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July 10, 2009

BY HAND

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

**Re: Applications of Row 44, Inc. (Call Sign E080100);
File Nos. SES-LIC-20080508-00570, SES-AMD-20080619-00826, SES-AMD-
20080819-01074, SES-AMD-20080829-01117, SES-AMD- 20090115-00041, and
SES-AMD-20090416-00501**

**Requests for Special Temporary Authority, FCC File Nos. SES-STA-
20080711-00928; SES-STA-20090417-00507**

Dear Ms. Dortch:

This letter is submitted on behalf of Row 44, Inc. ("Row 44") in response to three recent submissions by ViaSat, Inc. ("ViaSat") concerning the above-referenced application of Row 44 for a license to provide aeronautical mobile-satellite service ("AMSS") in the Ku-band. In particular, this letter responds to ViaSat's June 24 Letter addressing the Row 44 Test Reports filed in April and May,¹ ViaSat's June 26 Letter submitting the presentation made at its June 25 *ex parte* meeting with Satellite Division Staff,² and ViaSat's June 30, 2009 Letter concerning the application of Section 25.220 of the FCC's rules.³

¹ See Letter from John P. Janka and Jarrett S. Taubman, Counsel for ViaSat, Inc., to Marlene H. Dortch, Secretary, FCC, dated June 23, 2009 (filed June 24, 2009) ("ViaSat 6/24 Letter"). Although the ViaSat 6/24 Letter is dated June 23, 2009, it is Row 44's understanding that it was in fact filed with the FCC on the morning of Wednesday, June 24, 2009. Row 44 did not receive an unredacted copy of this letter until Friday, June 26, 2009, and did not receive the actual service copy by mail until Monday, June 29, 2009 (postmarked June 24, 2009).

² See Letter from John P. Janka and Jarrett S. Taubman, Counsel for ViaSat, Inc., to Marlene H. Dortch, Secretary, FCC, dated June 26, 2009 ("ViaSat 6/26 Ex Parte Notice").

³ See Letter from John P. Janka and Jarrett S. Taubman, Counsel for ViaSat, Inc., to Marlene H. Dortch, Secretary, FCC, dated June 30, 2009 ("ViaSat 6/30 Letter").



Ms. Marlene Dortch
 July 10, 2009
 Page 2 of 20

Both the ViaSat 6/24 Letter and the ViaSat 6/26 Ex Parte Notice recapitulate once more the myriad assertions that ViaSat has made in this proceeding previously. A critical flaw in ViaSat's approach, however, is that it treats all questions and comments previously raised in this proceeding as if they have simply accumulated over time, like silt, to create a barrier to final FCC action. But this twisting of reality ignores the multiple submissions that Row 44 has made that have provided answers to all questions posed by FCC staff, or have refuted the arguments interposed by ViaSat. ViaSat's approach is therefore very misleading and appears intended to engender regulatory delay rather than assist the International Bureau ("Bureau") in resolving this proceeding.⁴

Indeed, the ViaSat 6/24 Letter contains multiple misstatements of fact that undermine ViaSat's credibility. For example, in an apparent effort to obscure the fact that ViaSat itself is the only party consistently participating in this proceeding in opposition to grant of the Row 44 application,⁵ ViaSat continues to refer to The Boeing Company ("Boeing") as if it were supportive of ViaSat's objections. ViaSat 6/24 Letter at 2. In fact, Boeing made plain *more than 8 months ago*, following technical discussions with Row 44, that it had no issues with Row 44's proposal, stating as follows:

Based on its extensive experience and expertise in AMSS network design and the information made available, Boeing has concluded that the technical and operational measures that Row 44 described in its October 23, 2008 submission should obviate the concerns that Boeing expressed regarding harmful interference to authorized users of the 14.0-14.5 GHz band.⁶

Boeing went on to conclude that "processing Row 44's STA and full license request is in the best interests of the aviation and satellite industries, as well as the traveling public."⁷ Accordingly, ViaSat's reference to Boeing as sharing ViaSat's concerns about alleged "deficiencies" in Row 44's technical showing is demonstrably false.

⁴ In this regard, it is also notable that ViaSat allowed forty days to elapse between the time it received both Row 44 Test Reports on May 14, 2009 and the filing of its June 24, 2009 Letter. Were the matters addressed in this filing of as substantial concern as ViaSat's rhetoric intimates, one would have expected a far less dilatory response. In contrast, Row 44 submitted its required Flight Test Report more than thirty days in advance of the June deadline established by the FCC, and just 18 days after the completion of testing.

⁵ Other participation in this proceeding in support of ViaSat has been limited to a few brief letter filings by ViaSat's business associates and other competitors of Row 44 that have simply parroted ViaSat's assertions in summary fashion. See Letter from David Keir, Counsel to Row 44, to Marlene H. Dortch, Secretary, FCC, at 2 & n.4 (dated February 11, 2009).

⁶ Letter from Bruce Olcott, Counsel to Boeing, to Marlene H. Dortch, Secretary, FCC, at 1 (filed November 3, 2008).

⁷ *Id.* at 2; see also Letter from Bruce Olcott, Counsel to Boeing, to Marlene H. Dortch, Secretary, FCC, at 1 (filed February 19, 2009) (reiterating its support and urging Bureau "to grant expeditiously Row 44's applications").



Ms. Marlene Dortch
 July 10, 2009
 Page 3 of 20

Similarly misleading is ViaSat’s repetition of the false allegation that Row 44 operated “without authorization in the U.S. for a number of months.” ViaSat 6/24 Letter at 2. This contention was thoroughly debunked by Row 44 many months ago.⁸ Also incorrect is ViaSat’s vehement assertion that it’s December 2008 “interference analysis” is “*unrebutted to this day.*” ViaSat 6/24 Letter at 6 (emphasis original). That thoroughly flawed analysis was refuted almost five months ago in a filing that ViaSat seems unprepared even to acknowledge.⁹

Both the tenor and content of ViaSat’s most recent submissions suggest simple frustration that the chief objective of Row 44’s in-flight testing program was not, as ViaSat apparently would have preferred, the disclosure of additional proprietary design elements of Row 44’s AMSS system. Instead, Row 44 has sought to establish that its remote terminals can operate under actual flight conditions without causing harmful interference to adjacent satellites. This inquiry is indisputably the central issue in this proceeding, and one which Row 44 has conclusively shown can be resolved in its favor.

Thus, ViaSat’s scattershot list of what it subjectively characterizes as “unresolved material questions of fact” is an analysis that deliberately misses the point, failing to focus on the principal non-harmful-interference question that Row 44 has addressed. Indeed, ViaSat’s filing is most notable for what it does not contain – any claim, let alone a showing, that harmful interference has been caused to ViaSat, or to anyone else, by Row 44’s operations. This conclusion is buttressed by the absence of any other active opposition to Row 44’s application and the support for final action provided by the satellite operators who would be potentially most affected by harmful interference, EchoStar Corporation, Intelsat, and SES Americom, Inc. (“Satellite Operators”). See Statement of Satellite Operators, filed June 19, 2009.

For these reasons, in addition to those further detailed below and in its June 16, 2009 meeting with Satellite Division staff, Row 44 urges the Bureau to act expeditiously on Row 44’s application, granting it a license to provide new AMSS service to the public in the Ku-band.

⁸ See Letter from David Keir, Counsel to Row 44, to Marlene H. Dortch, Secretary, FCC, at 3 (dated September 26, 2008).

⁹ See Letter from David Keir, Counsel to Row 44, to Marlene H. Dortch, Secretary, FCC, at 6-7 (dated February 11, 2009). In addition, the error values in Table 2 of Viasat’s analysis were arbitrarily high and unreasonably discounted Row 44’s implementation that compensates for these errors, leading to an invalid conclusion that excessive pointing error would occur, when actual, observed measurements prove otherwise. See Letter from John P. Janka, et al., Counsel to ViaSat, to Marlene H. Dortch, Secretary, FCC, dated December 8, 2008, Exhibit 1: Interference Analysis at 5 (Table 2).



1. Row 44 Has Demonstrated Compliance with the Commission’s Pointing Accuracy Standard.

A. The Information Provided By Row 44 Concerning Its Antenna Pointing Mechanism Is More Than Sufficient.

It is important to note at the outset that the antenna pointing accuracy standard that has become the centerpiece of ViaSat’s repetitive and voluminous technical arguments in this proceeding is a simple benchmark, the intent of which is to establish a basis for concluding that mobile-satellite service (“MSS”) earth station operators providing service in the Ku-band can operate without causing harmful interference to other spectrum users. Neither the ITU, in connection with the adoption of Resolution 902, nor the FCC, in adopting Section 22.222, both of which pertain specifically to earth stations on vessels (“ESV”), adopted detailed technical evaluation criteria to analyze how the $\pm 0.2^\circ$ antenna pointing accuracy standard is met, and accordingly, no such detailed analysis of the specific mechanisms employed to meet this standard has been applied by the Bureau in any of the AMSS applications granted to date.¹⁰

The showing made by Row 44 in its initial application, as supplemented by later filings, was therefore sufficient to establish compliance with the ± 0.2 degree peak pointing accuracy benchmark. This fact notwithstanding, Row 44 provided additional corroborative data to FCC staff last Fall,¹¹ including a detailed in-person presentation,¹² as well as additional test data submitted in April and May of this year.¹³ ViaSat’s efforts to extract more information from Row 44 on “precisely how” these mechanisms work seems calculated not to elicit information required to process Row 44’s application, but rather to obtain access to the proprietary design specifications of a competitor. The central question that the Bureau must answer here is not “precisely how” Row 44’s technology functions, but whether it can comply with the pointing accuracy requirements of the FCC’s rules in a manner that avoids harmful interference to other

¹⁰ See, e.g., *ViaSat, Inc.*, 22 FCC Rcd 19964, 19969 (¶ 16) (IB/OET 2007) (“*ViaSat AMSS License Order*”) (“Based on review of the subject application, we conclude that operation of the Arclight AMSS system would satisfy these proposed requirements”); *ARINC Incorporated*, 20 FCC Rcd 7553, 7567 (¶ 41) (IB/OET 2005) (“*ARINC AMSS License Order*”) (“We agree with ARINC that Boeing’s counter estimate is irrelevant and conclude that ARINC has adequately accounted for pointing error”).

¹¹ See *Opposition of Row 44, Inc. to Supplement to Petition to Deny of ViaSat, Inc.*, Technical Annex, filed October 23, 2008.

¹² See Letter from David S. Keir, Counsel to Row 44, to Marlene H. Dortch, Secretary, FCC (dated November 26, 2008), Attachment (providing notice of November 25, 2008 *ex parte* presentation).

¹³ See “Report Concerning Pointing Accuracy Ground Testing of the HR6400 Antenna System for Aeronautical Mobile-Satellite Service,” filed April 13, 2009 (“Ground Test Report”); “Satellite Interference Test Plan and Report: Row 44 Satellite Broadband System,” filed May 11, 2009 (“Flight Test Report”).



service providers in the Ku-band. Row 44 has adequately demonstrated such compliance, both on paper in its filings with the FCC and, much more importantly, in flight, through its testing program in cooperation with all three major U.S. Satellite Operators.

B. ViaSat's Key Assertions Regarding Row 44's System Performance Are Based on Faulty Assumptions or Mischaracterizations of the Record.

Notwithstanding the foregoing discussion, and despite the irrelevance to Row 44's application of much of ViaSat's presentation, it is nonetheless necessary for Row 44 to correct the record, in some cases for the second or third time, with respect to several material distortions advanced by ViaSat.

(1) Row 44's System is Designed to Cease Transmission at ± 0.2 degrees Mispoint.

As Row 44 has previously explained, however, it has designed its system to cease transmission at $\pm 0.2^\circ$ peak detected mispoint,¹⁵ which provides ample margin to ensure avoidance of harmful interference. Even if Row 44's operations did marginally exceed $\pm 0.2^\circ$ mispointing, this is entirely consistent with the Commission's rules (which allow a mispoint of up to $\pm 0.5^\circ$ before cessation of transmission is required), and Row 44's commitment to a peak $\pm 0.2^\circ$ pointing accuracy ensures that all aspects of Section 25.222(a)(6) will be met. *See* 47 C.F.R. § 25.222(a)(6).

ViaSat's assertions and concerns about the "closed-loop tracking mechanism" are unfounded.¹⁶ Under all operating modes, including during tracking, Row 44's antenna gain does not exceed the Section 25.209 mask, and the transmitted power spectral density does not exceed the power spectral density mask of Section 25.222 while the transmitter is enabled. *See* 47 C.F.R. §§ 25.209 & 25.222.

Row 44 reaffirms the commitment that this system complies with Sections 25.222(a)(5), 25.222(a)(6), and 25.222(a)(7).¹⁷

¹⁵ *See* Row 44 Response to August 7, 2008 FCC Letter, SES-AMD-20080819-01074, at 1; Row 44 Response to August 25, 2008 FCC Letter, SES-AMD-20080829-01117, at 1-2 (item 1(b)).

¹⁶ *See* ViaSat 6/24 Letter at 10 & 12; ViaSat 6/26 *Ex Parte* Notice at 6.

¹⁷ *See* 47 C.F.R. § 25.222(a). *See also* Opposition of Row 44, Inc. to Supplement to Petition to Deny of ViaSat, Inc., Technical Annex at 9-10 (filed October 23, 2008).



(2) Row 44’s System Tracks Orientation in All Three Axes. ViaSat has also maintained, without foundation, that Row 44’s antenna system does not have the capability “to track in all three axes relevant with respect to a moving airplane (i.e., pitch, yaw and roll).” ViaSat 6/24 Letter at 3. As ViaSat likely knows, an Azimuth/Elevation/Polarization antenna is perfectly capable of pointing at the desired satellite under nearly any condition of latitude, longitude, pitch, roll, and heading limited only by mechanical limitations such as airframe blockage. The design requirement is maintaining compliance with Section 25.222(a)(5), keeping the EIRP compliant as the antenna aperture misaligns from the GSO arc. By defining a compliant Operating Envelope and executing real-time tracking of aircraft dynamic motion, transmission can be inhibited as soon as the bounds of this envelope are reached.

As Row 44 has previously noted, it employed a three-dimensional (heading, pitch, and roll) motion table for system integration of the AeroSat antenna, allowing characterization of Operating Envelope tracking and antenna pointing performance in all three axes. The motion table employed is capable of exceeding worst-case Air Transport Category aircraft dynamics while providing positional data accurate to better than 0.01 degrees in all three axes. This table was driven using flight profiles with both worst case and real world flight dynamics. Results included tests for both pointing accuracy and transmit shutdown cases when the parameters of the operating envelope have been exceeded or faults are detected.

(3) Row 44’s System Accounts for Pointing Performance in the Elevation Plane. In addition, ViaSat has asserted that Row 44 has “failed to analyze pointing performance in the elevation plane.” ViaSat 6/24 Letter at 15. In fact, as stated in the Ground Test Report,

¹⁹ Because Row 44 utilizes a low-profile airborne antenna with a narrow beamwidth in azimuth, it necessarily has a wider beamwidth in elevation. Row 44 is cognizant of the potential impact of beam “tilt”, or “skew,” into the GSO arc, such that its system architecture provides for the major axis of the antenna to be aligned with the tangent to the GSO arc at the target satellite point to the extent required to prevent the wider elevation beam from interfering with adjacent satellites, ensuring that the specified off-axis EIRP criteria, as set forth in Section 25.222(a)(5) of the FCC’s Rules, are met. *See* 47 C.F.R. § 25.222(a)(5). The major axis of rotation of the aperture of Row 44’s airborne antenna is fixed relative to the yaw axis of the aircraft, therefore the antenna alignment is a direct function of the aircraft orientation in all three axes (pitch, roll, and heading) and will vary as the aircraft experiences geographical and orientation changes during flight. Because the Antenna

¹⁸ *See* Flight Test Report at 31-49.

¹⁹ Ground Test Report at 1.



Control Unit itself does not directly drive the antenna aperture in the GSO-arc-alignment axis, the angle between the GSO arc and the antenna aperture is continuously calculated and monitored to prevent transmission in situations where the energy contributed by the elevation antenna pattern could cause adjacent satellite interference.

Row 44 reaffirms that at all times, and under all conditions of flight, transmissions are only enabled when all system parameters show that the emissions in the direction of the GSO arc will comply with Section 25.222(a)(5) of the FCC's Rules. *See* 47 C.F.R. § 25.222(a)(5).

Viasat has repeatedly attempted to discredit Row 44's compliance with the requirements presented in Sections 25.209 and 25.222 of the FCC's Rules. In fact, Row 44 has demonstrated its compliance with the off-axis EIRP spectral density co-polarization and cross-polarization paragraphs in Sections 25.222(a)(10) and 25.222(a)(4), and the antenna performance in Sections 25.209(a)(1) and 25.209(b), even under circumstances of 0.2 degrees peak mispointing and ± 25 degrees maximum misorientation.²¹ Given that a mask-compliant antenna could expect be mispointed by an additional 0.2 degrees and not require shutdown of transmission until a mispoint of 0.5 degrees, this worst-case design criteria provides additional pointing error margin for interference prevention. While Row 44 has noted that it does not comply with the specific elevation plane requirements identified in Sections 25.222(a)(2) and 25.209(a)(2), the radiated energy resulting from this limitation occurs in directions outside of the GSO arc and therefore has no impact on GSO satellites when antenna alignment is maintained as provided by the Row 44 system. Row 44 reaffirms that any contribution from the non-compliant elevation pattern, even under simultaneous worst case mispointing and misorientation, is included in the antenna alignment and compliance determination.²²

(4) Row 44's System Power Levels Comply With the FCC's Standards for Existing Mobile Applications Operating in the Ku-Band. Viasat has continued to question Row 44's RF power levels and control, EIRP and power density. ViaSat 6/24 Letter at 3. Row 44 has consistently stated that its maximum EIRP at beam peak is 38.6 dBW with an off-axis EIRP spectral density that is compliant with Section 25.222(a)(1).²³ This EIRP level is obtained from

²⁰ *See* Flight Test Report at 31-49.

²¹ *See* 47 C.F.R. §§ 25.209 & 25.222. *See* Row 44 Response to August 25, 2008 FCC Letter, SES-AMD-20080829-01117, at Attachment 2.

²² *See* Letter from David S. Keir, Counsel to Row 44, to Marlene H. Dortch, Secretary, FCC, Attachment at 4-5 (dated November 26, 2008) (providing notice of November 25, 2008 *ex parte* presentation).

²³ *See* 47 C.F.R. § 25.222 (a)(1). *See also* Row 44 Response to August 7, 2008 FCC Letter, SES-AMD-20080819-01074, at 15 & Attachment at 1 (item 1); Row 44 Response to August 25, 2008 FCC Letter, SES-AMD-20080829-01117, at 3 (item 5).



Ms. Marlene Dortch
 July 10, 2009
 Page 8 of 20

measured antenna gain performance compliant with Section 25.209(a)(1), known RF cable losses and a 10 watt transmit power produced by a High Power Transceiver under modem control.²⁴ In addition, the power density at the antenna flange has been identified as -14 dBW/4kHz in compliance with Section 25.134(a)(1). *See* 47 C.F.R. § 25.134(a)(1). Unlike a CDMA system where power is aggregated due to multiple simultaneous transmissions and power control is essential to its operation, Row 44's TDMA protocol ensures that only one transmission is sent on a given frequency at a time, obviating the need for sophisticated power control schemes.

(5) Row 44's System Relies on Tracking Data Generated by the Modem Every 10 Milliseconds. ViaSat has also asserted that the Row 44 system's capability to shut off within 100 milliseconds of detecting an antenna mispoint is compromised because it "produces a single sample only once every 100 milliseconds." ViaSat 6/26 Ex Parte Letter at 10. ViaSat's characterization of the capability of the Row 44 system in this regard is simply incorrect. As Row 44 has previously stated on many occasions, this modem data is the fail-safe back-up to detecting a mispointing event. The primary method of detecting mispointing events comes from monitoring the antenna position, aircraft location (latitude, longitude) and orientation (pitch, roll, and heading) every 10 milliseconds, and this data is used to calculate the antenna alignment, and the actual and required antenna axis trajectories.²⁵ Because the antenna axis trajectory is updated at a 10 millisecond rate, while the antenna position with respect to the trajectory is monitored at rates exceeding one millisecond, compliance with a 100 millisecond shutdown requirement is assured.²⁶

2. Row 44 Has Submitted Complete and Accurate Results of Its Ground and Flight Testing

Notwithstanding the fact that Row 44's initial explanation of its antenna pointing accuracy was sufficient to allow the Bureau to act favorably on its application, Row 44 has gone the extra mile by establishing conclusively under actual operating conditions that its operations will not impinge on other services operating in the Ku-band. Faced with the inability to show that any of Row 44's STA operations have resulted in harmful interference, ViaSat attempts instead to attack both Row 44's testing methodology and the presentation of results provided to the FCC.

²⁴ *See* 47 C.F.R. § 25.209(a)(1). *See also, e.g.*, Row 44 Response to August 25, 2008 FCC Letter, SES-AMD-20080829-01117, at 3 (item 5).

²⁵ *See, e.g.*, Row 44 Response to August 7, 2008 FCC Letter, SES-AMD-20080819-01074, Attachment at 2 (item 3).

²⁶ *Compare* ViaSat AMSS License Application, Revised Technical Annex at 22-23.



A. ViaSat Mischaracterizes Critical Aspects of Row 44’s Testing Program.

(1) ViaSat’s Methodological Criticisms Are Misplaced.

ViaSat’s criticisms of Row 44’s methodology,²⁷ which were initially raised prior to the grant of Row 44’s STA premised on the February 6, 2009 Flight Test Plan, appear to arise from a significant mischaracterization of the Flight Test Plan that Row 44 formulated with input from the Satellite Operators. Contrary to ViaSat’s mistaken characterization, the intent of this plan was not to measure antenna mispointing while in flight, but as Row 44 stated at the outset, “to assess whether the system satisfies predicted non-interference performance.”²⁸ Accordingly, the Test Plan was not designed to measure the actual pointing of the Row 44 antenna while in flight, as ViaSat erroneously maintains, but to demonstrate that the ultimate objective of the antenna pointing guideline is met because the Row 44 system does not cause harmful interference into the transponders of adjacent satellites. As detailed below, measurements were not taken on board the aircraft, but on the ground, assessing whether any observable interference was occurring to co-frequency or adjacent frequency transponders on adjacent satellites.²⁹

(2) The Data Collected By Row 44 Is More Than Sufficient.

Also misplaced is ViaSat’s contention that insufficient data was collected in the course of the flight testing. ViaSat complains that “Row 44 presents data from .” ViaSat 6/24 Letter at 14. But this complaint ignores entirely the test procedure outlined in the Flight Test Plan, which provided for Row 44 to employ its Albatross test aircraft in “maneuvers intentionally to cause excessive antenna misorientation relative to the target satellite and trigger the associated Clarke Belt alarm,” and “to verify in the Antenna Control Unit logs that the transmissions have been muted during alarm conditions,” as well as to collect similar data using a commercial aircraft. Flight Test Plan at 3 (dated February 6, 2009). These are the specific tests for which data is presented in the Flight Test Report.

The particular focus on these controlled system test flights, where extraordinary maneuvers were utilized to trigger multiple muting events, does not devalue in any way the results of the thousands of other flights during which the Satellite Operators also monitored adjacent spacecraft to ensure that no interference events were observed during the Row 44 test flights. There was simply no reason to attempt to catalog specific instances of antenna muting across all of these flights, or to detail in each and every case the absence of observed

²⁷ See Letter from John P. Janka and Jarrett S. Taubman, Counsel for ViaSat, to John Giusti, Chief, International, Bureau, at 4-5 (dated February 9, 2009).

²⁸ Letter from David S. Keir, Counsel to Row 44, to Marlene H. Dortch, Secretary, FCC, at 1 (dated February 6, 2009) (submitting February 6, 2009 Flight Test Plan).

²⁹ Indeed, ViaSat itself has noted that actual measurement of antenna pointing during flight is impractical. See Letter from John P. Janka and Jarrett S. Taubman, Counsel for ViaSat, to John Giusti, Chief, International, Bureau, at 5 (dated February 9, 2009),



interference. Such an approach would only have produced hundreds, if not thousands, of pages of redundant data that would simply have affirmed the same finding *ad infinitum*. Had interference been observed on these other flights, these instances would have been faithfully recorded and submitted as part of the Flight Test Report, but because no interference occurred, there was no data to record and supply. As it was the Satellite Operators themselves that were responsible for monitoring the relevant transponders to confirm that no interference was occurring, the FCC can be assured that any failure on Row 44's part to report such instances would have been over-ridden by the operators themselves submitting such data to the Commission.³⁰

Finally, with respect to ViaSat's contention that specific interference findings were required to take into account "simultaneous operations on multiple aircraft" (ViaSat 6/24 Letter at 12), such detailed evaluation is not necessary with respect to a TDMA-based system such as Row 44's.³¹ In a CDMA system such as ViaSat's, which generates cumulative broadband interference to adjacent satellites with every plane added to the network at a given power, it is indeed essential to determine the impact of multiple simultaneous transmissions, where the accumulation of signals could produce significant additive interference on adjacent satellites. In contrast, the Row 44 system's use of a TDMA protocol, by far the dominant accepted multiple-access method for this class of satellites, allows Row 44 to avoid possible cumulative interference because only one signal at a time is being transmitted on a given frequency.

B. ViaSat's Input Concerning the Flight Test Plan Was Unhelpful.

With respect to Row 44's flight testing, it is also noteworthy that while ViaSat now complains that it was afforded "no opportunity to review or comment" on the Flight Test Plan,³² ViaSat's input was solicited even before the Test Plan was formulated with the input of EchoStar, Intelsat and SES Americom. Given ViaSat's self-identified expertise in the area of antenna testing, as well as its prior close examination of Row 44's proposal, it was expected that ViaSat would not require an extended period of time to provide helpful input concerning in-flight antenna testing to confirm the absence of harmful interference to adjacent satellites. Accordingly, on January 28, 2009, Row 44 requested that ViaSat provide within a week any

³⁰ Row 44 notes the absurdity of ViaSat's persistent refrain that the Satellite Operators' participation in this proceeding, and support for Row 44, is "economically motivated." ViaSat 6/24 Letter at 16. Row 44 is but one sub-lessor of transponder capacity. This would not provide significant economic incentive for the Satellite Operators to place other customers at risk if ViaSat's concerns actually had merit.

³¹ Indeed, given the fact that ViaSat previously contended that there was no need to authorize Row 44 to use more than a single plane in conducting its flight test (*see* Letter from John P. Janka and Jarrett S. Taubman, Counsel for ViaSat, to John Giusti, Chief, International, Bureau, at 6 (dated February 9, 2009), it is rather disingenuous for ViaSat now to demand that data specifically quantifying aggregate interference be included in the Flight Test Report, particularly when this data is of no relevance to the interference issue (*see* above).

³² ViaSat 6/24 Letter at 7. *See also* ViaSat 6/26 Ex Parte Notice at 2.



suggestions that it might have concerning the technical parameters and evaluation criteria that might be part of such a flight test plan, *i.e.*, no later than the close of business on February 3, 2009.

ViaSat’s subsequent comments, in the form of a two-page letter from its counsel, were provided to Row 44 on February 4, 2009 (in a letter dated February 3, 2009), and did not address in-flight interference testing at all, but instead suggested that Row 44 repeat ground testing using generally the same procedures it had already employed, but with additional components, the purpose of which appeared to be to increase the cost and complexity of the testing without necessarily providing data that would be of any greater utility or accuracy.³³ Thereafter, ViaSat’s further comments on the Flight Test Plan were limited to demands that the testing not be permitted to proceed, that extensive additional ground testing be conducted before any flight testing, and that any flight operations, if authorized, be limited to a single plane.³⁴ ViaSat now complains that its “input was promptly ignored” (ViaSat 6/24 Letter at 7), but in fact, it was ViaSat that ignored Row 44’s request for meaningful and constructive input concerning its flight testing proposal.

C. Row 44 Timely-Filed a Complete Report Detailing the Results of Ground Testing Conducted Prior to the Filing of Its Application.

When the Satellite Division granted Special Temporary Authority to Row 44 to execute its Flight Test Plan, it also asked that Row 44 submit, both to the FCC and to the Satellite Operators that were signatories to the Flight Test Plan, within 30 days of the issuance of the STA Order, “a detailed report on ground based testing conducted pursuant to Special Temporary Authority” including “test data pertaining to antenna mispointing and a description of test procedures.” *Row 44, Inc.*, 24 FCC Rcd 3042, 3043 (¶ 7(e)) (Sat. Div. 2009). Row 44 submitted this Ground Test Report as required on April 13, 2009.

ViaSat has criticized the Ground Test Report in several respects, asserting for example that it “fails to provide any data that substantiate Row 44’s claims of antenna pointing accuracy in the elevation plane.” ViaSat 6/24 Letter at 8.

The operating envelope precludes the elevation axis from contributing to EIRP levels above the required mask.

³³ See February 6, 2009 Test Plan Letter, Attachment B, Letter from John P. Janka, Counsel to ViaSat, to David S. Keir, Counsel to Row 44, dated February 3, 2009.

³⁴ See Letter from John P. Janka and Jarrett S. Taubman, Counsel for ViaSat, to John Giusti, Chief, International, Bureau, at 5-6 (dated February 9, 2009).

³⁵ See Ground Test Report at 1.



ViaSat also argues that Row 44 has not explained “how the accuracy of its antenna pointing was measured or confirmed while the motion table was moving.” ViaSat 6/24 Letter at 9; ViaSat 6/26 *Ex Parte* Notice at 5. As noted in previous submissions, the three dimensional motion table is capable of recording table position to precisions of 0.01 degrees in all three axes while simultaneously recording ADIRU data and antenna positional data.³⁶ Requests for further details indicate a desire to better discover the proprietary tools and methods used for testing rather than address the results –

ViaSat further maintains that Row 44 has “failed to account for airframe dynamics in the flight environment.” ViaSat 6/24 Letter at 12. As discussed in previous filings, airframe dynamics constitute an extremely small part of the pointing error contribution. All airframe alignment, installation alignment, and static mechanical effects are cancelled at installation and re-verified on ground power-up.³⁷ Furthermore, the tracking subsystem provides for on-going correction of slowly changing effects such as various IRU drift components, cargo loads, and thermal shifts.

D. Row 44 Faithfully Executed the Flight Test Plan it Submitted to the Commission Upon Which its STA Was Premised.

The Row 44 STA Order also required Row 44 to “submit to the Commission a detailed written report on the results of technical testing pursuant to this authorization no later than 90

³⁶ *Id.*

³⁷ *See* Opposition of Row 44, Inc. to Supplement to Petition to Deny of ViaSat, Inc., Technical Annex at 8-9 (filed October 23, 2008).

³⁸ *See* Ground Test Report at 25.



days after the release” of the STA Order. Row 44 submitted the Flight Test Report more than 30 days early, on May 11, 2009.

(1) The Flight Tests Were Conducted Under Conditions Where Any Harmful Interference Could Be Easily Detected.

The Flight Test Report reflected the results of extensive in-flight testing undertaken in cooperation with independent Satellite Operators, SES Americom (Los Angeles NOC) and Echostar (Cheyenne Wyoming NOC) to measure the potential of adjacent satellite interference.³⁹

³⁹ See Flight Test Report at 28-40, 41-45 & 52-54.

⁴⁰ ViaSat’s assertion that “radome induced effects” are not accounted for (ViaSat 6/24 Letter at 13) is incorrect; each of the aircraft has an installed radome that has been present throughout all system testing.

⁴¹ ViaSat 6/24 Letter at 15.



(2) The Flight Tests Were Conducted in a Fair and Impartial Manner.

(3) Manual Muting of Row 44 Transmissions Occurred Only In Limited Circumstances For Legitimate Testing Purposes.

⁴² See Ground Test Report at 44.



(4) The Flight Tests Confirmed the Accuracy of Row 44's Link Budget Projections.

(5) Row 44's Flight Test Results Are Accurately Stated.

Throughout these proceedings, ViaSat has attempted to introduce confusion with respect to antenna aperture alignment with the GSO arc.⁴⁷ This critical element of the operating envelope has been referred to variously as skew, polarization, misorientation, and alignment angle. What has remained clear and consistent throughout in all of Row44's filings is the 25-degree limit of the operating envelope for this parameter.

⁴³ See, e.g., ViaSat 6/24 Letter at 13-14.

⁴⁵ See Row 44 Application, SES-LIC-20080508-00570, Exhibit C (Link Budgets); Row 44 Response to August 25, 2008 FCC Letter, SES-AMD-20080829-01117, Attachment 2; Opposition of Row 44, Inc. to Supplement to Petition to Deny of ViaSat, Inc., Technical Annex at 15-20 (filed October 23, 2008).

⁴⁶ Row 44 Response to August 25, 2008 FCC Letter, SES-AMD-20080829-01117, Attachment 2; Opposition of Row 44, Inc. to Supplement to Petition to Deny of ViaSat, Inc., Technical Annex at 21 (filed October 23, 2008).

⁴⁷ See ViaSat 6/24 Letter at 15.



E. The Amount of Information Row 44 Has Submitted Concerning Its System Matches or Exceeds That Provided By Past Ku-Band AMSS Applicants, Including ViaSat.

Finally, the sufficiency of Row 44’s showings is made plain by prior FCC license grants to other non-ESV MSS applicants, including ViaSat itself, which have not involved the submission of the detailed proprietary information that ViaSat now seeks. As Row 44 has pointed out from the beginning of this proceeding, ViaSat’s own AMSS application provided no more detail concerning its antenna pointing mechanism than did Row 44’s initial application,⁴⁸ and given the additional information now submitted by Row 44 in this proceeding, ultimately contained far less than the record Row 44 has compiled here.

When confronted with this incontrovertible fact in Row 44’s Opposition to its Petition to Deny, ViaSat notably did not contend that it had provided either the same quantity or quality of information that Row 44 had provided even then, but instead attempted to evade the issue. ViaSat argued variously that the manner in which the FCC processed its own application was “irrelevant to the evaluation of Row 44’s Application,” that “Row 44’s Application is subject to different requirements than ViaSat’s,” and that “in any event, ... the low power density of ViaSat’s signal” would allow it to avoid interference even if mispointed by more than two degrees.⁴⁹ None of these arguments has merit.

First, as a prior AMSS Ku-band application granted by the FCC, ViaSat’s 2007 license grant is indisputably of precedential value in the consideration of Row 44’s application.⁵⁰ The FCC has taken action on a handful of applications for provision of MSS in the Ku-band (both AMSS and Land-MSS) and each of these prior grants is precedent with respect to this proceeding.

Second, the rules and policies that applied to ViaSat’s application in 2007 are not different from the rules and policies that apply to Row 44’s application now. Then, as now, there were no specific rules that govern applications to provide AMSS in the Ku-band. Then, as now, AMSS systems were governed by the general terms of ITU-R M.1643,⁵¹ which as ViaSat has

⁴⁸ See ViaSat AMSS Application, SES-LIC-200S1028-0 1494, as amended by SES-AMD-20060314-00440 and SES-AMD-20070309-00325, Revised Technical Annex at 10, 18, 22-23 & 31-32.

⁴⁹ Reply of ViaSat, Inc. at 10-11 (filed August 7, 2008).

⁵⁰ See, e.g., *Melody Music, Inc. v. FCC*, 345 F.2d 730, 733 (D.C. Cir. 1965) (when similarly situated applicants are treated differently, the Commission must “do more than enumerate factual differences, if any, between appellant and the other cases; it must explain the relevance of those differences” under the law).

⁵¹ See Recommendation ITU-R M.1643, “Technical and Operational Requirements for Aircraft Earth Stations of Aeronautical Mobile-Satellite Service including Those Using Fixed-Satellite Service Network Transponders in the Band 14-14.5 GHz (Earth-to-space) (WRC-2003).



noted “does not specify an explicit pointing accuracy requirement.”⁵² Nonetheless, then, as now, the FCC’s consideration of such applications was unavoidably influenced by proposals made in the AMSS rulemaking proceeding and the adoption of its ESV rules. Consistent with these rules and proposals, the Bureau evaluated ViaSat’s application based on the capability for “maintaining pointing accuracy within 0.2 degrees,”⁵³ the same standard with which Row 44 has demonstrated compliance in this proceeding.

Third, ViaSat’s implicit suggestion that a different antenna pointing accuracy standard might apply to it based on the power density characteristics of its operations – thereby presumably justifying the submission of less information concerning ViaSat’s pointing mechanism -- has no basis in fact or regulation, either in the text of ITU Resolution 902 or in Section 25.222 of the FCC’s Rules, both applicable generally to ESV. Neither one of these establishes a sliding scale of compliance based on power density, but each instead requires applicants to meet the same $\pm 0.2^\circ$ pointing accuracy standard, regardless of the other technical parameters proposed.

Accordingly, ViaSat’s claim that acceptance of Row 44’s demonstrations of compliance with FCC requirements in this proceeding would depart from “the standards to which it has held other AMSS applicants” is wholly unfounded. ViaSat 6/24 Letter at 16. Indeed, if the FCC were to require the quantity of information demanded by ViaSat, that action itself would represent a significant and unprecedented departure from the approach taken in evaluating prior AMSS license applications.

3. The Coordination Agreements and Supplemental Statements Signed By All Affected Satellite Operators Are Entitled to Substantial Weight Under Section 25.220 of the Commission’s Rules.

The central assertion of ViaSat’s third recent *ex parte* filing is that Section 25.220 of the FCC’s Rules, which provides generally for processing of non-routine Ku-band earth station applications that have been coordinated with potentially affected Satellite Operators, does not apply to applicants seeking to offer MSS applications in the Ku-band.⁵⁴ This argument is simply incorrect, and finds no support even in the few cases that ViaSat has attempted to rely upon to buttress this argument. To the contrary, the FCC has consistently applied Section 25.220 of the rules in all prior cases involving non-ESV MSS earth station applications since the rule was adopted in 2005.⁵⁵

⁵² Reply of ViaSat, Inc. at 11 (filed August 7, 2008).

⁵³ *ViaSat AMSS License Order* at 19969 (¶ 16).

⁵⁴ See ViaSat 6/30 Letter, *citing* 47 C.F.R. § 25.220.

⁵⁵ While ViaSat refers to the original 2000 Boeing application to provide AMSS as being part of the Commission’s “consistent” approach with respect to Section 25.220, it bears noting that 25.220 was not adopted until 2005, long after Boeing’s application was granted.



For example, in the case of ViaSat's own AMSS application, granted in November 2007, the FCC placed principal reliance on its coordination agreement with adjacent operators in determining to grant it a license.⁵⁶ More recent FCC actions on non-ESV Ku-band MSS applications also make the central role of the coordination rule clear by devoting several paragraphs to the specific "Non-Routine Licensing" provisions of the FCC's Rules.⁵⁷ Moreover, as early as the *ARINC* case in 2005, decided before Section 25.220 became effective, the Bureau made plain that, even in the absence of a specific rule providing for such letters, their submission "weighs significantly in ... favor" of grant.⁵⁸ In this instance, Row 44 has not only filed letters reflecting coordination with all adjacent Satellite Operators, but these letters simply buttress the complete showings made concerning its technical operations. *See* Sections 1 & 2, *supra*.

The application of Section 25.220 to MSS applications in the Ku-band, of course, remains unaltered by recent changes to Part 25 which were intended to streamline the processing of non-routine FSS earth station applications.⁵⁹ This recent rulemaking modified the cross-

⁵⁶ *See ViaSat, Inc.*, 22 FCC Rcd 19964, 19968-69 (¶ 15) (IB & OET 2007). Indeed, there is evidence in the record of that proceeding that ViaSat affirmatively sought to avoid submitting coordination letters under Section 25.220, but ultimately did so in order to secure grant. *See* Letter from Elizabeth R. Park, Counsel to ViaSat, to Marlene H. Dortch, Secretary, FCC, File No. SES-LIC-20051028-01494, at 2 (dated January 23, 2006) ("ViaSat submits that the satellite operator engineering certifications described in Section 25.220(c)(2) are not required"). *Compare* Letter from Elizabeth R. Park, Counsel to ViaSat, to Marlene H. Dortch, Secretary, FCC, File No. SES-LIC-20051028-01494, at 1 (dated April 28, 2006) ("ViaSat hereby submits a coordination letter from its satellite operator to supplement the above-referenced application.").

⁵⁷ *See, e.g., Raysat Antenna Systems, LLC*, 23 FCC Rcd 1985, 1990 (¶ 16) (IB & OET 2008) ("Although Raysat's proposed system is not eligible for routine licensing, it may still be authorized under the provisions of Section 25.220 of the Commission's rules, which govern the licensing of non-routine transmit/receive earth station operations that do not conform to Sections 25.209 and 25.212"); *see also L-3 Communications Titan Corporation*, DA 09-587, *slip. op.* at 6 (¶ 14) (IB & OET 2009) (similar language).

⁵⁸ Significantly, *ARINC* was decided in April 2005, less than a month after Section 25.220 was adopted, but several months before it became effective in June of that year. *See* 70 Fed. Reg. 32256 (June 2, 2005). Moreover, the single coordination letter *ARINC* submitted "provided no evidence of coordination with Telesat Canada, which operates a co-frequency FSS satellite only slightly more than four degrees of orbital longitude from AMC-1," thus requiring the Commission to resolve technical issues raised by existing AMSS licensee Boeing. *ARINC AMSS License Order* at 7559 (¶ 19). In this case, Section 25.220 of the rules clearly applies, and ***all*** affected satellite operators have signed coordination letters concerning Row 44's operations, and have also specifically stated that they do not object to grant of the application. *See* June 18, 2009 Statement of Satellite Operators (filed June 19, 2009).

⁵⁹ *See 2000 Biennial Regulatory Review; Streamlining the Commission's Rules and Regulations for Satellite Applications and Licensing Procedures*, Eighth Report & Order and Order on Reconsideration, 23 FCC Rcd 15099 (2008).



Ms. Marlene Dortch
 July 10, 2009
 Page 19 of 20

reference contained in the rule to refer to the new off-axis EIRP envelope standards established for the FCC in Section 25.218 of the Commission's Rules, but did not otherwise alter the applicability of the non-routine processing approach to applications to conduct non-FSS operations in FSS bands.

4. Conclusion

During the fourteen months that Row 44's application has been pending, it has responded diligently to all FCC requests for additional information or support for its proposal. It has supplemented the record both to clarify data provided in its initial application and to provide detailed explanations of its system's technical operations. Only ViaSat, which has thus far failed to establish itself in the in-flight broadband market for commercial air travel that Row 44 seeks to serve, has raised consistent objections to grant of a final license.

With the submission of Row 44's Flight Test Report and the acknowledgement by EchoStar, Intelsat and SES Americom that they have no objection to grant of the AMSS license Row 44 seeks, there is no reason to defer final action on Row 44's application any longer. Row 44's proposal meets the requirements of FCC Rules, will not cause harmful interference to other services in the band, and can be authorized subject to the terms generally applicable to other AMSS licensees in the Ku-band. Row 44 stands poised to serve passengers on two major U.S. airlines, Alaska Air and Southwest Airlines as soon as the FCC takes action. Accordingly, Row 44 respectfully urges that its application be granted expeditiously, so that it may begin offering its service to the public on a permanent basis.

Respectfully submitted,

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Ms. Marlene Dortch
July 10, 2009
Page 20 of 20

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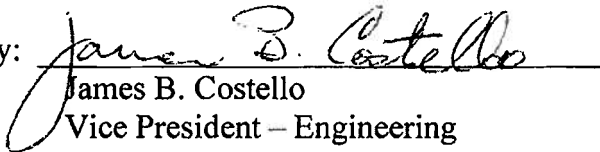
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TECHNICAL CERTIFICATION OF ROW 44, INC.

I, James B. Costello, hereby certify that I am the technically qualified person responsible for reviewing the engineering information contained in the foregoing submission, that I am familiar with Part 25 of the FCC's Rules, that I have either prepared or reviewed the engineering information included in the filing, and that this information is true and correct to the best of my knowledge and belief.

July 10, 2009

By: 
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