

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

In the Matter of

Application of Panasonic Avionics Corporation to Modify its Earth Stations Aboard Aircraft (“ESAA”) Blanket License)	Call Sign E100089
)	File No. SES-MOD-

MODIFICATION APPLICATION

By this application, Panasonic Avionics Corporation (“Panasonic”) seeks to modify its existing earth stations aboard aircraft (“ESAA”) blanket license, Call Sign E100089,¹ by adding new satellite points of communication for its previously licensed ESAA terminals. The modifications sought herein will enhance Panasonic’s ability to provide next-generation, in-flight broadband connectivity services to U.S. airlines and their passengers and crew.

Pursuant to Section 25.117(c) of the Commission’s rules,² Panasonic includes an FCC Form 312 Schedule B and Technical Appendix to provide the required technical information pertaining to the proposed modification. The remaining information submitted in support of its *ESAA Blanket License* has not changed.

I. BACKGROUND

Panasonic provides advanced aeronautical broadband satellite services that enable in-flight communications connectivity to passengers and crew using state-of-the-art ESAA terminals

¹ See Panasonic Avionics Corporation, File No. SES-LIC-20100805-00992, Call Sign E100089, and subsequent filings and modifications (“*ESAA Blanket License*”); Panasonic Avionics Corporation Application for Authority to Operate Up to 50 Technically Identical Aeronautical Mobile-Satellite Service Aircraft Earth Stations in the 14.0-14.4 GHz and 11.7-12.2 GHz Frequency Bands, Order and Authorization, DA 11-1480 (rel. Aug. 31, 2011).

² 47 C.F.R. § 25.117(c).

and a global network of U.S. and foreign satellites and gateway earth stations (the “eXConnect System”). Panasonic has fully described the eXConnect System in prior submissions and hereby incorporates by reference the technical showing regarding the control functionality and other operational characteristics submitted in connection with prior applications.³

Panasonic’s *ESAA Blanket License*, which supports its global ESAA operations on U.S.-registered aircraft (and non-U.S.-registered aircraft traversing U.S. airspace), must be regularly modified to reflect adjustments to Panasonic’s global network resulting from technological developments and changes in customer demand. For example, the *ESAA Blanket License* was modified to add satellite points of communication for its previously licensed Single Panel Antenna (“SPA”) and Panasonic Phased Array (“PPA”) antenna, and to add the TECOM Ku-Stream 1000 (“TECOM”) terminal.⁴ It was most recently modified (i) to add six new satellites as authorized points of communication for its ESAA terminals, (ii) to operate the ESAA terminals with certain previously authorized satellite points of communication at higher power levels, and (iii) to make certain administrative changes in the ESAA Blanket License.⁵

The license modifications proposed herein — ESAA communications with new satellite points of communication — are consistent with the coordinated parameters of the proposed satellites and the Commission’s rules and policies governing Ku-band ESAAs.⁶ Further, the

³ *Supra* n.1.

⁴ *See* Panasonic Avionics Corporation, File No. SES-MFS-20170312-00255, Call Sign E100089 (granted on July 26, 2017).

⁵ *See* Panasonic Avionics Corporation, File No. SES-MFS-20180122-00052, Call Sign E100089 (granted on August 1, 2018).

⁶ *See* 47 C.F.R. § 25.227; *see also* *Revisions to Parts 2 and 25 of the Commission’s Rules to Govern the Use of Earth Stations Aboard Aircraft Communicating with Fixed-Satellite Service Geostationary-Orbit Space Stations Operating in the 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz and 14.0-14.5 GHz Frequency Bands; Service Rules and Procedures to Govern the Use of Aeronautical Mobile Satellite Service Earth Stations in Frequency Bands Allocated to the Fixed Satellite Service*, IB Docket Nos. 12-

modifications will allow Panasonic to optimize its ESAA operations and the eXConnect System by utilizing additional, advanced satellite capacity to support its operations.

II. DISCUSSION

Panasonic hereby seeks to modify its *ESAA Blanket License* to add six (6) new satellites as authorized points of communication for its ESAA terminals, as described below.

A. Proposed New Satellite Points of Communication

The following table provides an overview of the basic parameters of ESAA operations with each individual satellite point of communication. Each satellite is licensed by a member country of the World Trade Organization (“WTO”) for services covered under the WTO Basic Telecommunications Agreement.⁷ A complete table reflecting all satellites in the eXConnect System is included in the Technical Appendix. Panasonic seeks to operate each satellite in Table 1 with the SPA and PPA ESAA terminals only.

376 & 05-20, Notice of Proposed Rulemaking and Report and Order, FCC 12- 161 (rel. Dec. 28, 2012) (“*ESAA Order*”).

⁷ See 47 C.F.R. § 25.137(a)(2); see also *Amendment of the Commission’s Regulatory Policies to Allow Non-U.S. Licensed satellites Providing Domestic and International Service in the United States*, Report and Order, IB Docket No. 96-111, 12 FCC Rcd 24094, ¶ 39 (1997) (“We adopt our proposal to apply a presumption in favor of entry in considering applications to access non-U.S. satellites licensed by WTO members to provide services covered by the U.S. commitments under the WTO Basic Telecom Agreement.”); *Id.*, ¶ 64 (“[W]e will not evaluate the effective competitive opportunities in the route market for non-U.S. satellites licensed by a WTO Member providing WTO covered services. Thus, we will not perform an ECO-Sat test on any route, whether a WTO route market or a non-WTO route market.”).

Table 1 - Proposed Satellite Points of Communication⁸

Satellite	Licensing Admin.	Orbital Location	Downlink Freq. (GHz) ⁹	ITU Region	Serves U.S. ¹⁰	ITU Satellite Network
Apstar 6C	China	134° E	12.25-12.75	3	No	G4SAT-134E
Apstar 6D ¹¹	China	134° E	10.7-12.75	3	No	APSTAR-2, CHINASAT-134E, G4SAT-134E
AsiaSat 9	China	122° E	10.95-11.2 11.45-11.7 12.25-12.75	3	No	ASIASAT-AKX
ChinaSat 10	China	110.5° E	12.25-12.75	3	No	CHINASAT-2, CHINASAT-6, DFH-3A-OB
SES-12	Netherlands	95° E	10.7-11.45	3	No	NSS-G2-18
SES-14	Brazil & Netherlands ¹²	47.5° W	10.95-11.2; 11.45-12.45	2	No	B-SAT-1 W-2; NSS-BSS 47.5W ¹³

Panasonic seeks to communicate with each new satellite point of communication at off-axis ESD levels currently authorized in the *ESAA Blanket License* (but great than the off-axis ESD levels specified in Section 25.227(a)(1) of the Commission’s rules).¹⁴ Accordingly, Panasonic

⁸ The ESAA terminals will operate in the uplink direction within the 14.0-14.5 GHz band consistent with satellite coordination agreements, the Commission’s rules, and applicable international requirements.

⁹ Operations in the 10.7-10.95 and 11.2-11.45 GHz bands outside the United States are consistent with footnote NG52 of the U.S. Table of Allocations (limiting the use of these bands by GSO FSS satellites to international systems). *See* 47 C.F.R. § 2.106, fn. NG52.

¹⁰ “No” indicates that Panasonic’s operations will be conducted outside U.S. territory, even if the satellite may have some coverage of the United States.

¹¹ Although Apstar 6D will not be launched until 2019, Panasonic seeks to add the satellite as new point of communication in this modification application. Required information regarding the satellite’s operational characteristics is included herein.

¹² SES-14 operates in the 10.95-11.2 GHz, 11.45-12.2 GHz and 14.0-14.5 GHz frequency bands under ITU filings submitted by Brazil (ITU Network: B-SAT-1 W-2), and in the 12.2-12.45 GHz band under ITU filings submitted by the Netherlands (ITU Network: NSS-BSS 47.5W).

¹³ SES-14 is included on the Commission’s Permitted Space Station List (“Permitted List”) (*see* SES DTH do Brasil Ltda, File No. [SAT-PPL-20160918-00093](#), Call Sign S2974). However, Panasonic seeks to communicate with the satellite at power levels in excess of two-degree spacing levels. *See* FCC Form 312 Schedule B.

¹⁴ *See* 47 C.F.R. § 25.227(a)(1).

seeks ESAA operating authority with these satellites pursuant to Section 25.227(a)(2)¹⁵ of the Commission's rules and provides information regarding the operational characteristics of the ESAA terminals in Form 312 Schedule B, as necessary.

Panasonic incorporates by reference the performance information and off-axis ESD data previously submitted for the SPA and PPA.¹⁶ In addition, each satellite operator has reviewed the technical characteristics of the proposed ESAA operations and confirmed they are consistent with its coordination agreements and that such operations will not result in unacceptable interference to other satellites within +/- 6 degrees of the subject satellites.¹⁷

Consistent with Commission precedent, Panasonic is not submitting a full U.S. market access showing under Section 25.137(d) of the Commission's rules because none of the satellites in Table 1 will provide service to or from U.S. territory.¹⁸ In support of its request to operate the PPA and SPA ESAA terminals with satellites in Table 1, Panasonic provides the attached Technical Appendix, which includes an orbital debris mitigation statement, coverage maps and link budgets for each satellite.

Additionally, each satellite operator provided Panasonic with an orbital debris mitigation statement and satellite end-of-life information, submitted herein. Although some of the statements

¹⁵ See 47 C.F.R. § 25.227(a)(2).

¹⁶ See Panasonic Avionics Corporation, File No. SES-MFS-20120913-00818, Call Sign E100089 at Technical Appendix (providing off-axis ESD plots for the PPA terminal) and File No. SES-MFS-20160819-00730, Call Sign E100089 at Technical Appendix (providing off-axis ESD plots for the SPA terminal).

¹⁷ See Technical Appendix.

¹⁸ See 47 C.F.R. § 25.137(d); FCC letter to LMI Advisors, November 12, 2015, Re: Panasonic Avionics Corporation IBFS File Nos. SES-MFS-20150609-00349, SES-AFS-20150820-00558, Call Sign:E100089 ("We view the proposed operations as a request for access to the United States market by a non-U.S.-licensed space station. Accordingly, Panasonic must provide the Commission requirements for a U.S.-licensed system operating in the United States, including, but not limited to, an FCC Form 312 Schedule S"); and *e.g.*, AC BidCo LLC, File No. SES-MFS-20151022-00735, Call Sign E120106.

appear in a different format, they all describe their debris mitigation and satellite end-of-life disposal as required by Section 25.114(d)(14). Panasonic has requested a waiver of Commission requirements associated with the Apstar 6C satellite’s inability to vent stored energy at end-of-life and, to the extent necessary, respectfully reserves the right to supplement the debris mitigation showings included in this application.

B. Ground Segment

The gateway earth stations associated with the proposed satellite points of communication are identified in Table 2, below.

Table 2. Gateway Earth Stations Table

Satellite	Satellite Operator	Gateway Earth Station Location	Country	Gateway Operator	FCC Call Sign
Apstar 6C	APT Satellite Company Limited	Beijing	China	China Telecom Satellite	N/A
Apstar 6D	APT Satellite Company Limited	Hong Kong	China	Speedcast	N/A
AsiaSat 9	Asia Satellite Telecom Co.	Hong Kong	China	China Telecom Satellite	N/A
ChinaSat 10	China Satellite Comms.	Beijing	China	China Satcom	N/A
SES-12	SES	Adelaide	China	China Satcom	N/A
SES-14	SES	Mount Airy, MD	U.S.	SES Americom	E050287
SES-14	SES	Port St. Lucie	U.S.	United Teleports	E160081

Network control and monitoring of the earth stations and the eXConnect System will continue to be provided by the Panasonic Customer Performance Center (“CPC”) in Lake Forest, California, on a 24/7 basis. The CPC makes use of a network management system (“NMS”) to provide complete control and visibility to all components the eXConnect System. The NMS system has the capability of shutting down any component in the system that is malfunctioning. The primary points of contact at Panasonic’s CPC facility are provided below and in the FCC Form 312, Schedule B.

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C. Non-Conforming ESAA Receive Operations

The FCC’s Table of Allocations permits use of the 10.95-11.2 GHz and 11.45-11.7 GHz (space-to-Earth) bands on an unprotected basis, and the 11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space) bands on a primary basis for ESAA operations.¹⁹ In this application, and as described in Table 1, the new satellites support operations in all of the ESAA bands, as well as in the 10.7-10.95 GHz, 11.2-11.45 GHz, 12.2-12.75 GHz downlink bands. Panasonic seeks to utilize this additional downlink capacity on an unprotected, non-harmful interference basis outside the United States. All new satellite points of communication operate consistent with ITU regulations, there is no potential for interference from the proposed ESAA receive operations, and

¹⁹ See 47 C.F.R. § 2.106 and n. NG52 and NG55; 47 C.F.R. § 25.227. Moreover, in the 10.7-10.95 GHz band, Panasonic will limit its ESAA receive operations to outside of the United States consistent with the Table of Allocations (*see* 47 C.F.R. § 2.106, fn. NG52).

use of the additional downlink spectrum is essential to Panasonic's in-flight broadband connectivity offering.

In light of the Commission's current practice and given that its ESAA receive operations present a negligible risk of interference to other spectrum users, Panasonic requests that the Commission permit ESAA operations in the 10.7-10.95 GHz, 11.2-11.45 GHz, 12.2-12.75 GHz consistent with its current approach of granting authority to operate ESAA terminals outside the United States on a non-conforming, non-interference basis.

D. Waiver Request

Panasonic respectfully requests a waiver of Sections 25.114(d)(14)(ii) and Section 25.283(c) of the Commission's rules for the APSTAR 6C satellite.

The Commission may waive a rule for good cause shown. Waiver is appropriate if special circumstances warrant a deviation from the general rule and such deviation would better serve the public interest than would strict adherence to the general rule. Generally, the Commission may 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 would otherwise serve the public interest.²⁰

As discussed below, grant of the requested waiver is consistent with Commission precedent and will serve the public interest.

Sections 25.114(d)(14)(ii) and 25.283(c) address requirements relating to venting stored energy sources at the spacecraft's end of life.²¹ APSTAR 6C is a Spacebus SB4000C2 model spacecraft operated by APT Satellite Company Limited ("APT") and was launched on May 3, 2018. As described in more detail in the attached Technical Appendix, the Spacebus SB4000C2 has three (3) helium tanks that were sealed following completion of the launch phase. The tanks

²⁰ PanAmSat Licensee Corp., 17 FCC Rcd 10483, 10492 (Sat. Div. 2002) (footnotes omitted)

²¹ Section 25.283(c) contains the substantive venting requirement, and Section 25.114(d)(14)(ii) requires applicants to submit information that addresses "whether stored energy will be removed at the spacecraft's end of life." 47 C.F.R. § 25.114(d)(14)(ii).

cannot be reopened and will have residual helium at a pressure of 6MPa until APSTAR 6C's end-of-life.²² Accordingly, Panasonic requests a waiver of §25.283 of the Commission's rules with respect to the remaining helium.

In a number of cases involving various spacecraft models, the Commission has waived Section 25.283(c) to permit launch and operation of spacecraft that do not allow for full venting of pressure vessels at end of life, based on a finding that modifying the space station design at a late stage of construction would pose an undue hardship.²³ The same practical obstacle is present here: because APSTAR 6C is already in orbit, APT can do nothing to enable full venting of residual pressure in the oxidizer tanks. Under these circumstances, a waiver of Sections 25.114(d)(14)(ii) and 25.283(c) is warranted.

E. Public Interest Statement

Grant of the requested modification will serve the public interest by extending the coverage, increasing the capacity, and improving the operational capabilities of the eXConnect System. This will provide a direct benefit to U.S. consumers who will be able to access improved in-flight broadband applications and will further enhance competition and U.S. leadership in

²² The existence of the residual helium is a result of the satellite design – isolating the helium tanks after orbit-raising is necessary for reducing the risks associated with valves between these tanks and pressurized fuel/oxidizer tanks during the long operating life. Also note that the residual helium is inert, posing no risk of chemical energy release, and the remaining helium pressure is far below tanks' qualified pressure tolerance at 30MPa.

²³ See, e.g., *DIRECTV Enterprises LLC*, File No. SAT-LOA-20090807-00086, Call Sign S2797, grant-stamped Dec. 15, 2009, Attachment at ¶ 4 (granting a partial waiver of Section 25.283(c) for DIRECTV 12, a Boeing 702 model spacecraft, on grounds that requiring modification of satellite would present an undue hardship); *PanAmSat Licensee Corp.*, File Nos. SAT-MOD-20070207-00027, SAT-AMD-20070716-00102, Call Sign S2237, grant-stamped Oct. 4, 2007, Attachment at ¶ 7 (granting a partial waiver of Section 25.283(c) for Intelsat 11 on grounds of undue hardship); *EchoStar Satellite Operating Corp.*, File No. SAT-LOA-20071221-00183, Call Sign S2746, grant-stamped Mar. 12, 2008, Attachment at ¶ 4 (granting a partial waiver of Section 25.283(c) for AMC-14, a Lockheed Martin A2100 model spacecraft, on grounds that requiring modification of satellite would present an undue hardship).

aeronautical broadband services. All of these benefits will be achieved consistent with the Commission's rules and policies for ESAA operations.

III. CONCLUSION

Based on the foregoing, Panasonic respectfully requests that the Commission grant its request to modify its *ESAA Blanket License*, Call Sign E100089, by adding new satellite points of communication for its previously licensed PPA and SPA ESAA terminals.