Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of

Application of Panasonic Avionics Corporation to Modify its Existing Ku-band Earth Stations Aboard Aircraft ("ESAA") Blanket License	))))	Call Sign E100089 File No. _____

APPLICATION TO MODIFY EXISTING ESAA BLANKET LICENSE

By this application, Panasonic Avionics Corporation ("Panasonic") seeks modification of its existing earth stations aboard aircraft ("ESAA") blanket license, Call Sign E100089, by adding authority to operate 1,000 of its next-generation Single-Panel Antenna ("SPA") terminals onboard U.S.-registered aircraft and onboard foreign-registered aircraft while present in U.S. airspace.[1] Panasonic also seeks to add the Telstar 12 Vantage ("Telstar 12V") satellite as an authorized point of communication for its authorized ESAA terminals. Finally, Panasonic requests that the Commission remove a certain condition in its license which, due to changes in Commission policies, is no longer necessary or appropriate.

The SPA terminal, which is fully certified for operation on the subject commercial aircraft, is a single-panel variant of the previously licensed Panasonic Phased Array ("PPA") terminal that will operate in accordance with the terms of the *Panasonic Order*, the *ESAA Blanket License*, and Section 25.227 of the Commission's Rules, 47 C.F.R. § 25.227, governing

[1] *See* Panasonic Avionics Corporation, Radio Station Authorization, Call Sign E100089, File No. SES-MFS-20150609-00349 and other associated file numbers ("*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) ("*Panasonic Order*").

ESAA operations. In addition, proposed operations with the Telstar 12V satellite will enhance the in-flight broadband connectivity services available to U.S. passengers flying within the relevant service area of the satellite. As discussed herein, grant of this modification application is consistent with Commission precedent and will strongly serve the public interest.

I. BACKGROUND

Panasonic is the world leader of in-flight entertainment and connectivity ("IFEC") systems and services. Panasonic operates the Ku-band eXConnect System as part of Panasonic's Global Communication Suite ("GCS") to enable U.S. and foreign airlines to provide broadband connectivity to passengers and crew on both short-haul domestic and long-haul international routes. In this application, Panasonic seeks authority to operate its next-generation SPA terminal with the eXConnect System, and add the Telstar 12V satellite as an authorized point of communication.

Panasonic's *ESAA Blanket License* was the subject of a recent modification application to add certain satellite points of communication for its previously licensed PPA terminal, which was granted on June 30, 2016.[2] During the pendency of that earlier application, Panasonic requested and received special temporary authorization ("STA") for limited SPA operations to communicate with certain U.S.-licensed satellites.[3] The instant application serves as Panasonic's request for long-term authority to operate the SPA terminal and access the Telstar 12V satellite under its *ESAA Blanket License*.

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[2] *See* Panasonic Avionics Corporation, File Nos. SES-MFS-20150609-00349, SES-AFS-20150820-00538 & SES-AFS-20160107-00003 (Call Sign E100089).

[3] *See* Panasonic Avionics Corporation, File No. SES-STA-20160218-00142 ("*60-day STA*") (expired on April 28, 2016) and File No. SES-STA-20160218-00143 ("*180-day STA*") (expires on October 24, 2016).

II. DISCUSSION

A. SPA Terminal Operations

1. The SPA Terminal and the eXConnect System

The SPA terminal is a single-panel variant of the dual-panel PPA terminal and utilizes the same proven antenna and positioning technologies as the PPA. Panasonic has developed the SPA terminal as a lighter, less-costly alternative that can be installed on smaller aircraft and that has performance characteristics equal to or better than the PPA terminal. The SPA terminal has been tested extensively pursuant to experimental authority granted by the Commission.[4]

As set forth in the enclosed application materials, the SPA terminal transmits within the same operational envelope as the PPA terminal and complies with the requirements set forth in Section 25.227 of the Commission's Rules, 47 C.F.R. § 25.227. In particular, the SPA terminal operates in accordance with the coordination agreements of the proposed satellite points of communications, complies with the Commission's two-degree spacing policies, has a pointing accuracy of 0.2º or greater and will automatically cease transmissions if point offset exceeds 0.5º or greater, and otherwise will comply with Panasonic's *ESAA Blanket License*. Thus, grant of this modification application will not increase the potential for interference from the eXConnect System operations in the United States.

Panasonic has fully described the eXConnect System in prior submissions and hereby incorporates by reference the technical showing regarding the control functionality and other

[4] *See*, *e.g.*, Panasonic Avionics Corporation, Experimental Radio Station License, Call Sign WF2XMD, File No. 0184-EX-ML-2013 (2013); *see also* Letter from Carlos Nalda, Counsel to Panasonic Avionics Corporation, to Nnake Nweke, Chief, Experimental Licensing Branch (March 6, 2014).

operational characteristics submitted in connection with prior applications.[5] The attached Technical Appendix, FCC Form 312 and Schedule B contain relevant information relating to the technical parameters, antenna performance information, satellite operator certifications, radiation hazard analysis and general antenna specifications for the SPA terminal.[6] Furthermore, Panasonic certifies that SPA operations will be consistent with the terms, conditions and operational parameters that are currently authorized under Panasonic's *ESAA Blanket License*.

2. Satellite Points of Communication

Panasonic seeks authority for the SPA terminal to communicate with the following satellite points of communication[7] and downlink frequency ranges:[8]

[5] *See*, *e.g.*, Panasonic Avionics Corporation, File No. SES-LIC-20100805-00992 (granted August 31, 2011) (Call Sign E100089) and subsequent amendment and modification applications.

[6] Panasonic notes that because it is relying on satellite operator certifications to demonstrate compatibility with other Ku-band operations, it need not submit the full range of technical data required in the absence of such certifications under Section 25.227 of the Commission's Rules, 47 C.F.R. § 25.227. Nonetheless, Panasonic is submitting substantial technical detail that provides the Commission and interested parties with a comprehensive understanding of the operational characteristics of the SPA terminal.

[7] The Telstar 12V satellite, which is also being added to the *ESAA Blanket License* as an authorized point of communication for the PPA terminal, is among the requested satellite points of communication for the SPA terminal.

[8] The SPA terminal will operate in the uplink direction within the 14.0-14.5 GHz band and consistent with its coordination agreements with co-frequency users, the Commission's Rules and applicable international requirements.

Table 1. Proposed Satellite Points of Communication (SPA)

Satellite	Licensing Admin.[9]	Orbital Location	Downlink Freq. (GHz)	ITU Satellite Network[10]	ITU Region	Service To U.S.[11]
Anik G1	Canada	107.3° W	11.7-12.2	CANSAT-34	2	No
Apstar 6	China	134° E	10.7-12.75	U.S. Market Access	3	No
Apstar 7	China	76.5° E	10.7-12.75	APSTAR-4	1, 3	No
AsiaSat 5	China	100.5° E	11.45-12.2	ASIASAT-EKX	1	No
Eutelsat 10A	France	10° E	11.7-12.2	EUTELSAT 2-10E / EUTELSAT 3-10E	1, 3	No
Eutelsat 70B	France	70.5° E	10.95-11.7 12.5-12.75	EUTELSAT 3-70.5E	1, 3	No
Eutelsat 115WB	Mexico	114.9° W	11.7-12.2	Permitted List	2	Yes
Eutelsat 117WA	Mexico	116.8° W	11.7-12.2	Permitted List	2	Yes

[9] Each licensing administration is a member of the World Trade Organization for services covered under the World Trade Organization Basic Telecommunications Agreement. *See* FCC Form 312 at Item 42; 47 CFR § 25.137(a). To the extent the Commission has not already granted authority to access any of the proposed satellite points of communication, there is a presumption in favor of such access under the Commission's *DISCO II* policies. (*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, *Report and Order*, 12 FCC Rcd 24094, ¶ 25 (1997) (*"DISCO II Order"*).

[10] Panasonic provides the ITU satellite network filing name for each non-U.S. licensed satellite not on the Commission's Permitted Space Station List nor granted U.S. market access.

[11] "Yes" indicates that the relevant satellite will be used for Panasonic's eXConnect System operations in U.S. territory. "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.

Eutelsat 172A	U.S.	172° E	10.95-11.2; 11.45-11.7	U.S.-licensed	2	Yes
IS-14	U.S.	45° W	11.45-11.95	U.S.-licensed	1, 2	No
IS-15	U.S.	85° E	12.25-12.75	U.S.-licensed	3	No
IS-29E	U.S.	50° W	10.95-12.5	U.S.-licensed	1, 2	Yes
JCSAT-5A	Japan	132° E	12.25-12.75	N-STAR-A	1	No
NSS-6	Netherlands	95° E	11.45-12.75; 12.5-12.75	NSS-9	3	No
Superbird C2	Japan	144° E	12.2-12.75	N-SAT2-144E	3	No
Telstar 11N	U.S.	37.5° W	11.45-12.2	U.S.-licensed	1, 2	Yes
Telstar 12V	U.S.	15° W	10.95-12.2	U.S.-licensed	1	No
Telstar 14R	Brazil	63° W	11.7-12.2	Permitted List	2	Yes
Yamal 300K[12]	Netherlands	183° E	10.95-11.7	NSS-19	1, 2	Yes
Yamal 401	Russia	90° E	10.95-11.2; 11.45-12.75	EXPRESS-7C	1, 3	No

All of these proposed satellites are either currently authorized satellite points of communication under the license or, in the case of Telstar 12V, is a U.S.-licensed satellite. Accordingly, the technical and operational parameters of each satellite are well known to the Commission, including each satellite's orbital debris mitigation and end-of-life plans, and no new showing regarding these issues is required. Panasonic more fully describes its proposed

[12] Yamal 300K was recently authorized to support ESAA terminal operations in the U.S. market from its new location at 183° E. *See* File No. SES-MFS-20150609-00349.

ESAA terminal operations with Telstar 12V in Section B, below. In the attached Technical Appendix and Form 312 Schedule B, Panasonic provides information regarding the operational characteristics of the SPA terminal with each satellite identified in Table 1.

Panasonic has confirmed with the operators of each satellite point of communication identified above that they have reviewed the technical characteristics of Panasonic's SPA ESAA terminal operations and such operations are consistent with their coordination agreements and will not result in unacceptable interference to other satellites within +/- 6 degrees of the subject satellite point of communication. Attached hereto are letters confirming that the power levels associated with Panasonic's SPA ESAA terminal operations with each satellite point of communication have been coordinated with operators of adjacent satellites.[13] In addition, when communicating with the above satellite points of communications, Panasonic will operate the SPA terminal consistent with Section 25.227 of the Commission's Rules, 47 C.F.R. § 25.227.

3. SPA Terminal Performance

The SPA terminal fully complies with the provisions of Recommendation ITU-R M.1643, as well as applicable FCC rules and policies governing ESAA operations. The SPA terminal has been tested extensively under experimental Call Sign WF2XMD and the fundamental operational characteristics of the eXConnect System have been approved by the Commission in the prior application proceedings.

Interference will be avoided principally by controlling off-axis EIRP spectral density of emissions along the GSO arc to protect adjacent fixed-satellite service ("FSS") satellites. As noted, Panasonic's serving satellite operators have confirmed that the proposed operations are consistent with the coordinated parameters of their satellites. In addition, the SPA terminal

[13] *See* Technical Appendix, II.

operates in a manner that avoids interference to other co-frequency systems and services, and complies with the coordination agreements Panasonic has entered into with the National Science Foundation to protect radio astronomy operations and with NASA to protect TDRSS operations. The transmission and other principal operational characteristics of the SPA terminal are described more fully in the attached Technical Appendix.

Panasonic's ESAA terminals transmit, including both the PPA and SPA terminals, on individually assigned frequencies and time slots such that, regardless of the number of authorized terminals, only one terminal transmits at a time (*i.e.*, there is no aggregation). Thus, operation of the new SPA terminal will not increase the potential for interference from ESAAs communicating with the eXConnect System.

The attached Technical Appendix provides a detailed description and test data on the operational characteristics of the SPA terminal.

B. Adding Telstar 12V Satellite as a Point of Communication

By this application, Panasonic also seeks to modify its license by adding the Telstar 12V satellite as an authorized point of communication for its SPA and PPA terminals.[14] The technical characteristics of SPA and PPA terminal operations with the Telstar 12V satellite are provided in the associated FCC Form 312 and Schedule B. Panasonic certifies that the remaining information in support of its *ESAA Blanket License*, including the technical information previously submitted for the PPA terminal, has not changed.[15]

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[14] As noted, the Telstar 12V satellite is among the 20 requested satellite points of communications for the SPA terminal. *See* Table 1, *supra*.

[15] Panasonic notes that the PPA terminal satellite arc range in the *ESAA Blanket License* does not accurately reflect the arc range of its authorized points of communication. Panasonic provides the correct satellite arc range in the attached Schedule B.

Panasonic seeks to operate with Telstar 12V (Call Sign S2933), a U.S.-licensed satellite operated by Skynet Satellite Corporation ("Skynet").[16] A summary of ESAA terminal operations with the Telstar 12V satellite have been set forth in Table 1.[17] Although the Telstar 12V satellite is capable of providing service to large areas of Regions 1 and 2, including the United States, Panasonic notes that its seeks to access satellite beams servicing Region 1 only.

Skynet has previously provided the Commission with information regarding the legal and technical qualifications to serve the United States[18] and no new showing on these issues is required to authorize the Panasonic ESAA terminals to communicate with the Telstar 12V satellite. Relevant technical and other required information concerning Panasonic's planned use of the Telstar 12V satellite is contained in the attached FCC Form 312 and Schedule B.

Telesat Canada, a company related to Skynet for Telstar 12V coordination and operation, has reviewed the technical characteristics of Panasonic's ESAA terminal operations and confirmed that such operations are consistent with its coordination agreements and will not result in unacceptable interference to other satellites within +/- 6 degrees of the satellite. Attached hereto is a letter confirming that the power levels associated with Panasonic's ESAA terminal operations with Telstar 12V have been coordinated with operators of adjacent satellites.[19]

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[16] *See* Skynet Satellite Corporation, File No. SAT-LOA-20141010-00107 (Call Sign S2933) (granted Oct. 29, 2015).

[17] This information was also included in the list of proposed authorized satellite points of communication for the SPA terminal. Panasonic ESAA terminals will operate in the uplink direction within the 14.0-14.5 GHz band and consistent with its coordination agreements with co-frequency users, the Commission's rules and applicable international requirements.

[18] *See* Skynet Satellite Corporation, File No. SAT-LOA-20141010-00107 (Call Sign S2933) (granted Oct. 29, 2015).

[19] *See* Technical Appendix, II. & VI.

C. Removal of Outdated License Condition

Panasonic seeks the removal of Condition 90117 of its license, which specifies that if a future NGSO FSS network commences operations, Panasonic will be required to cease operations unless it has successfully coordinated with the NGSO FSS operator or demonstrated that Panasonic's operations will not cause harmful interference to the NGSO FSS network.[20] Panasonic requests this change based on the elevation of ESAA networks to co-primary status in the 14.0-14.5 GHz band after the original adoption of the condition, the absence of specific off-axis EIRP spectral density limits in the subsection of Section 25.227 of the Rules under which Panasonic has obtained ESAA authority, and prior Commission precedent removing a similar condition from an ESAA blanket license under similar circumstances.

Condition 90117, which was included in the July 2013 issuance of the Panasonic license,[21] effectively requires Panasonic to cease operations unless a future NGSO system operator consents to a coordination agreement or Panasonic makes an unspecific showing of non-interference. This requirement reflects the Commission's prior policy that Ku-band aeronautical mobile-satellite service ("AMSS") systems operated on a secondary basis to NGSO FSS in the 14.0-14.5 GHz band. In the 2014 *ESAA Second Report and Order*,[22] however, the Commission elevated ESAA operations to co-primary status with NGSO FSS in the 14.0-14.5

[20] *See* ESAA Blanket License, Special and General Provisions, Condition 90117 ("In the event that a non-geostationary orbit satellite system commences operations in the 14.0-14.5 GHz frequency band, the licensee must cease operations unless such operations have been coordinated with the operator of the NGSO system or licensee has demonstrated that its operations will not cause harmful interference to the NGSO system.").

[21] *See* File No. SES-MFS-20120913-00818 (granted July 24, 2013).

[22] *See* Second Report and Order and Order on Reconsideration, IB Docket No. 12-376, ¶ 9 (rel. April 18, 2014) ("*ESAA Second Report and Order*").

GHz band. Accordingly, it is no longer necessary or appropriate to impose the unduly prescriptive requirements of Condition 90117 with respect to future Ku-band NGSO FSS systems.

Panasonic also notes that because it has consistently applied for Commission authority supported by satellite operator certifications, and more recently specifically sought modification of its license under Section 25.227(a)(2) of the Commission's Rules,[23] the off-axis EIRP spectral density limits for transmissions in directions away from the GSO arc specified in a separate subsection are not directly applicable. Thus, the prescriptive requirements set forth in Condition 90117 lack an applicable, objective technical standard against which they can be measured. Nonetheless, Panasonic (along with its serving satellite operators) would undertake appropriate coordination discussions with future NGSO system operators in accordance with relevant ITU and Commission rules and policies.

Removal of Condition 90117 is also consistent with Commission precedent. Pursuant to a similar request, the Commission removed an identically worded NGSO FSS coordination condition from Gogo LLC's ESAA authorization for many of the same reasons presented here.[24] In addition, other current ESAA authorizations do not include such a condition.[25] In view of the foregoing, Panasonic respectfully requests that the Commission remove Condition 90117 from its license.

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[23] *See, e.g.*, File No. SES-MFS-20150609-00349, Narrative Statement at 10 and FCC §25.227 Compliance Matrix.

[24] *See* Gogo LLC, File No. SES-MFS-20140801-00625 (Call Sign E120106), Narrative at 7 (requesting removal of identically worded but differently number Condition 90078). Subsequent license grant eliminated the condition.

[25] *See*, e.g., Row 44 Inc., File No. SES-MFS-20150424-00270 (Call Sign E080100); Astronics AeroSat Corporation, File No. SES-LIC-20140902-00688 (Call Sign E140087).

III. GRANT OF THE REQUESTED MODIFICATION WILL SERVE THE PUBLIC INTEREST

Grant of the requested modification will serve the public interest by enabling the introduction of the SPA terminal and provide direct benefits to U.S. consumers that will be able to access new in-flight mobile broad applications and will further enhance U.S. leadership in in-flight mobile broadband services. This, in turn, will enhance competition in the mobile broadband market by enabling additional U.S. commercial aircraft equipped with the eXConnect System to better compete with other carriers offering terrestrial-based services and with other airlines offering satellite-based connectivity. Authorizing the new SPA terminal also will facilitate the introduction of this new ESAA terminal for more regularized commercial operations. Because the terminal is lighter-weight and lower-cost, it will strengthen the demand for in-flight connectivity services and will enhance their prospects for long-term success.

In addition, adding the Telstar 12V as an authorized point of communication for the eXConnect System will serve the public interest by extending the coverage and increasing the capacity of Panasonic's global network for U.S. airlines and their passengers. Telstar 12V will provide additional bandwidth for the eXConnect System and ensure that Panasonic has sufficient bandwidth to meet increasing demand and enhance the in-flight user experience within the relevant service area of the satellite.

Finally, removal of Condition 90117 from the ESAA Blanket License is fully consistent with Commission policy and precedent governing ESAA operations. It will also ensure the Panasonic is on a level playing field with other ESAA operators and in the context of coordination with future Ku-band NGSO FSS systems.

IV. CONCLUSION

Based on the foregoing, Panasonic respectfully requests that the Commission modify its *ESAA Blanket License*, Call Sign E100089, by adding the SPA terminal, adding the Telstar 12V satellite as an authorized point of communication and removing Condition 90117 from the license.