

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

In the Matter of

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)	
Application of Panasonic Avionics)	File Nos. SES-LIC-20100805-00992 and
Corporation for Authority to Operate Up to)	SES-AMD-20100914-01163
15 Technically Identical Aeronautical)	
Mobile-Satellite Service (“AMSS”) Aircraft)	Call Sign E100089
Earth Stations (“AESs”) in the 14.0-14.4)	
GHz and 11.7-12.2 GHz Frequency Bands)	

RESPONSE TO PETITION OF ROW 44, INC.

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SUMMARY

Pursuant to Section 25.220 of the Commission's rules, Panasonic Avionics Corporation ("Panasonic") has applied for blanket license authority to operate the eXConnect System, a Ku-band aeronautical mobile-satellite service ("AMSS") network designed to provide broadband connectivity to aircraft in flight. Panasonic's application is focused on the operation of a limited number of MELCO aircraft earth station ("AES") terminals currently installed on Lufthansa commercial aircraft, which were previously authorized to operate in the United States as part of a prior AMSS system. A single petition was filed by an AMSS competitor, Row 44, Inc. ("Row 44"), criticizing certain elements of the application.

As discussed herein, Row 44's criticisms are without merit. Panasonic's application fully satisfies the requirements of Section 25.220, the rule under which AMSS applications are currently considered. Specifically, Panasonic incorporated by reference relevant technical information on the MELCO antenna developed in the prior FCC licensing proceeding, supplemented that information with eXConnect-specific operating characteristics, provided required satellite operator coordination affidavits and requested a waiver of Commission rules to the extent necessary to grant the application. In this submission, Panasonic definitively addresses the only technical deficiency claimed by Row 44 with respect to Section 25.220 compliance – failure to submit antenna patterns specified in Section 25.132(b) of the rules – by submitting the full range of antenna patterns herewith.

Although Panasonic need not respond to Row 44's other arguments, it is compelled do so to ensure the record of this proceeding reflects an appropriate understanding of the rules and policies governing AMSS licensing, and the information set forth in Panasonic's AMSS application. Row 44 attempts to magnify minor uncertainties in the application materials (all of which can be clarified by reference to the record) into reasons for dismissal or denial. In

addition, Row 44 inexplicably ignores its own AMSS licensing precedent, fundamentally misreads the Commission's rules and policies, and mischaracterizes Panasonic's application to suggest that eXConnect operations should not be authorized. Although none of the purported deficiencies alleged by Row 44 constitutes a basis to delay or deny grant of the instant application, Panasonic is providing supplemental information that resolves any questions with its AMSS application.

In this connection and out of an abundance of caution, Panasonic is filing a minor amendment to its AMSS application to formally incorporate the additional information provided in this submission. Panasonic is also reducing the proposed maximum EIRP per carrier of the MELCO antenna (thus decreasing its potential for interference) from 42.1 dBW to 41.3 dBW, which correctly reflects the fact that the transmit power is not uniform across the emissions designator bandwidth but rolls off at the edges. Finally, Panasonic herein acknowledges and accepts the additional conditions imposed on U.S. AMSS operations adopted in prior Commission licensing orders.

In sum, the Panasonic AMSS application fully satisfies the requirements of Section 25.220 of the rules. Panasonic also has established that the eXConnect System can operate in compliance with the Commission's AMSS licensing policies and precedent, and that Panasonic will comply with the additional conditions previously imposed on U.S. AMSS licensees. Accordingly, the Commission should grant the Panasonic AMSS application at the earliest practicable time.

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**Before the
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In the Matter of

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Application of Panasonic Avionics Corporation for Authority to Operate Up to 15 Technically Identical Aeronautical Mobile-Satellite Service (“AMSS”) Aircraft Earth Stations (“AESs”) in the 14.0-14.4 GHz and 11.7-12.2 GHz Frequency Bands)	File Nos. SES-LIC-20100805-00992 and SES-AMD-20100914-01163
)	
)	Call Sign E100089
)	

RESPONSE TO PETITION OF ROW 44, INC.

Panasonic Avionics Corporation (“Panasonic”), by its attorneys and in accordance with Section 25.154(e) of the Commission’s rules, 47 C.F.R. §25.154(e), hereby submits its response to the Petition filed by Row 44, Inc. (“Row 44”) in the above-captioned proceeding.¹ Panasonic is the applicant for blanket license authority to operate a limited number of aircraft earth stations (“AESs”) in the Ku-band aeronautical mobile-satellite service (“AMSS”) under Section 25.220 of the Commission’s rules, 47 C.F.R. §25.220.²

As discussed herein, the criticisms set forth in the Petition filed by Row 44 are baseless. The Petition attempts to magnify minor uncertainties in the application materials, all of which

¹ See Petition of Row 44, Inc., File Nos. SES-LIC-201000805-00992 and SES-AMD-20100914-01163 (Call Sign E100089) (dated Oct. 15, 2010) (“Petition”).

² See Application of Panasonic Avionics Corporation for Authority to Operate Up to 15 Technically Identical Aeronautical Mobile-Satellite Service (“AMSS”) Aircraft Earth Stations (“AESs”) in the 14.0-14.4 GHz and 11.7-12.2 GHz Frequency Bands, File Nos. SES-LIC-201000805-00992 and SES-AMD-20100914-01163 (Call Sign E100089) (collectively, the “Panasonic AMSS Application”); see also Panasonic Avionics Corporation, Notice and Clarification, File Nos. SES-LIC-201000805-00992 and SES-AMD-20100914-01163 (Call Sign E100089) dated Oct. 18, 2010 (“Panasonic Notice and Clarification”).

can be clarified by reference to the record of this proceeding, into reasons for dismissal or denial. Row 44 also inexplicably ignores its own AMSS licensing precedent, fundamentally misreads the Commission's rules and policies, and mischaracterizes Panasonic's AMSS application to suggest that Panasonic has failed to satisfy so-called "requirements" that have no foundation in applicable rules. Because Panasonic's AMSS application fully satisfies the Commission's rules and policies, it should be granted at the earliest practicable time.

I. BACKGROUND

Panasonic, the world's leading manufacturer of advanced in-flight entertainment ("IFE") and communication systems for commercial airlines, has developed the eXConnect Ku-band AMSS system to provide satellite-based, broadband connectivity to aircraft in flight. On August 5, 2010, Panasonic filed an application for authority to operate up to 15 MELCO AESs installed on Lufthansa aircraft while such aircraft are located in the United States. These AES antennas were previously authorized to operate in the United States as part of the Connexion by Boeing system.³ Panasonic subsequently filed a minor amendment to its application on September 14, 2010, to provide additional information relating to MELCO AES operations.

In its application, as amended, Panasonic provided technical and coordination information required by Section 25.220 of the Commission's rules, included supplemental technical data demonstrating compliance with two-degree spacing requirements and analogous rules governing Ku-band mobile VSATs (i.e., earth stations onboard vessels ("ESVs") and vehicle-mounted earth stations ("VMESs")), and incorporated by reference extensive technical

³ See Panasonic AMSS Application at 3 (citing *The Boeing Company Application for Blanket Authority To Operate up to Eight Hundred Technically Identical Receive-Only Mobile Earth Stations Aboard Aircraft in the 11.7-12.2 GHz Frequency Band*, Order and Authorization, DA 01-658 (2001) (Call Sign E000723) (File No. SES-LIC-20001204-02300).

information on MELCO antenna performance set forth in the original Boeing application proceeding. Panasonic also requested waiver of the Commission's rules to the extent necessary to grant Panasonic's AMSS application.

A single petition questioning certain elements of the Panasonic AMSS application was filed by Row 44, a U.S. AMSS licensee and competitor to Panasonic. Despite having recently received a Ku-band AMSS license from the Commission, the Row 44 Petition reveals fundamental misunderstandings of the Commission's rules and policies governing Ku-band AMSS licensing, as well as the information set forth in Panasonic's AMSS application. Although Row 44's confusion may be partially attributed to the lack of U.S. Ku-band AMSS licensing and service rules, it inexplicably ignores the most relevant Commission precedent—Row 44's own AMSS licensing order.⁴ Given these errors and omissions, the Row 44 Petition appears designed more to distract and confuse than substantively critique Panasonic's application.

Because Panasonic's AMSS application is considered under Section 25.220 of the Commission's rules, 47 C.F.R. §25.220,⁵ the vast majority of Row 44's criticisms – which are focused on inapplicable rule provisions – can be dismissed as moot. However, because many of Row 44's irrelevant criticisms mischaracterize applicable FCC rules and policies or the information set forth in Panasonic's AMSS application, Panasonic takes this opportunity to respond to Row 44's principal arguments and further supplement the record so that the

⁴ See *Row 44, Inc. Application for Authority to Operate Up to 1,000 Technically Identical Aeronautical Mobile Satellite Service Transmit/Receive Earth Stations Aboard Commercial and Private Aircraft*, Order and Authorization, DA 09-1752 (Int'l Bur. and OET, 2009) (“*Row 44 Order*”).

⁵ See Panasonic Notice and Clarification; see also *Row 44 Order* at ¶ 23 (“Even if ...Section 25.220 does not apply to Row 44's application, we consider it appropriate, as a matter of policy, to use an approach analogous to the one in Section 25.220....”). Not surprisingly, Row 44 did not object to processing the Panasonic AMSS Application under Section 25.220.

Commission can be assured, as established in Panasonic's original application materials, that commercial operation of the eXConnect system will be fully consistent with its Ku-band AMSS licensing precedent.

II. PANASONIC'S AMSS APPLICATION SATISFIES THE REQUIREMENTS FOR GRANT UNDER SECTION 25.220 OF THE RULES

The Commission has made clear that it is appropriate to consider Ku-band AMSS applications under Section 25.220 of the rules.⁶ That provision sets forth straightforward technical and operational information to be submitted with the application, including (i) a detailed description of the services to be provided, such as the frequency bands and satellites to be used; (ii) certifications from serving satellite operators; (iii) antenna gain patterns and proposed power and power density levels; and (iv) identification of any rules for which a waiver is sought.⁷ Panasonic provided this information – and substantially more technical data regarding MELCO antenna operations – in its AMSS application.

Row 44 claims that Panasonic's technical demonstration under Section 25.220 is defective because it fails to include the full range of antenna gain patterns specified in Section 25.132(b) of the rules.⁸ This is the only technical deficiency Row 44 claims with respect to Panasonic's showing under Section 25.220.⁹ However, Row 44 fails to acknowledge the full

⁶ See *Row 44 Order* at ¶ 23.

⁷ See generally 47 C.F.R. § 25.220.

⁸ See *Petition* at 8-9 (*citing* Section B of the Technical Appendix of the Panasonic AMSS Application”).

⁹ Row 44 suggests without citation that the Telesat coordination affidavit should be countersigned as is customary, but there is no such requirement in the Commission's rules because such a requirement was expressly rejected when the Commission adopted Section 25.220. See *infra* Section III.C.3. Row 44 also erroneously cites Recommendation ITU-R

breadth of the antenna gain and other technical data associated with the Panasonic application, as well as the specific request for waiver made by Panasonic with respect to its technical demonstration.

In its application, Panasonic provided summary transmit and receive antenna gain plots (+/- 10° and +/- 90° versions) for azimuth and elevation at 14.2 GHz for the vertical polarization.¹⁰ In addition, rather than resubmitting the extensive technical information regarding the MELCO antenna (e.g., antenna gain plots, all of which were also at 14.2 GHz), Panasonic incorporated by reference the MELCO antenna data included in the prior application proceeding for this terminal.¹¹ Thus, all of the MELCO technical information that the Commission deemed to be sufficient to support grant of prior authority to operate (including antenna gain data) is associated with Panasonic's application.

Panasonic recognized that the MELCO antenna data on file with the Commission may not account for subsequently adopted rules and that there is a limited need to independently develop additional technical information for an AES antenna that has been installed on dozens of aircraft and previously operated in the United States pursuant to prior Commission authority. Panasonic therefore requested a waiver of the Commission's rules – *including, specifically,*

M.1643 and pointing accuracy values, even though they are unrelated to submission of antenna gain patterns. Panasonic addresses these and other “red herrings” herein.

¹⁰ See Panasonic AMSS Application, Technical Appendix, Section B at 16-19. The antenna gain patterns inadvertently excluded frequency and polarization labels.

¹¹ See Panasonic AMSS Application at 7 (*citing* File No. SES-MOD-20030512-00639, Call Sign E000723).

Section 25.132 – with respect to the technical information submitted with its application.¹² As discussed therein, there is ample basis to grant such a waiver.¹³

To definitively respond to this issue, however, Panasonic is submitting complete antenna gain data for the MELCO antenna required under *Section 25.132(b)*.¹⁴ Panasonic is also providing further affidavits from serving and potentially affected satellite operators that they have reviewed Panasonic’s technical data and do not object to grant of the Panasonic AMSS application.¹⁵ With the submission of this information, Panasonic has fully resolved the substantive issues raised by Row 44 regarding compliance with *Section 25.220* and the Commission should grant the Panasonic AMSS application forthwith.¹⁶

III. ROW 44’S OTHER LEGAL AND TECHNICAL CRITICISMS ARE GENERALLY ERRONEOUS AND WITHOUT FOUNDATION

Although Panasonic need not respond Row 44’s other arguments, it is compelled do so to ensure the record of this proceeding reflects an appropriate understanding of the rules and policies governing AMSS licensing, and the information set forth in Panasonic’s AMSS application. Panasonic’s response to these issues is limited to correcting the erroneous legal and technical assertions contained in the Row 44 Petition, and does not seek to fully unwind the confusing cross-citations to FCC rule provisions that are irrelevant to applications considered under *Section 25.220*.

¹² *See* Panasonic AMSS Application at 10.

¹³ *See id.* at 10 -11.

¹⁴ *See* Attachment A.

¹⁵ *See* Attachment B; *see also* Row 44 Order at ¶¶ 21, 23.

¹⁶ Panasonic acknowledges that the Regulatory Compliance Index submitted with its application inadvertently referenced *Sections 25.220 (c) and (e)* rather than *25.220(d)*, but this does not affect the substance of Panasonic’s application or the completeness of this response.

A. Reliance on Prior Commission Authorization of MELCO AES Operations Is Warranted, if not Essential, in the Circumstances of this Proceeding

Although Row 44 emphasizes that “the only common element between the Panasonic Avionics proposal and Boeing’s 2003 system is the MELCO Antenna hardware itself,”¹⁷ it strangely suggests that Panasonic’s reliance on antenna information provided in the prior licensing proceeding is “misplaced.”¹⁸ Row 44 then goes on to contrast the Panasonic application, albeit erroneously, with elements of the prior MELCO application proceeding which it claims to be irrelevant. In fact, reliance on technical information regarding the MELCO antenna provided in the Commission’s prior licensing proceeding is entirely appropriate.

1. Reference to the Prior MELCO Application Proceeding Is Necessary and Appropriate

The Commission previously examined the technical and operating characteristics of the MELCO antenna and Panasonic seeks to operate the very same antenna with the eXConnect System. It would be a tremendous waste of the Commission’s scarce administrative resources to ignore the record – and conclusions – of the prior MELCO licensing proceeding.

Panasonic is taking installed and previously authorized AES terminals, replacing their modems and then returning them to service. All of the relevant hardware, including the antenna, radome, power amplifiers, up-converters, power supplies and antenna controller – everything except the iDirect modem (“broadband controller”) – are the same equipment previously licensed by the Commission to operate in the United States. Panasonic would be remiss if it *failed* to place the extensive regulatory, technical and operational history of the MELCO terminals into the record of its AMSS application.

¹⁷ Petition at 3.

¹⁸ *Id.* at 12-13.

Panasonic incorporated by reference detailed antenna characteristics and pointing accuracy data submitted during the prior MELCO licensing process – data that the FCC has already reviewed and found sufficient to support grant – and provided supplementary data addressing the differences associated with the new modem and transmission scheme. Thus, Panasonic’s application contains at least the same level of antenna performance information as the prior successful AMSS application.¹⁹

2. The Previously Authorized AMSS System Had a Greater Interference Potential Than Does the Panasonic eXConnect System

Although Row 44 suggests that reliance on the prior MELCO licensing proceeding is misplaced, it nonetheless raises the difference between the TDMA operation of the eXConnect System and the CDMA operation of the Boeing AMSS system to challenge Panasonic’s application.²⁰ This fundamental difference, however, actually simplifies the operating situation considerably. Boeing’s CDMA system had many aircraft transmitting simultaneously in the same bandwidth so the interference potential of the system was a function of the aggregate emissions of many terminals. Controlling aggregate emissions, particularly in the context of variable uplink power based on individual aircraft capacity demand, was quite complex. With Panasonic’s TDMA system, no aggregation occurs – only one terminal will be transmitting in a given bandwidth at a given time so the interference properties of the system are reduced to the antenna pattern of the terminal and the operating EIRP spectral density. This is easily managed by the eXConnect System’s network control functionality described in Panasonic’s application.²¹

¹⁹ Panasonic is adding the iDirect modem to the MELCO terminal. The iDirect waveform, access protocol and control mechanisms are well-understood and proven in the real world. iDirect is used by thousands of satellite terminals in the United States, including mobile VSATs.

²⁰ See Petition at 12.

²¹ See Panasonic AMSS Application at 8-9.

Row 44 continues by speciously calculating Boeing's EIRP spectral density as 5.6 dBW/4 kHz and comparing it to the 8.6 dBW/4kHz value in Panasonic's AMSS application. Row 44's calculation is misleading because it only considers the widest emissions designator of several in Boeing's authorization and ignores the highest power levels in the authorization. In actuality, Boeing was authorized to operate at *higher* power densities than Panasonic requests in its application. In Boeing's authorization to operate the MELCO antenna²² cited by Row 44, the maximum EIRP spectral density authorized is 8.9 dBW/4kHz for the 24M3G7D emissions designator. That value is higher than the 8.6 dBW/4kHz for which Panasonic has applied. Panasonic is using the same antenna with a lower power spectral density and therefore will have a lower interference potential. The rest of Row 44's argument, which hangs on its erroneous EIRP spectral density calculation, is moot and should be ignored.

In sum, the antenna pattern and pointing characteristics of the MELCO antenna have not changed and the maximum EIRP spectral power density for which Panasonic requests authority is lower than the level previously authorized for the antenna.²³ Therefore, the interference characteristics of the Panasonic eXConnect system will be equal to or better than the previously authorized Connexion by Boeing system.

B. Row 44's Technical Challenges Are Generally Erroneous

Row 44 broadly suggests that the technical data included with Panasonic's AMSS application is internally inconsistent and incomplete. Although Panasonic acknowledges an uncertainty with respect to the maximum input power level of the MELCO antenna and is

²² File No. SES-MOD-20030512-00639.

²³ From an interference standpoint, the import link is the maximum input power density from the modem (which has been reduced) into the antenna (which hasn't changed), resulting in a lower maximum EIRP spectral density.

therefore reducing the value included in its original application, it would otherwise note that Row 44's additional technical arguments are based on a fundamental misreading of the Panasonic application materials and the Commission's rules.

1. Maximum EIRP Per Carrier of the MELCO Antenna

In its application, Panasonic requested authority to operate the MELCO antenna at a maximum EIRP per carrier of 42.1 dBW EIRP.²⁴ As discussed below, Panasonic is reducing this value to 41.3 dBW to reflect the fact that the transmit power is not uniform across the emissions designator bandwidth but rolls off at the edges of the bandwidth. Row 44's other criticisms of the MELCO antenna power level information are misguided.

a. Panasonic Is Reducing the Maximum EIRP Per Carrier of the MELCO Antenna

Row 44 notes that there is a difference between the maximum EIRP included in Form 312 (42.1 dBW) and that listed in Appendix D (41.3 dBW) of Panasonic's application. The difference is due to the terms of the maximum power density and the emissions designator bandwidth. Both cases are for the EIRP spectral density – the critical parameter for interference – of 8.6 dBW/4 kHz. The 42.1 dBW from Form 312 is consistent with the necessary bandwidth for the maximum bandwidth emissions of 9 MHz. The 41.3 dBW value, however, correctly reflects the fact that the transmit power is not uniform across the emissions designator bandwidth but rolls off at the edges of the bandwidth. To eliminate the uncertainty associated with these values, Panasonic is *reducing* the maximum EIRP per carrier power listed in Form 312 to 41.3 dBW, thereby reducing the potential for interference of the eXConnect system, and is making corresponding changes in power for the other emissions designators.

²⁴ See IBFS File No. SES-LIC-20100805-00992, FCC Form 312, Schedule B.

b. Panasonic Is Providing an Updated Link Budget

Row 44 asserts incorrectly that there is a major discrepancy between the maximum power level of 47.2 dBW EIRP listed in the link budget and the 42.1 dBW EIRP originally listed in Panasonic's license application.²⁵ This erroneous contention appears to stem from a misreading of the Panasonic link budget that confuses the maximum EIRP capability of the hardware with the operating EIRP of the terminal.

The MELCO antenna is capable of a maximum EIRP of 47.2 dBW as clearly identified in Table 1, Technical Appendix, Section 2.2.2. This is a transmit hardware limitation. In practice, transmitters are rarely operated at their maximum power and Panasonic has not requested authority to operate at this level. The difference between the maximum power of a transmitter and the operating power is called the back-off. The back-off for the link budget in question is clearly listed on the second line in the uplink section as 12.4 dB. This means that the transmit EIRP in the link budget is $47.2 \text{ dBW} - 12.4 \text{ dB} = 34.8 \text{ dBW}$, which is well below the 42.1 dBW value originally listed and the 41.3 dBW value now included in the application (i.e., the link can be closed at this lower transmit power).

Other comments predicated on this fundamental misreading of the link budget are irrelevant and can be ignored. Row 44 also erroneously suggests, without foundation, that Panasonic must submit coverage maps with its link budget. Curiously, however, Row 44 seems to have overlooked that the final end-to-end section of the link budget was inadvertently omitted due to a reproduction error. Panasonic has attached another version of the link budget with the final section restored but otherwise unmodified.²⁶

²⁵ See Petition at 10.

²⁶ See Attachment C.

c. Panasonic Is Providing an Updated Radiation Hazard Analysis

Row 44 also suggests an alleged discrepancy between the 47.2 dBW maximum power of the MELCO antenna and the 46.7 dBW maximum power listed in the radiation hazard analysis.²⁷ The 46.7 dBW value was included in the original Boeing application but was a design value rather than performance value. The production MELCO antenna proved capable of operating at 47.2 dBW, but Panasonic will not operate the antenna in the United States above 41.3 dBW EIRP. Panasonic has submitted a revised radiation hazard analysis based on this higher value.²⁸ The fact that the operating power is restricted to 41.3 dBW provides an additional 5.9 dB of margin in the analysis, which makes the radiation hazard study very conservative (*i.e.*, results in larger protection zones).

2. Panasonic Provided Worst-Case Off-Axis EIRP Data

Row 44 asserts that the off-axis EIRP spectral density information submitted by Panasonic is “limited and ambiguous” and “not sufficient to comply with the detailed requirements of the Rules.”²⁹ Specifically, Row 44 states that Panasonic did not explain the full range of variables that were used to generate the maximum off-axis EIRP spectral density plot and tables.³⁰ This contention is simply incorrect.

Panasonic’s off-axis EIRP spectral density plot was explicitly performed with a skew angle threshold of 34° and the link parameters included in the example link budget, which

²⁷ See Petition at n. 13.

²⁸ See Attachment D.

²⁹ Petition at 6.

³⁰ *Id.*

included the maximum EIRP spectral density of 8.6 dBW/4kHz.³¹ Off-set patterns shown with a 0.25 deg pointing error demonstrate that even with this pointing error and edge of coverage conditions, the antenna transmissions remain below the permissible off-axis EIRP spectral density limits along the GSO arc.³²

3. The MELCO Antenna Has Essentially Equivalent Performance in Both Polarizations

In criticizing Panasonic's antenna gain information (a criticism fully addressed by submission of complete antenna gain data with this reply), Row 44 asserts that the MELCO antenna may have significantly worse performance in the horizontal polarization given a 1 dB difference in antenna gain plots in the prior Boeing proceeding.³³ This overstates the difference in the two polarizations by failing to note that the side lobes occur at slightly different off-axis angles between polarizations and that the limiting points relative to the off-axis mask are not at the peak of the side lobe. For example, the peak of the horizontal side lobe is at approximately 3.0° off-axis in the azimuth plane while the peak of the vertical sidelobe is at approximately 3.2° off-axis. While there may be an approximately 1 dB difference in the side lobe peaks at these points, the off-axis mask at these points also differs by 0.7 dB so, relative to the mask, the net difference at the sidelobe peaks is only a few tenths of a dB.

³¹ See Panasonic AMSS Application at 16 and Technical Appendix at 12 and Appendix A.

³² *Id.* Row 44 further notes that Panasonic did not provide off-axis EIRP spectral density information between 90° and 180°. See Petition at 6. This information is not required by Section 25.220. Panasonic addressed this issue in its waiver request and prior authority to operate the MELCO antenna was granted on the basis of data similar to that submitted by Panasonic. Of course, this issue is somewhat academic since the AES antennas are mounted on the top of the fuselage on wide body jetliners, which provide significant attenuation between 90°- 180°.

³³ Petition at 8-9.

Row 44 specifically referenced a set of azimuth plane gain plots for 14.2 GHz from the Boeing application when citing the difference in the horizontal and vertical gain patterns.³⁴ Figure 1 shows an example off-axis EIRP spectral density for both polarizations in the azimuth plane based on the azimuth plots referenced by Row 44. The vertical polarization maximum EIRP spectral density is set at 8.6 dBW/4 kHz and the maximum EIRP spectral density for the horizontal polarization has been set so as to produce no more off-axis EIRP relative to the mask than for the vertical polarization case. The difference in maximum EIRP spectral density is only 0.5 dB, which is nearly inconsequential – particularly when, as shown in Figure 1, the levels in both polarizations remain below the mask. This remains essentially constant over the operating skew angles. When operating in horizontal polarization, Panasonic will reduce its maximum EIRP spectral density when necessary to remain compliant with the mask.

³⁴ See Petition at 8-9.

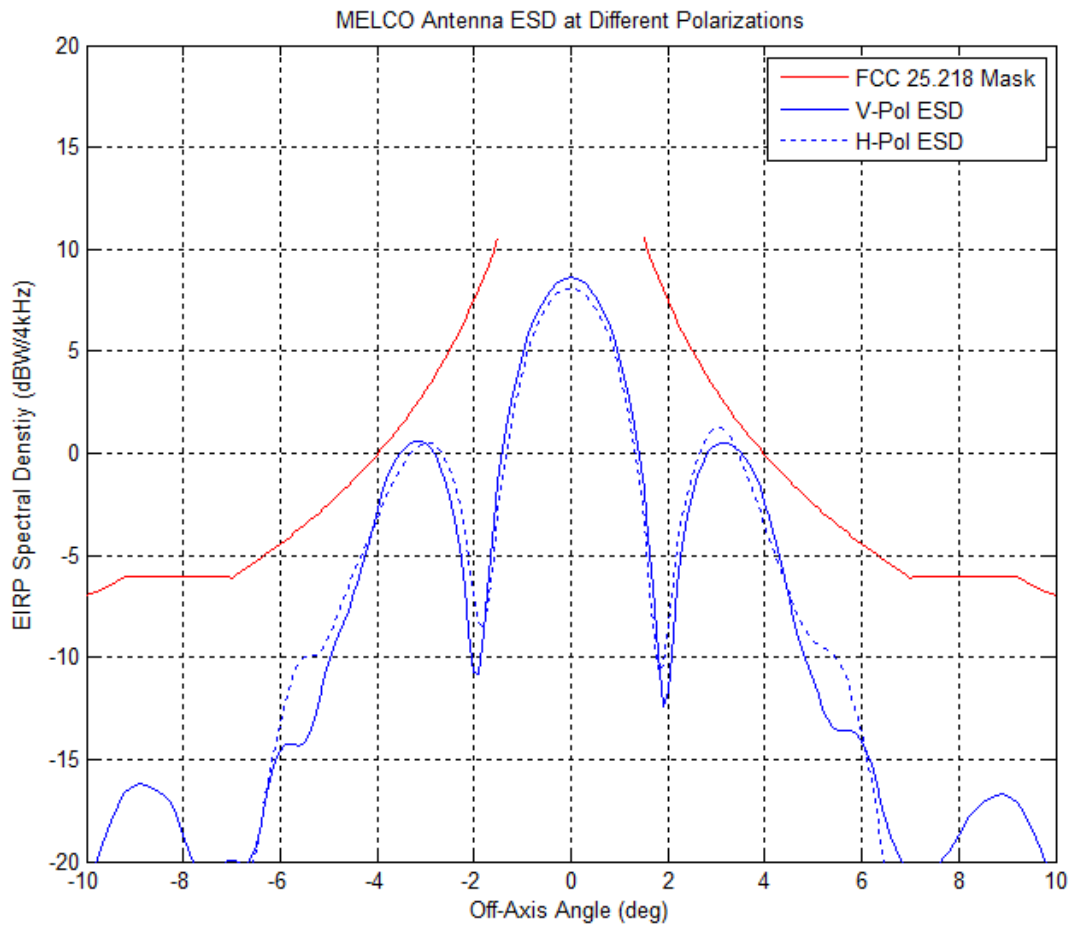


Figure 1. Off-axis EIRP Spectral Density for the MELCO Antenna (Horizontal-Polarization and Vertical-Polarization)

4. The MELCO Antenna Has Essentially Equivalent Performance Across Frequency Bands

Row 44 also asserts that there will be significant variation in the MELCO antenna pattern with frequency.³⁵ This also is a gross overstatement. Figure 2 extends the example in Figure 1 across the transmit band by plotting the off-axis EIRP of the system for the top, middle and bottom of the transmit band for the vertical polarization. The middle-band maximum EIRP spectral density is set at 8.6 dBW/4 kHz and the maximum EIRP spectral density for the top and

³⁵ See Petition at 9.

bottom bands have been set so as to produce no more off-axis EIRP spectral density relative to the mask than the middle-band case. The difference for the bottom-band case is 0 dB – it actually produces a lower off-axis EIRP spectral density relative to the mask than the middle-band case for the same maximum EIRP spectral density. The difference for the top-band case is only 0.6 dB, which, like the polarization case, is also minor. Panasonic will reduce its peak EIRP spectral density accordingly to remain compliant when necessary.

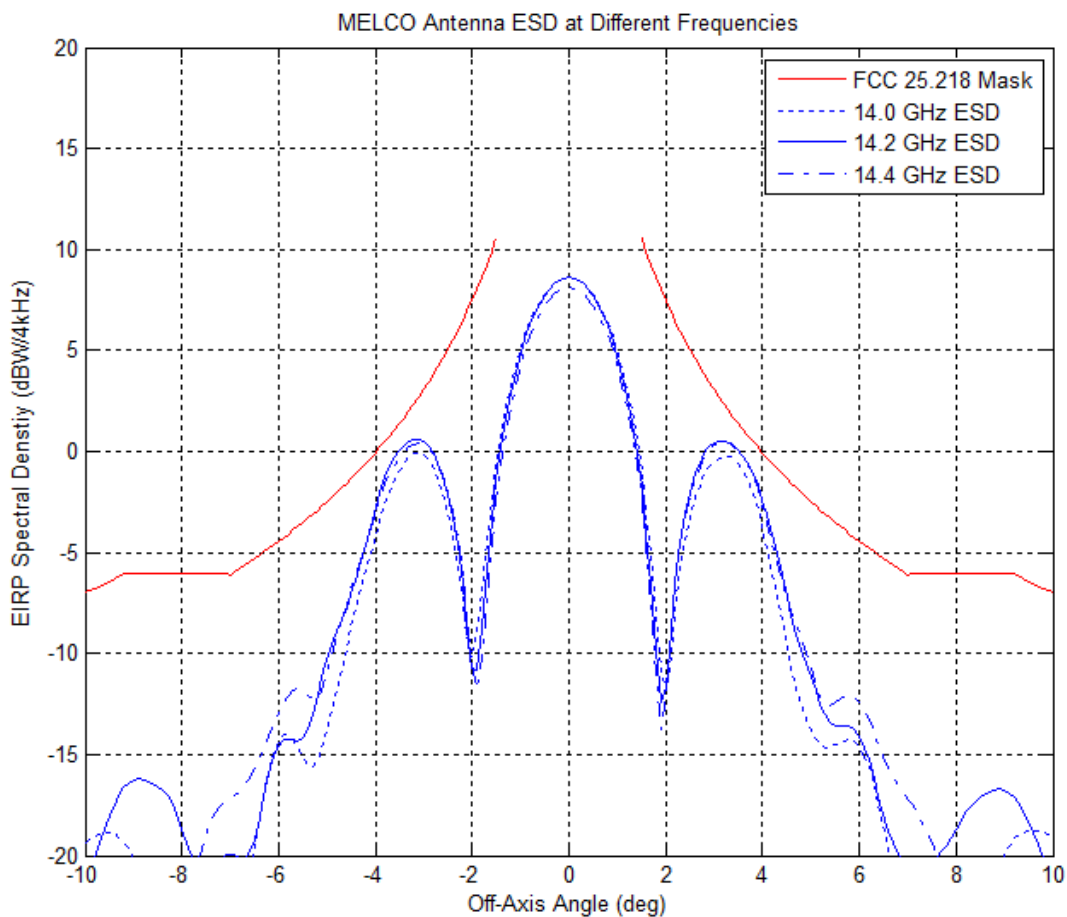


Figure 2. Off-axis EIRP Spectral Density for MELCO Antenna (Top, Mid, and Bottom of Band)

Along with these erroneous technical assertions, Row 44’s petition suggests that Panasonic cannot have sufficient knowledge of the operating characteristics of the MELCO

antenna to maintain compliance with the FCC mask or to avoid interference.³⁶ However, Panasonic has access to all of the technical information associated with the MELCO antenna from the prior licensing proceeding (deemed sufficient to grant Boeing full commercial authority to operate the MELCO antenna) and detailed technical data on Panasonic's own system components. Panasonic has also operated the MELCO antenna on a trial basis for nearly a year without a single interference incident. This is more than enough information to operate the eXConnect system in accordance with the Commission's rules and policies on a long-term commercial basis.

C. Row 44's Legal Arguments Are Equally Baseless

Row 44 also suggests that Panasonic's AMSS application is legally insufficient for various reasons. However, each and every one of Row 44's legal arguments are unsubstantiated and have no basis in the Commission's rules. Row 44 seeks to impose requirements of its own invention on an impending AMSS competitor in an apparent effort to delay license grant and elicit competitively sensitive information. As Row 44 is well aware, such efforts have no place in FCC licensing proceedings.

1. There is No Requirement for Panasonic To Provide Tracking and Pointing Performance Flight Test Data

Row 44 expressly acknowledges that "the FCC's Rules nowhere require flight testing prior either to the filing of an FCC Earth Station application or to FCC action on such an application."³⁷ Paradoxically, Row 44 goes on to argue that "where an applicant has placed significant reliance on claims of *successful non-interference operation* during flight testing, it is appropriate for it to submit *such data as it may have derived from such testing* to demonstrate the

³⁶ *See id.*

³⁷ Petition at 13.

accuracy of these claims.”³⁸ Row 44’s contention is a patent non sequitur. A reliance on verifiable non-interference operations supported by satellite operator affidavits does not entitle Row 44 to all data derived by Panasonic during such trials.

Row 44 compounds this error by arguing that Panasonic “should submit for the record the data on tracking and pointing performance that it has derived from this testing.”³⁹ Since Row 44 recognizes that the MELCO AES is the “common element” between the eXConnect System and Boeing’s previously authorized system,⁴⁰ it should also recognize (and review at its leisure) the extensive data on antenna tracking performance and pointing control included in the prior licensing proceeding, which was incorporated by reference in Panasonic’s application.⁴¹

Panasonic’s flight trials were not designed to test MELCO antenna pointing control and tracking performance (which are well-documented) but rather to test link performance in various flight conditions. Although Row 44 may be interested in such information from a competitive standpoint, there is no basis to require the submission of such information for the Commission to grant the Panasonic application.

Finally, Row 44 seeks to inappropriately bootstrap Panasonic’s citation of the *Row 44 Order* as relevant AMSS licensing precedent into a requirement to file flight test data because “Row 44 provided such data in connection with its own AMSS license application...”⁴² Actual review of the *Row 44 Order* reveals that the submission of flight test data was not of decisional

³⁸ *Id.* (emphasis added).

³⁹ *Id.*

⁴⁰ Petition at 3.

⁴¹ See Panasonic AMSS Application at 7.

⁴² Petition at 13.

significance because, like the instant AMSS application, Row 44's AMSS application was evaluated under Section 25.220, and like here, the proposed operations were fully coordinated among potentially affected satellite operators.⁴³

2. Row 44 Mischaracterizes AMSS Pointing Accuracy Provisions

In its Petition, Row 44: (i) quibbles about whether MELCO antenna pointing accuracy “is less than 0.25° ...[or] maintained to 0.25° 1-sigma;”⁴⁴ (ii) suggests that “insufficient antenna pattern data has been provided to ensure that the MELCO Antenna will be able to comply with the antenna pointing requirements of ITU-R Rec. M.1643” (another non sequitur);⁴⁵ and (iii) claims there is a “general FCC requirement to maintain pointing accuracy to within 0.2 degrees.”⁴⁶ Each of these assertions is legally unsupportable.

The antenna pointing section of the Technical Appendix clearly identifies the pointing accuracy of the MELCO antenna as 0.25° 1-sigma,⁴⁷ the same pointing accuracy that the MELCO antenna had when previously authorized to operate by the Commission. In addition, Panasonic accounts for pointing error in its off-axis EIRP calculations such that even if the MELCO antenna is mispointing at 0.25° for 100% of the time, the antenna would still comply with the permissible off-axis EIRP spectral density mask. Pointing error exceeds 0.25° for a small percentage of the time based on statistical characterization of the error, but the 0.25° 1-sigma pointing error (as thoroughly tested by Boeing) only applies to periods of very high-rate

⁴³ See *Row 44 Order* at ¶ 22-25.

⁴⁴ Petition at 9.

⁴⁵ *Id.*

⁴⁶ Petition at 6.

⁴⁷ See *Panasonic AMSS Application*, Technical Appendix at 4.

maneuvers, which occurs rarely in the flight profile of a wide body aircraft. Under most circumstances the pointing error will be considerably less than the specified pointing accuracy value.

Although not related to antenna gain as suggested by Row 44, Panasonic's approach to pointing accuracy is entirely consistent with the Commission's pointing accuracy requirement and ITU-R Recommendation M.1643, Part A, which provides that design, coordination and operation of an AES should account for factors including mispointing, which could vary the aggregate off-axis EIRP levels generated by the AES. Likewise, the MELCO AES transmissions are consistent with the Commission's Ku-band off-axis EIRP mask, notwithstanding the fact that the Panasonic AMSS application is not being considered under the Ku-band FSS, ESV or VMES rules.

Row 44's suggestion that there is a "general FCC requirement to maintain pointing accuracy to within 0.2 degrees"⁴⁸ also fundamentally misstates the actual pointing accuracy provisions adopted in the Commission's analogous ESV and VMES rules. Specifically, the Commission has *expressly rejected* a requirement that mobile VSAT licensees maintain a pointing accuracy of 0.2° in favor of allowing applicants to declare a pointing accuracy in excess of that value so long as compliance with permissible off-axis EIRP spectral density levels is maintained.⁴⁹ That is what Panasonic has done in its AMSS application by taking pointing accuracy into account when calculating maximum off-axis EIRP spectral density levels.

⁴⁸ Petition at 6.

⁴⁹ See 47 C.F.R. §§ 25.222(a)(1)(ii)(B) and 25.226(a)(1)(ii)(B).

For the foregoing reasons, and because the Commission previously authorized the MELCO antenna to operate (and it did so for years without interference with a pointing accuracy value of 0.25° 1-sigma), Row 44's pointing accuracy claims must be rejected in their entirety.

3. Row 44 Misstates the Commission's Coordination Requirements Under Section 25.220

Row 44 suggests that the coordination information provided under Section 25.220 is deficient for several reasons, all of which fail to survive scrutiny. First, Row 44 notes that the Telesat coordination affidavit included with the application is not countersigned as is "customary."⁵⁰ However, the Commission not once but twice explicitly rejected a proposal to require countersignatures in the context of Section 25.220 coordination affidavits.⁵¹ The second time was on reconsideration during the pendency of Row 44's own AMSS application, when the Commission determined:

...in the Order above, the Commission considered and declined another SIA proposal to require signatures from both the target satellite operator and adjacent satellite operators on certifications, because it was unnecessary in light of the Commission's historical reliance on satellite operators to work together cooperatively to reach coordination agreements. Moreover, even if a target satellite operator neglected to coordinate with an affected adjacent satellite operator, the Commission's procedure includes an additional opportunity for those satellite operators to comment. There is nothing in the record to justify a different result here.⁵²

⁵⁰ Petition at 7, n. 9.

⁵¹ See 2000 Biennial Regulatory Review – Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, IB Docket No. 00-248, Fifth Report and Order, FCC 05-63, ¶¶ 21, 52 (2005); Eighth Report and Order, FCC 08-246, ¶¶ 47, 50, 100-101 (2008) ("Part 25 Eighth R&O").

⁵² Part 25 Eighth R&O at ¶ 101 (citations omitted).

Countersignatures thus are plainly not required, particularly in the case of the Telesat where there are no co-frequency, co-coverage operations with those of Panasonic supported by other satellite operators within +/-6° of the Telstar 14 satellite (including those of Row 44).⁵³

Second, Row 44 mischaracterizes the additional technical information required by the Commission under Section 25.220. This information provides the Commission with technical data necessary to execute its regulatory mandate, rather than providing “the technical underpinning for [the satellite operator] coordination letters.”⁵⁴ In fact, Panasonic’s satellite operators have examined significantly greater technical information than required by this rule in the context of coordinating Panasonic’s AMSS operations – much of which is proprietary. It would be contrary to the public interest to require such information to be submitted in the context of earth station application proceedings.

Finally, Row 44 appears to suggest that the Panasonic’s AMSS application should not be granted because it has not yet concluded coordination with NASA. The Panasonic application expressly states that it will adhere to exclusion zones similar to those imposed on other mobile VSAT operations to protect TDRSS operations during the pendency of coordination discussions.⁵⁵ As those analogous requirements indicate, the Commission can grant Ku-band mobile VSAT applications subject to compliance with those provisions or subsequently executed coordination agreements. Panasonic would note, in any event, that it is on the verge of finalizing

⁵³ See Affidavit of Telesat Canada dated November 12, 2010 (Attachment B). Panasonic included the prior Telesat affidavits to satisfy the Commission and interested parties that Telesat had reviewed Panasonic’s proposed AMSS operations and will take them into account in future satellite coordinations.

⁵⁴ Petition at 7.

⁵⁵ Panasonic AMSS Application at 5, 17-18; see 47 C.F.R. §§ 25.222(c) and 25.226(c).

the coordination agreement with NASA and will submit the agreement in the record of this proceeding shortly.

4. Although Sections 25.218, 25.222 and 25.226 Are Not Directly Applicable, Panasonic Has Demonstrated Compliance To Provide Additional Assurance that the eXConnect System Can Operate In a Two-Degree Spacing Environment

Although not required to support its AMSS application, Panasonic referenced the permissible off-axis EIRP spectral density levels included in Sections 25.118, 25.222 and 25.226 of the rules to generally demonstrate compliance with the Commission's two-degree spacing policies. Row 44 does not challenge whether Panasonic's proposed AMSS operations will comply with these levels, but rather that Panasonic has not submitted the specific technical data required by these rules. Of course, Row 44 fails to recognize that Panasonic has incorporated the extensive technical record of the prior MELCO licensing proceeding, which was deemed sufficient to grant operating authority for that AES terminal.

In addition, as discussed in Section II *supra*, the Panasonic AMSS application is being considered under Section 25.220 of the rules and reference to Ku-band off-axis EIRP spectral density masks does not alter the actual licensing requirements. There is more than enough information in the record for the Commission to conclude that eXConnect operations will comply fully with off-axis EIRP levels designed to facilitate non-interference operations in a two-degree spacing environment. Panasonic also requested a waiver of the Commission's rules because certain information is not available on these installed AES terminals, and provided sufficient basis for grant of such a waiver to the extent required.

IV. PANASONIC WILL COMPLY WITH SPECIAL CONDITIONS PREVIOUSLY IMPOSED ON U.S. AMSS LICENSEES

Panasonic expressly acknowledges and accepts that in addition to compliance with the operating specifications set forth in its AMSS application and general compliance with the Commission's rules (except insofar as waived), eXConnect AMSS operations may be subject to additional conditions, including:

- eXConnect AES operations must be in compliance with any rule requirements subsequently adopted by the Commission.
- Panasonic must accept interference from lawful operation of any station in the 11.7-12.2 GHz band in accordance with the U.S. Table of Frequency Allocations, 47 C.F.R. § 2.106, and must immediately terminate operation upon notification that such operation is causing harmful interference to, or not permitted under the terms of a coordination agreement with, lawful operation of any radio system in the 11.7-12.2 GHz band in conformance with the U.S. Table of Frequency Allocations.
- In the event that another co-frequency GSO FSS satellite commences operation at a location within 6° of one of Panasonic's serving satellites, the serving satellite operator must coordinate with the operator of that satellite. Absent a coordination agreement, Panasonic must cease operation of its AMSS system unless it can show that it will not cause harmful interference to that co-frequency FSS satellite.
- In the event that a co-frequency NGSO satellite system commences operation, the operators of Panasonic's serving satellites must coordinate with the operator of that satellite system. Absent such coordination agreements, Panasonic must cease operation of the eXConnect AMSS system unless Panasonic can show that it will not cause harmful interference to that co-frequency NGSO satellite system.
- Panasonic must immediately terminate AMSS operation upon notification that such operation is causing harmful interference to, or not permitted under the terms of coordination agreements with: (i) lawful operation of any radio system in the 14.0-14.5 GHz band authorized on a primary basis in conformance with the U.S. Table of Frequency Allocations or authorized on a secondary basis prior to the effective date of a Commission licensing order; (ii) operation of any TDRSS earth station in the band 14.0-14.2 GHz; or (iii) radio astronomy observations in the 14.47-14.5 GHz band.
- Panasonic must maintain a point of contact available 24 hours per day, seven days per week, with the authority and ability to cease transmissions and address interference concerns with other licensees and U.S. Government agencies; and must submit a letter to be included in its license file with the name and telephone number of the point of contact prior to commencing operation.

- eXConnect AES terminals must employ a tracking algorithm that is resistant to capturing and tracking adjacent satellite signals, and each station must be capable of inhibiting their own transmission in the event they detect unintended satellite tracking.
- eXConnect AES terminals must be monitored and controlled by a ground-based network control and monitoring center. Such AES terminals must be able to receive "enable transmission" and "disable transmission" commands from the network control center and must cease transmission immediately after receiving any "parameter change" command until receiving an "enable transmission" command from the network control center. The network control center will monitor operation of each AES terminal to determine if it is malfunctioning, and each AES terminal will self-monitor and automatically cease transmission on detecting an operational fault that could cause harmful interference to an FSS network.
- eXConnect operations in the 11.7-12.2 GHz band shall be in accordance with the space station authorization for Panasonic's serving satellites.
- eXConnect AES terminals shall not be used to provide air traffic control communications.
- The eXConnect AMSS system shall operate in compliance with any limits established by the International Telecommunication Union (ITU) to protect other services allocated internationally.
- eXConnect AMSS operations shall conform to the requirements of Panasonic's coordination agreements with NASA (once executed), NSF and operators of Ku-band geostationary satellites within six angular degrees of its serving satellites.
- For a period of one year from release of any Commission licensing order, Panasonic must maintain records of the following data for each operating eXConnect AES terminal: location (latitude, longitude, altitude); aircraft attitude (pitch, yaw, roll); transmit frequency and occupied bandwidth; data rate; EIRP; and target satellite. This data shall be recorded at intervals of no more than two minutes while an AES terminal is transmitting and every 30 seconds when aircraft roll angle is greater than 10°. Panasonic must also record instances when AES pointing error exceeds 0.25° 1-sigma as specified in its AMSS application. Panasonic will make this data available upon request to an FSS system operator or the Commission within 24 hours after receiving the request.
- Panasonic must take all reasonable and customary measures to prevent human exposure to harmful non-ionizing radiation exceeding the maximum permissible exposure limits in Section 1.1310 of the Commission's rules, 47 C.F.R. § 1.1310. The exterior surface of the eXConnect AES terminal shall be prominently marked with a warning of the potential for exposure to high levels of radiofrequency energy.⁵⁶

⁵⁶ See Row 44 Order at ¶35.

V. CONCLUSION

As discussed herein, Panasonic's AMSS application is fully consistent with Section 25.220 of the rules and the Commission's Ku-band AMSS licensing policies and precedent. Grant of this AMSS application would strongly serve the public interest by enhancing competition in aeronautical communications services and maintaining U.S. leadership in advanced broadband technologies. The Commission has previously authorized the operation of the MELCO AES terminal (with a higher power spectral density) and these terminals installed on Lufthansa aircraft have operated on a trial basis for nearly a year with no reported cases of interference. Finally, the instant response of Panasonic has fully addressed the issues raised in the lone petition filed in this proceeding.

In view of the foregoing, the Commission should grant Panasonic's application for blanket license authority to operate the eXConnect System on a commercial basis at the earliest practicable time.

Respectfully submitted,

PANASONIC AVIONICS CORPORATION

By:  _____

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November 15, 2010

Technical Certificate

I, Paul Sarraffe, hereby certify that I am the technically qualified person responsible for the preparation of the technical discussion contained in Panasonic Avionics Corporation's Response to Petition of Row 44, Inc., that I am familiar with Part 25 of the Commission's Rules (47 C.F.R. Part 25), and that I have either prepared or reviewed the technical information submitted in this Response to Petition of Row 44, Inc. and found it to be complete and accurate to the best of my knowledge and belief.

By: Paul Sarraffe

Paul Sarraffe
Panasonic Avionics Corporation
eXConnect Systems Engineering

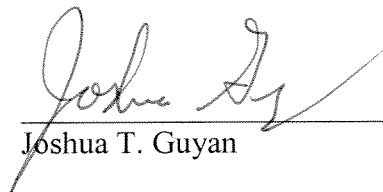
November 15, 2010

Certificate of Service

I, Joshua T. Guyan, hereby certify that on this 15th day of November, 2010, I caused a copy of Panasonic Avionics Corporation's Response to the Petition of Row 44, Inc. to be served via U.S. first class mail on the party listed below.

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