

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the matter of	)	
	)	
AvL Technologies	)	File Nos: SES-MOD-20040225-00277
	)	SES-AMD-20040903-01302
Application to Modify Blanket Earth Station	)	Call Sign: E030130
License to Add 50 Each of 0.75, 0.96 and 1.0	)	
meter Ku-Band Antennas	)	

**ORDER AND AUTHORIZATION**

**Adopted: November 5, 2004**

**Released: November 8, 2004**

By the Chief, Satellite Division, International Bureau:

1. In this Order, we grant a request from AvL Technologies (AvL) to modify its blanket earth station license to add 50 each of 0.75, 0.96 and 1.0 meter temporary-fixed earth station antennas, to operate in the Ku-Band.<sup>1</sup> AvL indicates it will use the earth station antennas added by the modification for acceptance tests and demonstrations for its customers.

2. Pursuant to Section 25.209(f) of the Commission's rules,<sup>2</sup> AvL's application is accompanied by agreements to the proposed operation signed by representatives of PanAmSat and Loral, who operate satellites within 6 degrees of AvL's proposed points of communication, AMC-6 at the 72° W.L. orbital location, and AMC-4 at the 101° W.L. orbital location.<sup>3</sup> PanAmSat and Loral's agreements were based on detailed information, provided by SES Americom, as to the technical and operational characteristics of the earth stations.<sup>4</sup> SES Americom further certified that "the maximum downlink satellite EIRP density

<sup>1</sup> In this Order, the term "Ku-Band" refers to the 14 – 14.5 GHz (uplink) and 11.7 – 12.2 GHz (downlink) frequency bands.

<sup>2</sup> 47 C.F.R. § 25.209(f) (providing that antennas that do not meet certain enumerated performance standards may nonetheless be authorized, upon a demonstration that they will not cause unacceptable levels of interference under conditions of two degree spacing between satellites).

<sup>3</sup> Attachments Affidavit 1 and Affidavit 2. Those agreements were secured on January 13, 2004, for PanAmSat, and on December 9, 2003, for Loral.

<sup>4</sup> This included a description of each terminal's dimensions, and a statement that "the antenna will tilt in order to maintain the long axis tangent to the orbital arc with the correct polarization, when the longitudinal difference between the intended satellite and the earth station location is greater than zero degree[s]. The feed assembly for each antenna is mounted on an AvL Technologies Roto-Lok drive system." The description also indicated the region off-axis from maximum gain at which the earth station antennas do not meet the performance standards of the Commission's rules, due to the width of its main lobe, as well as an indication that each antenna was compliant with the side lobe pattern requirements specified in Section 25.209 of the Commission's Rules in the plane of the geostationary satellite orbit as it appears at the particular earth station location for off-axis angles starting at 2.1 degrees in the transmit band. The description indicated that "the antennas are to be aligned with a nominal pointing accuracy of less than or equal to 0.3 degrees with wind" (for the 0.75 and 0.96 meter antennas) and "less than or equal to .4 degrees" (for the 1.0 meter antenna) and "will operate at a maximum input power density at the antenna waveguide flange that complies with the -14.0 dBW/4 kHz FCC maximum [input power density] for 2-degree compliant systems and routine licensing" (-15.0 dBW/4 kHz for the 0.75 meter antennas, and -15.4 dBW/4kHz for the 0.96 and 1.0 meter antennas)." Certification dated December 9, 2003 from Jaimie Londono, Satellite Marketing

of 7.0 dBW/4KHz, the operational level of the Ku-band network operated by AvL, is within the levels coordinated with Loral;" that "the antennas will be installed by a professional installer and aligned with the intended satellite to less than or equal to the tolerance as stated in [the agreement] letter;" that "the antennas 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 AvL antennas;" and that the operation "will accept interference from adjacent satellites to the degree to which harmful interference would not be expected to be caused to an earth station conforming to the reference patterns defined in § 25.209 [(a) and (b)] of the FCC rules." SES Americom also certified that should other satellites be positioned at 72° or 101° W.L. orbital locations, the transponder assignments coordinated with PanAmSat and Loral will remain the same.

3. The application was placed on public notice on April 7, 2004.<sup>5</sup> On May 7, 2004, SWE-DISH Satellite filed a petition to deny AvL's application. On May 20, 2004, AvL filed an opposition, and on May 27, 2004 SWE-DISH filed a reply to that opposition. On September 9, 2004, AvL filed a minor amendment to make clear that they did not represent a foreign government, and to make fractional degree reductions in power levels to reconcile the application on file with the data in agreements with PanAmSat and Loral.<sup>6</sup>

4. SWE-DISH, in its petition to deny, identifies what it views as missing information concerning antenna pointing error, radiation hazard, capability to transmit in both polarizations and other matters. SWE-DISH asks that the Commission require submission of and carefully review that information before taking any further action. On October 15, 2004, in response to AvL's amendment, SWE-DISH filed comments that repeated some of the material in earlier filings. On October 22, 2004, AvL filed a reply to SWE-DISH's October 15, 2004 comments. In that reply AvL stated that, although AvL did not agree with SWE-DISH's arguments, AvL chose not to respond so that the Commission might proceed in this matter.

5. The Commission's Rules, Part 25.209(f), provide for authorization of operation of an earth station with an antenna not conforming to the gain pattern templates of 25.209(a) and (b) upon a finding by the Commission that unacceptable levels of interference will not be caused under conditions of uniform 2° orbital spacing.<sup>7</sup> The Commission has authorized non-conforming earth station operations if

---

(...continued from previous page)

Director, SES Americom, accepted by Krish Jonnalagadda, Technical Projects Director, Loral Skynet, addressed to Federal Communications Commission – International Bureau, and Certification dated January 13, 2004 from Jaimie Londono, Satellite Marketing Director, SES Americom, accepted by Mohammad Marashi, Vice President, Customer Support Engineering, PanAmSat Corporation, addressed to Federal Communications Commission – International Bureau.

<sup>5</sup> Report No. SES-00593.

<sup>6</sup> On August 19, 2004, the Commission directed AvL to reconcile fractional dB differences in the levels in input power densities derived from the antenna gain and eirp density entered, and the corresponding levels in its agreements with operators of adjacent satellites, and to amend the application to correct an entry of "Not Applicable" in response to the question regarding representation of a foreign government. Letter dated August 19, 2004 from William Howden, Chief, Systems Analysis Branch, Satellite Division, International Bureau, to William Coulter, counsel for AvL. On September 3, 2004, AvL effected both the reconciliation and the correction via amendment.

<sup>7</sup> Section 25.209 (f) provides:

"An earth station with an antenna not conforming to the standards of paragraphs (a) and (b) above will be routinely authorized after February 15, 1985 upon a finding by the Commission that unacceptable levels of interference will not be caused under conditions of uniform 2° orbital spacings. An earth station antenna initially authorized on or before February 15, 1985 will be authorized by the Commission to continue to operate as long as such operations are found not to cause any unacceptable levels of adjacent satellite interference. In either case,

operators of satellites within six degrees of the proposed points of communication certify that they agree to the proposed operation. AvL has established to our satisfaction that Loral and PanAmSat, the operators of satellites within six degrees of the proposed points of communication, certify their understanding of and agreement to the proposed operation. No operators of adjacent satellites have objected to the proposed operation.<sup>8</sup> We find that the acceptance by Loral and PanAmSat of the operation proposed by AvL satisfies any concerns we might have with regard to potential interference resulting to adjacent satellite operations from earth station antenna misalignment and pointing error.

6. SWE-DISH observes that:

The potential for radiation hazard to the earth station operator as a result of backlobe radiation is another risk associated with reductions in antenna size. . . . The incomplete information reflected in the antenna patterns on the AvL antenna backlobe transmissions suggests that AvL has ‘opted for’ a large backlobe in order to minimize the width of the mainlobe. These backlobe radiations may raise a safety issue for the earth station operator, particularly in the ‘fixed temporary’ mode in which these systems are intended to operate. However, the terse Radiation Hazard Studies submitted by AvL fail to address this issue sufficiently for SWE-DISH to determine whether their systems comply with Commission requirements. Until such information is submitted for these earth stations, SWE-DISH believes grant of the Application would be premature.<sup>9</sup>

AvL’s analyses<sup>10</sup> show flux densities in the on-axis near field region of 1.88 mW/cm<sup>2</sup> for the 0.75 meter antenna; 4.08 mW/cm<sup>2</sup> for the 0.96 meter antenna; and 5.81 mW/cm<sup>2</sup> for the 1.0 meter antenna. These values exceed the flux density component of the Commission’s criteria for evaluation of the environmental impact of human exposure to radio frequency (RF) radiation.<sup>11</sup> The areas of possible excess radiation exposure include the region directly in front of the main reflectors, for some distance along the main beam of the antenna in the direction of the satellite, as well as behind and around the main reflector. The region of greatest possible exposure would be in the vicinity of the feed and the sub-reflector and in the spill-over region of the sub-reflector. We will require that the operator of the earth stations assure that no individuals will be exposed to radiation levels beyond the maximum permissible exposure limits. In order to facilitate this requirement, the licensee must place a label or labels permanently on the earth station, warning about the radiation hazard and including a diagram showing the regions around the earth station where the levels could exceed 1.0 mW/cm<sup>2</sup>. It shall be the responsibility of the earth station operator to keep individuals from straying within this hazardous region by means of signs, caution tape, verbal warnings, placement of the earth station so as to minimize access to the hazardous region, or any other appropriate means.

7. Accordingly, IT IS ORDERED that, AvL Technologies’ application for modification of license, File No. SES-MOD-20040225-00277, as amended by File No. SES-AMD-20040903-01302, IS GRANTED, and AvL’s blanket earth station license, call sign E030130, IS MODIFIED to include authority to operate fifty 0.75 meter antenna, fifty 0.96 meter antenna, and fifty 1.0 meter antenna earth

---

(...continued from previous page)

the Commission will impose appropriate terms and conditions in its authorization of such facilities and operations.”

<sup>8</sup> Public Notice, Report No. SES-00607.

<sup>9</sup> SWE-DISH Petition to Deny at 3, 7 (footnote omitted).

<sup>10</sup> The radiation hazard analyses initially provided by AvL contained typographical errors, and were replaced in attachments to AvL’s Opposition to SWE DISH’s petition to deny.

<sup>11</sup> 47 C.F.R. § 1.1310; *see also* OET Bulletin 65.

stations accessing the AMC-6 satellite at the 72° W.L. orbital location and the AMC-4 satellite at the 101° W.L. orbital location, consistent with the technical specifications set forth in its application, and subject to the following conditions:

- a. AvL shall take all reasonable and customary measures to ensure that the earth stations do not create a potential for harmful non-ionizing radiation to persons who may be in the vicinity of the earth stations when they are in operation. At a minimum, permanent warning labels shall be affixed to the earth stations, warning of the radiation hazard and including a diagram showing the regions around the earth stations where the radiation levels could exceed 1.0 mW/cm<sup>2</sup>. The operator of the earth station shall be responsible for assuring that individuals do not stray into the regions around the earth stations where there is a potential for exceeding the maximum permissible exposure limits required by Section 1.1310 of our Rules, 47 C.F.R. §1.1310. This shall be accomplished by means of signs, caution tape, verbal warnings, placement of the earth station so as to minimize access to the hazardous region and/or any other appropriate means.
- b. This authorization is limited to communications with SES satellites AMC-4 at 101.0 degrees W.L. nominal orbital location and AMC-6 at 72.0 degrees W.L. nominal orbital location, in the 14.0-14.5 GHz (uplink) and 11.7-12.2 GHz (downlink) bands.
- c. AvL will maintain nominal pointing accuracy of less than or equal to 0.3 degrees with wind (for the 0.75 and 0.96 meter antenna earth stations) and less than or equal to 0.4 degrees (for the 1.0 meter antenna earth stations) as described in the agreements with Loral Skynet and with PanAmSat Corporation.
- d. During operation of the earth stations, AvL will maintain alignment of the major axis of each earth station antenna with the tangent to the geostationary satellite orbital arc at the point of the target satellite, with the correct polarization.
- e. In the event of a report of harmful interference resulting from the use of these earth stations, AvL will immediately cease operations and inform the Commission.
- f. Whenever an earth station is in use, a trained and competent operator must be physically present.

- g. The antennas must be installed by a professional installer and aligned with the intended satellites to less than or equal to the tolerance stated in the agreements with Loral Skynet and with PanAmSat Corporation.
- h. AvL will operate the earth stations in accord with all conditions specified in the agreements with Loral Skynet and with PanAmSat Corporation.

8. IT IS FURTHER ORDERED that this Order is issued pursuant to Section 0.261 of the Commission's rules on delegations of authority, 47 C.F.R. § 0.261. This Order SHALL BE EFFECTIVE upon release. Petitions for reconsideration under Section 1.106 or applications for review under Section 1.115 of the Commission's rules, 47 C.F.R. §§ 1.106 and 1.115, may be filed within 30 days of the date of the release of this Order.

FEDERAL COMMUNICATIONS COMMISSION

Thomas S. Tycz  
Chief  
Satellite Division  
International Bureau