio Regulations, No. 9.11A (coordination required if a footnote requires it).

9 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.").

10 *See* ITU RR 9.11A ("[F]or a station for which the requirement to coordinate is included in a footnote to the Table of Frequency Allocations referring to this provision, the provisions of Nos. 9.12 to 9.16 are applicable"). The Satellite operation has been notified to the ITU Radiocommunication Bureau under International Radio Regulations, Article 11.2. *See* ITU, BR IFIC 2795 (May 26, 2015) (regarding publication under Part I-S).

11 *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 the Commission's procedures under which a "non-U.S. satellite operator [may] seek[] immediate access to the U.S. market through an in-orbit satellite" with the prerequisite that the operator "has initiated international coordination negotiations for that satellite network pursuant to the [ITU's] international Radio Regulations . . . .").

12 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

power flux-density requirements in footnote 5.447B[13] will be observed as they are stated also in the licenses issued by Innovation, Science and Economic Development Canada ("**ISED**") for the Satellite. ISED has imposed these requirements on the Satellite operator by making them conditions of the Canadian License.[14] See **Exhibit C, Canadian Licenses**.

### 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.[15] Accordingly, KSAT requests a waiver of the Commission's rules for feeder link reception in the 5150–5216 MHz band. As explained further in Section 3 below, a waiver is warranted here since the operation of the earth station conforms to the International Radio Regulations and will be operated on a non-interference basis; nor does KSAT request protection from interference. The downlink serves the public interest by providing timely access to AIS data.

### 1.5.3. Coordination with Federal Users

The 5150-5250 MHz band is also allocated domestically to aeronautical radionavigation on a primary basis for federal uses. KSAT respectfully requests the Commission's

---

protection from, and shall not cause harmful interference to, stations of the fixed-satellite service operated under No. . . . 5.447B."

13 *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.").

14 *See Canadian License*, *supra* note 3, Radio License, Attachment A ¶ 15 (June 21, 2016) ("In the band 5150-5216 MHz (space to Earth), the power flux-density at the Earth's surface produced by space stations operating in the space-to-Earth direction shall not exceed -164 dB(W/m2) in any 4 kHz band for all angles of arrival.").

15 47 C.F.R. § 2.106, containing the U.S. Table of Frequency Allocations, which in pertinent part provides:

| Table of Frequency Allocations | | 4990-5925 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<br>AERONAUTICAL RADIONAVIGATION<br>FIXED-SATELLITE (Earth-to-space) 5.447A<br>MOBILE except aeronautical mobile 5.446A 5.446B<br><br>5.446 5.446C 5.447 5.447B 5.447C | | | 5150-5250<br>AERONAUTICAL RADIONAVIGATION US260<br><br><br>US211 US307 US344 | 5150-5250<br>AERONAUTICAL RADIONAVIGATION US260<br>FIXED-SATELLITE (Earth-to-space) 5.447A US344<br><br>5.447C US211 US307 | RF Devices (15)<br>Satellite Communications (25)<br>Aviation (87) |

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 are no modifications to the existing Station equipment.

#### 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 Ed Greife, phone number (907) 451-9841. 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, which was launched on June 22, 2016, is operating in accordance with the Canadian License and is being used for AIS data collection in the following bands: 161.9625–161.9875 MHz (AIS-1) and 162.0125–162.0375 MHz (AIS-2). In the future, the

Satellite may also collect and downlink to the Station data from ASM[16] signals it receives in the 161.9375–161.9625 MHz (ASM-1) and 161.9875–162.0125 MHz (ASM-2) bands. The Satellite is owned by the Canadian Department of National Defence. exactEarth Ltd., of Ontario, Canada is responsible for the AIS payload mission, including data acquisition, pursuant to a license agreement with the Department of National Defence. Under that agreement, exactEarth is the payload operator with rights to acquire data and distribute AIS data products in exchange for supplying a data feed to the department. The Department of National Defence has contracted with the Canadian Space Agency to operate the Satellite, including TT&C. exactEarth in turn has a service level agreement with the Canadian Space Agency. See Section 2.3 for additional information on the Satellite. The Satellite is operated under licenses issued by the Canadian government.[17]

The Satellite will downlink AIS data (received from marine vessels in the mobile-satellite service) to the Station using the 5169.5–5196.5 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 in Canada).

## 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 the exactEarth Satellite using the Station.

### 2.2.1. Competitive Aspects

In the *DISCO II Order*,[18] the Commission adopted a rebuttable presumption in favor of U.S. market entry for non-U.S. licensed satellites authorized by WTO member

---

16 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 in 2019. *See* ITU 2016 Radio Regulations, Appx. 18, Specific Note z.

17 *See supra* note 3.

18 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 11 at ¶ 1.

countries.[19] Canada, the authorizing authority for the Satellite, is a WTO member.[20] Second, MSS is covered under the WTO Basic Telecommunications Agreement as a Basic Telecommunications Service,[21] and satellite-based reception of AIS signals from ships is a form of MSS.[22] Accordingly, the DISCO II rebuttable presumption in favor of market entry applies. As shown in section 1.3, above, downlinking AIS data is in the public interest. Satellite AIS authorizations have also been granted to several U.S. entities by the Commission.[23]

### 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.[24] The Satellite will downlink AIS data to the Station in the 5169.5–5196.5 MHz band.

As shown in Section 1.5.1, above, the 5150–5216 MHz band (which encompasses the frequencies for the Satellite) 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 use. As demonstrated in Section 3, below, a waiver is justified based on Commission's rules and precedent.

---

19 *See* 47 C.F.R. § 25.137(a)(2). *See also DISCO II Order*, *supra* note 18, ¶ 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).

20 *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 May 17, 2017).

21 *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).

22 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.").

23 *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).

24 *See DISCO II Order*, *supra* note 18, ¶¶ 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.").

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, a notification of the Satellite operation has been submitted to the ITU Radiocommunication Bureau in accordance with International Radio Regulations, Article 11.2[25] (see Exhibit B, Technical Supplement). 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). Third, the proposed reception from the Satellite is substantially similar to the current reception from the EV1 satellite (EV7 has an identical downlink antenna design to EV1); exactEarth previously coordinated the downlink for the EV1 satellite[26] in these frequencies with Globalstar, the only known licensee using the 5150–5250 MHz band in the state of Alaska.

#### 2.2.3. National Security and Foreign Policy Issues

Granting this earth station application to operate with the exactEarth Satellite, authorized by the Canadian 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, including to the U.S. Coast Guard and the National Oceanic and Atmospheric Administration. 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 is responsible for the AIS payload mission, including data acquisition. The Satellite is owned by the Canadian Department of National Defence and the Canadian Space Agency performs TT&C. exactEarth is responsible for the AIS payload mission, including the Satellite data downlink,

---

[25] *See* ITU, BR IFIC 2795 (IFIC date May 26, 2015) (regarding publication under Part I-S). Although the DATAD beam (5183 MHz center frequency) for the downlink to the Station was published in Part III of BR IFIC 2840 (Mar. 7, 2017), the Satellite operator continues to pursue ITU coordination and believes the problem has been resolved.

[26] *See Station License Application*, *supra* note 1, Exhibit B, Technical Supplement.

pursuant to agreements with the Department of National Defense and the Canadian Space Agency.[28]

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

(a) *exactEarth Address and Telephone Number*.[29] 260 Holiday Inn Drive, Unit 30, Building B, Cambridge, ON N3C 4E8, Canada; tel. +1 519-622-4445.

(b) *Regulatory Status*.[30] The Satellite is operated on a non-common carrier basis.[31]

(c) *Basic Qualifications*.[32] 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 July 5, 2017, Hisdesat Servicios Estrategicos S.A. of Madrid, Spain held 27% of exactEarth's outstanding common stock; it is the only entity holding 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*.[33] The Satellite is authorized by the government of Canada (see note 3 above), which is the ITU coordinating administration responsible for the exactEarth Satellite's operations.

(e) *Public Interest Considerations*.[34] Public interest considerations supporting grant of this applications are set forth in section 1.3, above.

(f) *Milestones, Bond and Related Requirements*.[35] The Satellite, which was launched on June 22, 2016, is operating as authorized under the Canadian License. Thus, this

---

28 *See supra* sec. 2.1, above.
29 *See* FCC Form 312, Questions 1-8.
30 *See* FCC Form 312, Question 21; 47 C.F.R. § 25.114(c)(11).
31 47 U.S.C. § 153(11).
32 *See* FCC Form 312, Questions 36-41.
33 *See* FCC Form 312, Question 42b.
34 *See* 47 C.F.R. § 25.114(d)(6).
35 *See* 47 C.F.R. § 25.137(d).

application does not raise any issues regarding milestones or posting of bonds under section 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 is a small non-geostationary satellite whose mission is AIS data collection. The Satellite also includes two small experimental payloads for the Canadian government,[36] one of which is no longer in use and neither of which involve the Station.

*(b)* *Lifetime (§ 25.114(c)(10))*. The Satellite was launched by an Indian Polar Satellite Launch Vehicle from the Satish Dhawan Space Centre in Sriharikota, India on June 22, 2016. The Satellite has a design life of 5 years.

*(c)* *Satellite orbit information (§ 25.114(c)(6))*. The Satellite is a non-geostationary satellite. 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;[37] (viii) right ascension of the ascending node, and (ix) for each satellite in each orbital plane, the initial phase angle at the reference time.[38]

---

[36] The two experimental payloads are a Low Data Rate (LDR) radio experiment, and a device called the Deep-Dielectric Charging Monitor (DDCM). The LDR experimental payload operated in the MSS (399.9-400.05 MHz and 400.15-401.00 MHz) to demonstrate two-way, low data rate communication between itself and a dedicated ground terminal (not the Station). The LDR demonstration occurred during the LEOP/commissioning phase and will not be used for the remainder of the mission. The DDCM experiment is for observing spacecraft charging and material behavior (using the same MSS bands) and will not use the Station for downlinking data.

[37] Not applicable to the Satellite (*see* Exhibit B, Technical Supplement, sec. 4).

[38] Not applicable to the Satellite.

(d) *Frequencies (§ 25.114(c)(4), § 25.114(c)(7))*. The Satellite is authorized to operate pursuant to its Canadian License in the following frequency bands (only relevant bands are listed[39]):

| Frequency Bands (MHz) | Usage Description | International Allocation | 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 |
| 5150-5250 MHz (space to Earth) | Downlink AIS data | Yes | No |

The last row is particularly relevant to this application, as it is the band the Satellite is authorized to use to downlink to the Station; the portion of the band that will be used with the Station is 5169.5–5196.5 MHz (KSAT seeks authorization to receive in this band). 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 other frequencies.

(e) *Power Flux Density Levels (§ 25.114(c)(8))*. The power flux-density requirements in footnote 5.447B[40] will be observed as they are a requirement of the Canadian License.[41]

(f) *Tracking, Telemetry and Control Arrangements (§ 25.172)*. TT&C for operations of the Satellite is handled by Canadian Space Agency's ground station at Shirley's Bay, Ottawa, Ontario. No TT&C operations for the Satellite will be conducted in the United States.

(g) *Physical Characteristics of the Space Station*. The Satellite is a small (0.60 x 0.60 x 0.85 meter) non-geostationary satellite built by Honeywell Canada (formerly COM DEV International Ltd. of Ontario, Canada). The Satellite weighs 85 kg. The predicted end-of-life power is 66 W. The Satellite does not have propulsion. See Exhibit B, Technical Supplement for additional details. The orbit is 520 km x 486 km (as of February 21, 2017).

---

[39] *See* Exhibit C, Canadian Licenses for a complete list of the Satellite's authorized frequencies.

[40] *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.").

[41] *Supra* note 3.

*(h)* *Coordination Considerations*. The Satellite frequencies, including 5169.5–5196.5 MHz and the AIS frequencies conform to the International Table of Frequency Allocations as described in Section 1.5.1, above and have been submitted to the ITU Radiocommunication Bureau for notification under International Radio Regulations, Article 11.2.[42] See Exhibit B, Technical Supplement for the ITU registration information. The Satellite will be operated on a non-interference basis.

*(i)* *Orbital Debris (§ 25.114(d)(14))*. The Satellite operation and post mission disposal plans[43] are consistent with the Commission's rules and guidelines.[44] Please see Exhibit D, Orbital Debris Mitigation Statement. The statement is prepared by KSAT in conjunction with its customer, exactEarth, the satellite owner, in accordance with 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: For non-conforming domestic frequency use; and 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.[45] In general, a waiver is appropriate if: (i) Special circumstances warrant a deviation from

---

[42] *See* ITU, BR IFIC 2795 (May 26, 2015) (regarding publication under Part I-S). Although the DATAD beam (5183 MHz center frequency) for the downlink to the Station was published in Part III of BR IFIC 2840 (Mar. 7, 2017), the Satellite operator continues to pursue ITU coordination and believes the problem has been resolved.

[43] The Canadian License for the Satellite requires post-mission disposal as follows: "The licensee, at the end-of-life of the satellite, must implement space debris mitigation measures in accordance with best industry practices so as to minimize adverse effects on the orbital environment." *See* Canadian License, Conditions for Approval, sec. 21.

[44] 47 C.F.R. § 25.114(d)(14)(v) (requiring "[a] description of the design and operational strategies that will be used to mitigate orbital debris . . . ."). *See generally In the Matter of Mitigation of Orbital Debris*, FCC, Second Report & Order, FCC 04-130, IB Docket No. 02-54 (rel. June 21, 2004).

[45] *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).

the general rule; and (ii) such deviation would better serve the public interest than would strict adherence to the general rule.[46] 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 interest.[47] KSAT submits that good cause exists for the Commission to waive its rules in this case, as explained below.

### 3.1. Waiver for Nonconforming Use of Frequencies

As explained in section 1.5.1, above, the 5150–5216 MHz band – which includes the proposed downlink band to the Station (5169.5–5196.5 MHz) – has been allocated internationally for non-geostationary MSS feeder links through footnote 5.447B. The band is available because the feeder link will be used here to download MSS data from the AIS payloads. No such allocation exists in the Domestic Table of Frequency Allocations.[48] Accordingly, KSAT requests a waiver of Section 2.102[49] and 2.106[50] 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 reception at the Station has no potential for causing interference. The downlink from the Satellite will not cause interference because (i) the use of this band has been authorized by the Canadian government and notified to the ITU;[51] (ii) exactEarth already coordinated the downlink to the Station in this band for the EV1 satellite with Globalstar, the only other licensee found to be operating in the 5150–5250 MHz band in Alaska (the EV7 downlink has substantially similar characteristics); and (iii) the operation complies with the power flux-density limits imposed by footnote 5.447B of the ITU Radio Regulations. 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), which is to prevent harmful interference, would not be undermined, since no interference would result from this use.

---

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

47 *WAIT Radio*, 418 F.2d at 1157.

48 *See supra* note 15 and accompanying text.

49 47 C.F.R. § 2.102(a) (requiring compliance with the U.S. Table of Frequency Allocations in 47 C.F.R. § 2.106).

50 47 C.F.R. § 2.106 (containing the U.S. Table of Frequency Allocations).

51 *See* ITU, BR IFIC 2795 (May 26, 2015) (regarding publication under Part I-S).

The Commission has stated that it is inclined to grant waivers where there is "little potential for interference.[52] The Commission has stated repeatedly that where a station is merely receiving existing signals, as is the case here, there is no risk of additional interference.[53] KSAT does not seek protection from interference.

Second, the public interest is served by increasing the availability and timeliness of AIS data, which reception by the Station would facilitate. The societal benefits of AIS are discussed in Section 1.3, above, and include maritime situational awareness, maritime safety and port security, among others.

### 3.2. Waiver of Default Processing Rules

The Commission has adopted a modified processing round procedure for NGSO-like space station applications,[54] because "NGSO systems generally cannot operate on the same spectrum without causing unacceptable interference to each other."[55] KSAT requests a waiver of this default rule for its application to receive downlinked AIS data from the Satellite at the Station, and requests that the Commission instead apply the

---

[52] 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 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 23, ¶ 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.").

[53] *See, e.g.*, Orbcomm License Corp., *supra* note 23, ¶ 15 ("Because Orbcomm will only receive existing AIS signals transmitted by maritime vessels, there is no risk of additional interference."). *See, e.g.*, 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).").

[54] 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].").

[55] 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*, at ¶ 3 (quoting *First Space Station Licensing Reform Order*).

first-come, first-served procedure used for GSO-like systems, as outlined in Section 25.158.[56]

The Commission has said it is inclined to grant a waiver where there is "little potential for interference."[57] 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."[58] Licensing AIS data reception at the Station in the 5169.5–5196.5 MHz band as proposed here would not preclude other parties from using the spectrum. As discussed in section 3.1, the proposed downlink will neither 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 will promote timely availability of critical AIS 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.[59]

## 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.

---

56 47 C.F.R. § 25.158.

57 *See* contactMEO Communications, LLC, *supra* note 52.

58 *Space Imaging Order*, *supra* note 55, at ¶ 4; *First Space Station Licensing Reform Order*, *supra* note 55, at 10793 ¶ 74.

59 *See, e.g., Space Imaging Order*, *supra* note 55. 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.*