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October 4, 2012

**VIA ELECTRONIC FILING**

Marlene H. Dortch  
Secretary  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, DC 20554

**Re: Application for License Modification of Panasonic Avionics Corporation;  
File No. SES-MFS-20120913-00818, Call Sign E100089; Satellite Operator  
Certifications**

Dear Ms. Dortch:

Panasonic Avionics Corporation (“Panasonic”), pursuant to Section 1.65 of the Commission’s Rules, 47 C.F.R. § 1.65, hereby submits the enclosed satellite operator certifications supporting international operations of the eXConnect Ku-band AMSS network proposed in the above-referenced license modification application.

Panasonic encloses certifications from operators of two satellites it seeks to add as authorized points of communication: SKY Perfect JSAT Corporation, operating Superbird C2 and Gazprom Space Systems, operating Yamal-201. Similar to the certifications of other satellite operators filed with the Commission on October 1, 2012, these submissions also confirm that Panasonic’s planned operations fall within the operating parameters previously coordinated with adjacent satellite operators and, where foreign aircraft operations with a satellite have already commenced, confirm that there have been no reported cases of unacceptable interference relating to Panasonic’s operation of the eXConnect system. Additional certification letters from remaining satellite operators will be provided shortly.

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Please feel free to contact the undersigned with any questions you may have or if Panasonic can provide any additional information to facilitate expeditious action on its application.

Respectfully submitted,

Squire Sanders (US) LLP

*/s/ Carlos M. Nalda*

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Carlos M. Nalda

*Counsel to Panasonic Avionics Corporation*

cc: Paul Blais, FCC International Bureau  
Stephen Duall, FCC International Bureau

October 3, 2012

Federal Communications Commission  
International Bureau  
445 12th Street, S.W.  
Washington, D.C. 20554

To Whom It May Concern:

This letter certifies that SKY Perfect JSAT Corporation (“JSAT”) is aware that Panasonic Avionics Corporation (“PAC”) is seeking FCC authorization to access Superbird C2 at 144° E.L. as an authorized point of communication for its eXConnect Ku-band aeronautical mobile-satellite service (“AMSS”) system using transmit/receive antennas that are not strictly compliant with the FCC’s antenna gain requirements.<sup>1</sup> In addition, as described below, it is desired to operate at higher off-axis EIRP spectral density levels on Superbird C2 than the FCC’s two-degree spacing rules and these levels comply with the coordinated off-axis EIRP spectral density levels of this satellite.

JSAT understands that PAC will soon operate the Aura LE AES terminal designed specifically for the eXConnect system on the Superbird C2 satellite. JSAT also understands that the Aura LE is a mechanically steered, flat-plate AES with two transmit/receive apertures that is similarly designed to meet the technical requirements imposed on U.S. and international AMSS operations. The basic characteristics of the Aura LE AES are summarized in Table 1.

**Table 1. Aura LE Antenna Characteristics**

<b>Characteristic</b>	<b>AuraLE</b>
Frequency	Tx: 14.0 GHz to 14.5 GHz Rx: 10.7 GHz to 12.75 GHz
Aperture Size	2 Apertures of 34.7" X 6.6" each
EIRP	48.0 dBW
G/T	10-14 dB/K
Tracking Rate	40 deg/sec in Azimuth 20 deg/sec in Elevation
Az Pointing Accuracy	0.2 deg 1-sigma

Based on our review of the technical specification and conversations with PAC, JSAT further understands that the Aura LE antenna is designed to maintain pointing towards the intended satellite through the full range of maneuvers carried out by commercial aircraft. The antenna is pointed based on aircraft position and attitude information obtained from the ARINC 429 data bus, which is standard on commercial aircraft. This information is augmented with higher rated data from an inertial sensor package that is integrated with the antenna and compensates for INS errors

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<sup>1</sup> See 47 CFR §25.209.

that result from latency and bending of the airframe between the aircraft INS unit and the antenna. The pointing accuracy of the Aura LE will be less than  $0.2^\circ$  1-sigma. Pointing error will be continuously monitored and if it ever exceeds  $0.35^\circ$ , then transmissions will be automatically inhibited within  $100 \text{ ms}^2$ .

It is recognized that the off-axis EIRP spectral density limits applied to AMSS operations in the region that have adopted two-degree satellite spacing are the same as those defined by FCC for ESV and VMES operations. This means that the off-axis EIRP spectral density generated by an AMSS terminal operating in this region should not exceed:

15-25log10( $\Theta + 0.2$ )	dBW/4 kHz	for	$1.5^\circ \leq \Theta \leq 7^\circ$
-6	dBW/4 kHz	for	$7^\circ < \Theta \leq 9.2^\circ$
18-25log10( $\Theta + 0.2$ )	dBW/4 kHz	for	$9.2^\circ < \Theta \leq 48^\circ$
-24	dBW/4 kHz	for	$48^\circ < \Theta \leq 85^\circ$
-14	dBW/4 kHz	for	$85^\circ < \Theta \leq 180^\circ$

where  $\Theta$  is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite. However, in other regions, such as the regions covered by Superbird C2 (*i.e.*, Asia-Pacific regions) where larger orbital spacing is the norm, JSAT and PAC believe that the off-axis EIRP spectral density limits may be up to 6 dB higher.

JSAT has been advised by PAC that the eXConnect system will limit off-axis EIRP spectral density to the above-mentioned levels for the Superbird C2 satellite through various means, including: (i) limiting transmit power spectral density by controlling the transmit power of the terminal and by selecting appropriate carrier bandwidths; (ii) controlling the off-axis gain of the antenna along the GSO by inhibiting transmissions when the skew angle exceeds a specified threshold and (iii) controlling pointing error and inhibiting transmissions when the pointing offset exceeds a threshold of  $0.35$ . The specific transmit power, bandwidth and skew angle thresholds will be selected based on the desired terminal transmission rates, coverage area, and satellite performance.

JSAT has been also advised by PAC that the Aura LE antenna will be installed in compliance with the technical, operational and performance requirements of Part 25 of the FCC rules and any requirements set forth in the licenses granted by the FCC for the above AMSS antenna system (except for the above-mentioned off-axis spectral EIRP density limits). If the use of this antenna should cause unacceptable interference into other systems, PAC has agreed that it will terminate transmission immediately upon notice from the affected parties.

Based on the foregoing factors and discussions with PAC, JSAT understands that the Aura LE antenna will operate at an effective maximum input power density at the antenna waveguide flange of  $-23.3 \text{ dBW} / 4 \text{ kHz}$ , assuming an antenna gain of  $37 \text{ dBi}$  and employing BPSK modulation. At all times, the maximum operational transmit power level of the terminal is consistent with the Commission's two-degree spacing limit and off-axis EIRP spectral density levels are consistent with the coordinated values of the Superbird C2 satellite. PAC takes advantage of larger orbital spacing and/or coordination priority by operating at larger skew angles to increase the geographic coverage area of its service.

Even in the rare circumstance when transmitting at maximum pointing offset, JSAT believes that transmissions by this terminal is compliant with the applicable off-axis EIRP density level agreed on coordination with potential affected satellites up to and including 6° off-axis. PAC's conservative approach of including antenna pointing offsets in selecting the maximum power levels defined above ensures that the operation of the Aura LE, with the associated off-axis EIRP density envelope for each satellite point of communication, will not cause unacceptable interference into adjacent satellites.

In view of the foregoing and additional consultations between JSAT engineering staff and PAC, JSAT hereby confirms that the eXConnect phased-array AMSS terminal operations on the Superbird C2 satellite described above (i.e. including 6 dB higher off-axis EIRP spectral density limits), will fall within the operating parameters previously coordinated with adjacent satellite operators, and then will not cause unacceptable interference into other operations on Superbird C2, or adjacent satellites, and is otherwise in accordance with SJC's technical requirements.

JSAT further confirms that the maximum downlink satellite EIRP density of the Ku-band AMSS network operated by PAC on Superbird C2 will fall within the operating parameters previously coordinated with adjacent satellite operators, and then will not cause unacceptable interference to adjacent satellite operators.

Please let me know if you require any additional information regarding PAC's future operation of the eXConnect phased-array AMSS terminal on the Superbird C2 satellite.

Sincerely,

  
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Mitsuru Ishii  
General Manager  
Mobile Business Division  
SKY Perfect JSAT Corporation

  
\_\_\_\_\_

Date



**ОТКРЫТОЕ  
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«04» 10 2012

№ П/К-04/6942

**Mark DeFazio**

**Director, GCS Business Operations and Planning  
26200 Enterprise Way  
Lake Forest, 92630**

Dear Mr. DeFazio:

Following your request, Gazprom Space Systems (“GSS”) has reviewed the technical characteristics and the existing experience of using the technical means of Panasonic Avionics Corporation’s (“PAC”) in Ku-band aeronautical mobile-satellite service (“AMSS”) operations with Yamal-201 satellite for their consistency with GSS’s international coordination agreements and the practical absence of unacceptable interference into the adjacent geostationary satellites.

The specified basic characteristics of the eXConnect phased-array AMSS terminal for operation with Yamal-201 satellite at 90°E are presented in the terminal description («APPLICATION FOR LICENSE MODIFICATION»), and include:

1. Basic technical and performance parameters

<b>Characteristic</b>	<b>Aura LE</b>
Frequency	Tx: 14.0 GHz to 14.5 GHz Rx: 10.7 GHz to 12.75 GHz
Aperture Size	2 Apertures of 34.7" X 6.6" each
Max. EIRP	48.0 dBW
G/T	10-14 dB/K
Tracking Rate	40 deg/sec in Azimuth 20 deg/sec in Elevation
Az Pointing Accuracy	0.2 deg 1-sigma

2. In the United States region, RF radiation of AMSS terminal is limited by the off-axis EIRP spectral density, i.e.:

15–25log10( $\Theta + 0.2$ )	dBW/4 kHz	for	$1.5^\circ \leq \Theta \leq 7^\circ$
-6	dBW/4 kHz	for	$7^\circ < \Theta \leq 9.2^\circ$
18–25log10( $\Theta + 0.2$ )	dBW/4 kHz	for	$9.2^\circ < \Theta \leq 48^\circ$
-24	dBW/4 kHz	for	$48^\circ < \Theta \leq 85^\circ$
-14	dBW/4 kHz	for	$85^\circ < \Theta \leq 180^\circ$

where  $\Theta$  is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite. In region of the Russian Federation, where larger orbital spacing is the norm, off-axis EIRP spectral density limits may be coordinated to higher levels.

The main results of the performed analysis:

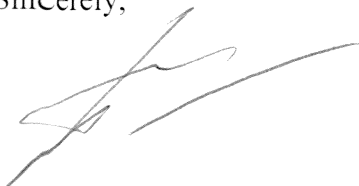
1. AMSS PAC has been operating with Yamal-201 since 01.02.2012. During this period there were no any complaints from other customers operating on Yamal-201 satellite or from adjacent satellite operators.
2. The off-axis EIRP mask does not exceed the required limits coordinated for the EXPRESS-7 (90E) satellite network FSS earth stations and therefore is compliant with the coordination restrictions for EXPRESS-7 (90E) ensuring interference-free operation with the adjacent satellites.
3. GSS has incorporated the technical characteristics of the eXConnect phased-array AMSS terminal into its current operational planning and coordination agreements with adjacent satellite operators for the Yamal 201 satellite at 90° E.L.

The AMSS PAC operations in Russia have to be in line with the Permission of State Commission on Frequency Management of the Russian Federation.

The AMSS PAC operations have to be in line with the provisions 5.504A, 5.504B, 5.504C, 5.508A, 5.509A of the Radio Regulations and the ITU-R Recommendation M.1643.

Based on all above mentioned, GSS confirms that operation of the eXConnect phased-array AMSS terminal will not cause unacceptable interference into other operations on Yamal 201, or adjacent satellites, and is otherwise in accordance with GSS's technical requirements.

Sincerely,



**Peter Korviakov**

**First Deputy Director General**