



January 11, 2012

FILED ELECTRONICALLY VIA IBFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, NW
Washington, DC 20554

Re: Application for Authority to Provide Aeronautical Mobile-Satellite (Route) Service Over the IRIDIUM System, File Nos. SAT-MOD-19961204-00139, SAT-AMD-20050816-00160 and SAT-AMD-20051118-00236

Dear Ms. Dortch,

This letter provides comments by Inmarsat, Inc in response to the December 16, 2011 Public Notice on the Application for Authority to Provide Aeronautical Mobile-Satellite (Route) Service (AMS(R)S) over the IRIDIUM System, File Nos. SAT-MOD-19961204-00139, SAT-AMD-20050816-00160 and SAT-AMD-20051118-00236. Inmarsat is cognizant of footnote 5.367 of the ITU Radio Regulations which provides a primary allocation to AMS(R)S in the band 1610 – 1626.5 MHz, which is in addition to the primary allocation of this band to the Mobile-Satellite Service (MSS) (Earth – space) and the Aeronautical Radionavigation Service (ARNS). Therefore, from a spectrum management perspective, Inmarsat does not object to the proposal. As the world's largest supplier of AMS(R)S, Inmarsat acknowledges the national and international documentation of Iridium AMS(R)S as detailed in Iridium's letter of December 13, 2011.

Iridium's letter does not, however, provide detail on the fact that the national and international aviation community has imposed or identified significant restrictions on the use of Iridium for AMS(R)S, and we urge the Commission to consider including these restrictions as conditions in any action taken so that users of Iridium and services in adjacent spectrum are aware of these constraints. Inclusion of these conditions in any final authorization is clearly in the public interest, as it makes the operating rules transparent to all and, therefore, provides a common framework for continued innovation and development of new services, resulting in greater spectrum efficiency of the Big LEO and geosynchronous MSS (including Aeronautical Mobile Satellite Service (AMSS) and AMS(R)S) bands.

In particular, Inmarsat requests that any Commission final authorization for Iridium's AMS(R)S includes recognition of the following constraints:

1) Approval for IRIDIUM AMS(R)S is limited to Oceanic and Polar airspace.

a) ICAO has only analyzed the ability of Iridium AMS(R)S to operate in the existing interference environment in Oceanic and Polar airspace. Iridium's letter of December 13, 2011 indicates that "the FAA announced that it would authorize aircraft for the Future Air Navigation System (FANS) (including AMS(R)S) operation in U.S. Oceanic airspace using Iridium." This limitation is in keeping with the recommendations of the ICAO Aeronautical Communications Panel, Working Group M, in June, 2008¹, which accepted an analysis of Iridium AMS(R)S to operate in the existing interference environment in Oceanic airspace, and noted:

The analysis presented to the group (and the methodology used) is not applicable to other operational scenarios where the probability of impact of Inmarsat interference may be greater due to the potential for increased number and density of terminals. These scenarios include other aeronautical airspaces (continental en-route, approach, terminal, and airport surface operations) and non-aeronautical terminals and non-aeronautical services.

To date, there has been no peer- or community-reviewed analysis of the ability of Iridium AMS(R)S to operate in the interference environment existing in other operational scenarios. Therefore, Iridium AMS(R)S should be restricted to Oceanic and Polar airspace.

b) The FAA has only tested and analyzed Iridium AMS(R)S performance in Oceanic airspace. Iridium's letter of December 13, 2011 also indicates that "the FAA announced that it would authorize² aircraft for FANS (including AMS(R)S) operation in U.S. Oceanic airspace using Iridium." In fact, the entire test regime referenced by Iridium's December 13, 2011 letter was focused on Oceanic airspace, and, in particular, on the FANS 1/A applications in Oceanic airspace. Therefore, to the extent that the FAA completed and accepted operational testing of Iridium AMS(R)S, it is only in Oceanic airspace.

c) The Oceanic restriction is not a new limitation for users. Although important information for potential users of AMS(R)S, such a restriction is not a significant burden, as AMS(R)S of any type (Iridium or non-Iridium) is not routinely used in United States continental airspace, due to the presence of an extensive line-of-sight communications network operating in the VHF band.

¹ "AERONAUTICAL COMMUNICATIONS PANEL (ACP) WORKING GROUP M (Reconstituted) REPORT OF THE TWELTH (sic) MEETING," International Civil Aviation Organization (ICAO), Montreal, June 16-19, 2008.

² Inmarsat submits that it would be appropriate to clarify some terminology used within the Iridium filing. In several places, the filing states that the FAA "authorizes" Iridium for AMS(R)S use in U.S. Oceanic airspace. Technically, the FAA removed restrictions for the use of FANS1/A using Iridium in U.S. Oceanic airspace and indicated it would undertake a review of any literature that inferred that AMS(R)S applies only to Inmarsat Classic Aero. This does not mean the FAA has any say in the "authorization of Iridium for AMS(R)S."

2) Approval of Iridium AMS(R)S should not be interpreted as authorizing Iridium to request changes in AMSS or AMS(R)S operating in adjacent bands, where such services are operating in compliance with existing national and international standards already in effect.

It is well known that the Iridium system design chose to put the space-to-Earth link in spectrum adjacent to spectrum formerly used by MSS only in the Earth-to-space direction. It is also well known that this spectrum (1616-1626.5 MHz) is allocated by the ITU on a primary basis for MSS (Earth-to-space) and for AMS(R)S, but on a secondary basis for MSS (space-to-Earth). As already noted, ICAO has accepted analyses indicating that operation of Iridium AMS(R)S will not experience harmful interference in Oceanic airspace, when other aircraft are performing AMSS and/or AMS(R)S operations in the adjacent 1626.6-1660.6 MHz band with equipment that meets current national and international standards. Such equipment is operated on thousands of business, commercial and government aircraft, representing installed investments of hundreds of millions of dollars. It is clearly not practical and not in the public interest to force extensive and expensive modification of such equipment merely to permit a new service, which chooses to use a band traditionally used for mobile-to-space communications for both mobile-to-space and space-to-mobile communications. Therefore, the Commission should clarify that Iridium should be restricted from requesting such changes solely to support its new AMS(R)S service.

As noted earlier, ICAO ACP WG-M has determined that this restriction should not adversely affect Iridium AMS(R)S in Oceanic airspace.

3) Any approval of Iridium AMS(R)S should contain cautionary language regarding constraints on the simultaneous, independent operation of Iridium and Inmarsat services on the same aircraft.

This constraint applies in the situation where both Iridium and Inmarsat Aeronautical Earth Stations (AES) (i.e., satellite transceivers) are installed on the same aircraft. Such a constraint is specifically noted in multiple sections of the Iridium Satellite Normative Appendix to RTCA DO-262A.³ In particular, Section 1.1.4 informs potential Iridium users of this issue in the following clear language:

1.1.4 Simultaneous Operation of Iridium and Inmarsat Aeronautical Services

The minimum performance standards contained in this document are intended to assure proper operation of Iridium AMS(R)S on all aircraft. This section, however, addresses operational scenarios occurring beyond that of minimum performance standards, including aircraft that desire simultaneous independent operation of both Iridium and Inmarsat AES terminals without a demonstrated means of cooperation. Owners, operators and installers are cautioned that simultaneous independent operation of Iridium and Inmarsat AES equipment on the same aircraft has the potential to cause significant interference to all Iridium AMSS and AMS(R)S services. This caution applies to Inmarsat equipment that is compliant with RTCA DO-210D, including all changes, AEEC Characteristic 741, AEEC Characteristic 761, and AEEC Characteristic 781. At the time of publication of this document, simultaneous independent operation of Iridium and Inmarsat equipment on the same aircraft had been reported in special cases. However, no generally applicable and technically feasible means of mitigating the potential for interference could be identified.

³ "Minimum Operational Performance Standards for Avionics Supporting Next Generation Satellite Systems (NGSS)," RTCA, Inc., Washington, DC, DO-262A, Dec. 16, 2008

This caveat specifically excludes installations where Iridium and Inmarsat are intended for use in separate airspace. For example, no special installation or other considerations are required for Iridium use in polar airspace that is outside of the Inmarsat coverage volume.

Multiple additional sections of the Iridium Normative Appendix require technical standards to be satisfied if such simultaneous independent operation on the same aircraft is desired.

The Iridium Normative Appendix was prepared by Iridium, developed and approved by RTCA Special Committee 215, and adopted and published by the RTCA Program Management Committee. As noted in Iridium's December 13 letter, this appendix forms the basis of the TSO-159a of June 2010. Therefore, this constraint is well-known, well-reviewed, and completely understood by the user community. There should be no issue with the Commission incorporating cautionary language regarding such a well-understood constraint in any order.

From a public benefit standpoint, Inmarsat believes that any interference issues between Inmarsat and Iridium AES operating on the same aircraft should be left up to the marketplace for resolution. At the current time, there are no known technologies that would permit simultaneous such operation without a) compromising use of the existing AMSS and AMS(R)S currently offered in the 1626.6-1660.6 MHz band, or, b) compromising use of Iridium AMSS and AMS(R)S in the 1616-1626.5 MHz band, or c) compromising service in both bands. To the extent that Iridium AMS(R)S might represent a sufficiently robust business value proposition, it should be permissible – *but not required* – for an individual user to choose to install both systems and to determine how to manage any on-aircraft interference issues in a matter that is most beneficial for the individual user's purposes.

Because this is a long-standing technical hurdle well-known in the Iridium and Inmarsat community, and because there is no FAA mandate that individual aircraft carry and operate *both* AMS(R)S systems, this is clearly a market/user issue. Nothing in the Commission authorization should require either system to compromise its performance when operating in accordance with current national and international standards merely to permit installation and independent simultaneous operation of the other system on the same aircraft.

With these reasonable and well-known operating conditions in place, the AMS(R)S marketplace is sufficiently large to permit both systems to coexist, as well as systems currently within the regulatory approval pipeline, thereby promoting the public interest by providing increased safety and regularity of flight along national and international air routes. Inmarsat urges that the Commission recognize, consider and adopt such language as an integral part of any authorization in response to Iridium's request.

Respectfully Submitted,

/s/

Diane Cornell
Vice President, Government Affairs
Inmarsat, Inc.

cc: Mindel De La Torre
Gardner Foster
Robert Nelson
Howard Griboff
Sankar Persaud
Stephen Duall