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Federal Communications Commission
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Before the
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
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Mobile Satellite Ventures Subsidiary LLC	)	
	)	
Application for Modification of Space Station License (AMSC-1)	)	File No. SAT-MOD-20031118-00333
	)	
Amendment to Pending Application to Launch and Operate a Next-Generation Replacement MSS Satellite System	)	File No. SAT-AMD-20031118-00332
	)	
Application for a Modification of Blanket License to Operate Mobile Earth Terminals with MSAT-1	)	File No. SES-MOD-20031118-01879

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Policy Branch
International Bureau

APPLICATION FOR REVIEW

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APPLICATION FOR REVIEW

Inmarsat Ventures Limited ("Inmarsat") hereby files this Application for Review of the *MSV Order*,[1] in which the International Bureau granted in part the applications of Mobile Satellite Ventures Subsidiary LLC ("MSV") (collectively, the "*ATC Application*") to operate an Ancillary Terrestrial Component ("ATC") to its licensed Mobile Satellite Service ("MSS").

I. INTRODUCTION AND SUMMARY

Full Commission review is warranted of the International Bureau's ATC licensing decision because the Bureau has effectuated fundamental changes in the Commission's policy framework for licensing ATC. Moreover, in granting the first license under the *ATC Order*,[2] the Bureau has addressed new and novel arguments not previously considered by the Commission,

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1 *In re Applications of Mobile Satellite Ventures Subsidiary LLC,* DA 04-3553 (rel. Nov. 8, 2004) (the "*MSV Order*").

2 *See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands*, 18 FCC Rcd 1962 (2003), *Errata*, IB Docket Nos. 01-185 and 02-364 (rel. March 7, 2003), *on reconsideration*, FCC 03-162 (rel. July 3, 2003) (the "*ATC Order*").

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and therefore has exceeded its delegated authority.[3]

More specifically, the Bureau's decision effectively reverses the Commission's established ATC policies for the L-Band in a number of key respects:

- The Bureau elevates terrestrial service from secondary to primary status, effectively rendering MSS service "ancillary" to terrestrial operations;
- The Bureau permits ATC base stations to be deployed at six times the power permitted in the *ATC Order*, rather that following the Commission's policy to phase in ATC in the L-Band to minimize the risk to safety and other services; and
- The Bureau's action freezes MSS satellite services and coverage in time, rather than allowing the continued expansion of MSS service across the U.S., in urban, suburban and rural areas alike.

In its *ATC Order*, the Commission provided MSS operators a measure of flexibility to enhance their satellite-based services with terrestrial transmitters. In doing so, the Commission authorized ATC, subject to important limitations designed to protect the continued provision of MSS service in the L-Band, which is already heavily used for MSS service:

- The interfering power generated by ATC mobile terminals and ATC base stations must be constrained to specified levels;
- Advanced ATC antenna technology must be deployed to focus interfering power away from the MSS victim;
- Any variations from the FCC's "baseline" ATC system parameters are permitted only if those variations produce "no greater interference potential"; and
- ATC deployment must be phased in over 18 months at reduced levels to minimize the chance of harm to safety-related and other services, and to allow Inmarsat the chance to study the real-world consequences of ATC deployment.[4]

The Commission recognized that the deployment of ATC was an experiment, and that the technical parameters it imposed on ATC operations might not achieve the goal of protecting MSS systems from ATC interference. It therefore made crystal clear that ATC operations were authorized on a secondary, non-harmful interference basis, even in those

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[3] 47 CFR § 0.261(b)(1)(ii).

[4] *ATC Order* at 2036-2038 and n. 394.

instances in which ATC operations otherwise comply with Commission Rules:

> [I]n the unlikely event that an adjacent MSS or other operator does receive harmful interference from ATC operations, either from ATC base stations or mobile terminals, the ATC operator must resolve such interference.[5]

Inmarsat is not opposed to the concept of ATC. The problem is that no one – neither MSV, the Commission, nor Inmarsat – knows precisely how ATC will impact the Inmarsat system. ATC *will* generate interference into MSS, and Inmarsat has not seen anything that resolves its very serious concerns about the level of that interference or the impact that Inmarsat users would suffer due to ATC. It is not possible to know the full impact of ATC because (a) MSV's ATC system is still under development, (b) no L-Band ATC system has yet been deployed, and (c) the "real world" impact of ATC has yet to be studied. For these reasons, the Commission's ATC "phase in" policy, and its authorization of ATC as a secondary service, were and remain not only appropriate, but *necessary* to preserve (i) the integrity of the safety services provided over the Inmarsat system, and (ii) the settled expectations of Inmarsat and its users, whom Inmarsat estimates have collectively invested well over $5 billion in MSS technology based on longstanding international spectrum allocations and Commission policies regarding MSS. The integrity and future of MSS service must not be compromised in order to accommodate ATC.

With a few strokes of a pen, however, the Bureau's ATC licensing order has undermined key Commission policies and eviscerated the carefully constructed framework that was designed (i) to ensure that the secondary ATC service did not "morph" MSS into "ASC" –

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[5] *Id.* at 2017. "Stations of a secondary service: (i) Shall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date." 47 CFR § 2.105(c)(2). The Commission authorized ATC on a non-harmful interference basis to ensure consistency with applicable ITU regulations, because such terrestrial uses of the L-Band were not provided for in the International Table of Frequency Allocations. *ATC Order* at 2066.

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an "ancillary satellite component" to terrestrial wireless services,[6] and (ii) to protect Inmarsat and its users from interference.[7] In the expediency of issuing the very first ATC license, and in order to save MSV the cost of complying with the ATC rules, these fundamental principles have been cast to the wind, the ground rules have been changed, and the Bureau has ignored relevant evidence, all to the detriment of Inmarsat and its users:

- The Bureau has significantly increased the area around an ATC base station where an MSS mobile terminal will not work, by permitting a substantial increase in base station power level, and simultaneously allowing use of a non-compliant ATC base station antenna;
- The Bureau has required Inmarsat, in advance, to demonstrate that it will provide service in the vicinity of such a higher-power ATC base station in order to preserve the right to provide MSS service there;
- The Bureau failed to require MSV to comply with the constraint that ATC mobile terminals limit their power when operating outdoors;
- The Bureau ignored evidence about the susceptibility of Inmarsat receivers to ATC interference, and did not address the cumulative effect of the waivers it granted; and
- The Bureau acknowledged that MSV's base stations will generate interference into nearby Inmarsat mobile terminals, but "punted" resolution of that issue to negotiations between MSV and Inmarsat.

This decision warrants review and reversal by the Commission because it shifts the burden to the primary service – MSS – to demonstrate that it will serve the area surrounding a high-powered ATC base station, it has the net effect of increasing ATC interference into Inmarsat's MSS services, and it punches "swiss cheese" holes throughout Inmarsat's service area. It cuts up Inmarsat's service area by creating large "exclusion zones" around ATC base stations where Inmarsat terminals will not work, and where Inmarsat users may not be able to retain interference protection. Thus, this decision threatens the reliability of existing Inmarsat services, and also constrains the future development of broadband MSS service in the U.S.

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[6] *ATC Order* at 2000.

[7] *Id.* at 2036.

The Bureau's decision threatens the continued reliability of Inmarsat services, which are essential to the safety and security-related communications of many federal, state and local governmental agencies. Inmarsat MSS terminals were relied on in New York City following the September 11 attacks, and the Fire Department of New York has recently chosen Inmarsat terminals to support its emergency response communications. Inmarsat MSS service is essential for these purposes because the system is independent of the terrestrial and cellular communications networks that may be unavailable or overwhelmed in an emergency. MSS communications simply cannot be at risk of ATC interference in the time of an emergency, when police, firefighters and other rescue personnel need reliable communications the most.

The decision also constrains the ability of MSS to provide broadband service across America, in urban, suburban, and rural areas alike, a capability that is just starting to be realized. In 2005, Inmarsat will deploy its next-generation, state-of-the-art, Inmarsat-4 spacecraft, which will provide ubiquitous 432 kbps broadband service through smaller, less expensive and easier to use user terminals than ever before. This service will be competitive with third generation terrestrial wireless networks (3G) in terms of both price and service quality. This new class of highly-reliable, "anytime, anywhere" broadband service therefore will revolutionize the MSS industry. But this service cannot reach its full potential if there are zones around ATC base stations where these terminals will not work, or in which these terminals are not protected from ATC interference.

Thus, the policy issues raised by this proceeding do not really revolve around providing regulatory flexibility that will enhance MSS service in the L-Band. To the contrary, MSV's efforts in this proceeding and the ATC rulemaking, if successful, would establish ATC parameters that are more in line with a nationwide cellular or PCS buildout, than filling in "gaps" in satellite service. MSV is currently operating a "wounded" spacecraft, and its replacement satellite is at least three years away from being launched, if ever.[8] MSV has retreated from its many promises to greatly constrain the extent of its ATC deployment, and therefore constrain the level of ATC interference into Inmarsat.[9] And MSV has reneged on its proffer to the Commission to use the sophisticated ATC antenna technology on which the agency relied in establishing the ATC rules.[10]

This proceeding is really about two questions: (i) whether the Commission should constrain the ability of all Americans to have access to broadband MSS service, wherever they may be located, in order to support MSV's efforts to bypass the rules adopted in the ATC proceeding, and (ii) whether MSV should be allowed to change the nature of its business and make satellite service the "ancillary" component in the L-Band.

The answer to both is a resounding "No." Such a result would turn on its head the original policies underpinning the Commission's decision to authorize an ancillary terrestrial component to MSS in order to enhance the provision of MSS service. Absent Commission reversal of the Bureau's decision, it is MSS that very well could become ancillary to terrestrial service in the L-Band within the United States.

II. BACKGROUND

Inmarsat's ability to serve the United States historically was constrained to limited maritime and aeronautical services. The Commission's October 2001 market access

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[8] Jason Bates, *MSV Moving Ahead with Second-Generation System Plans*, SPACE NEWS, Nov. 22, 2004 at 6.

[9] For example, MSV repeatedly represented to the Commission that its ATC offering would (i) reuse ATC channels a maximum of 2000 times CONUS-wide, (ii) support a maximum of 90,000 carriers simultaneously transmitting mobile terminals, and (iii) contribute no more than 1% $\Delta T/T$ interference level into Inmarsat's satellites. *Opposition of Inmarsat Ventures Ltd* at 8 (filed Mar. 25, 2004).

[10] *See, e.g., ATC Order* at 2183-2185 (Appendix C2 §§ 2.2.3.1 and 2.2.3.2). MSV represented that it could produce such an antenna in a cost effective manner. *See, e.g., Reply Comments of Motient Services, Inc., et al.*, IB Docket No. 01-185 at 15-16 (November 13, 2001). Immediately after the ATC service rules were promulgated, MSV complained that such an antenna would be difficult to produce and expensive. *ATC Application* at 23 and n. 35.

order first allowed Inmarsat to provide a full range of services to the U.S. over its existing spacecraft.[11] However, authority to use next-generation spacecraft – the Inmarsat-4 series – to provide land mobile services in the United States had to wait until Inmarsat satisfied the requirements of the ORBIT Act, which Inmarsat recently just certified that it has done.[12]

Inmarsat's next generation Inmarsat-4 system, launched in 2005, will revolutionize the MSS industry. This system, fully funded at a cost of over $1.2 Billion so far, was more than five years in the making, and the spacecraft and mobile terminals are now in final testing. Inmarsat-4 will change the MSS paradigm by extending true broadband service (432 kbps) to users whose needs are unmet by terrestrial networks. These MSS spacecraft are more powerful, and have greater capacity, than ever before. Inmarsat-4 will allow Inmarsat to significantly reduce the price of MSS services, support the full range of Internet Protocol (IP)-based services, and deploy mobile terminals that are smaller, less expensive, and easier to set up and use, than ever before. Thus, the Inmarsat-4 system will create a plethora of new uses for MSS technology, make satellite services accessible to an even wider population, and thereby allow Inmarsat to compete even more vigorously with terrestrial and other providers of data and voice services.

Land mobile MSS presents significant growth opportunities.[13] Specifically, Inmarsat's next-generation land mobile services, called BGAN, offer an entirely new class of high-bandwidth, IP–based solutions. BGAN supports transmission rates that are seven times faster than any service Inmarsat offers in the United States today, and are faster than those

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[11] *In the Matter of Comsat Corporation d/b/a Comsat Mobile Communications, et al.*, 16 FCC Rcd 21661 (2001) (the "*Market Access Order*").

[12] Letter from Inmarsat to Secretary, FCC, *Re: SAT–MSC–20040210–00027, Request for Declaratory Ruling* (filed Nov. 15, 2004).

[13] For the nine-month period ended September 30, 2004, land mobile services accounted for 29.3% of Inmarsat's revenues, and during the year ended December 31, 2003, they increased 31% over the year ended December 31, 2002.

planned for many third generation terrestrial wireless networks (3G). The ability to support these new types of services over small, affordable, and easy to install MSS terminals provides a unique opportunity for BGAN to "fill the holes" in broadband coverage, in urban, suburban, and rural areas. BGAN therefore can be an important component of the broadband solution in America, and thereby can support the Commission's broadband policy goals.[14]

Aeronautical services are another area where Inmarsat-4 spacecraft present the opportunity for new classes of ubiquitous MSS service in the U.S. – to both the cabin and the cockpit. Inmarsat-4 provides the opportunity to augment the congested air traffic control system,[15] as well as offer communications services to the aviation industry – commercial, government and private aircraft of all sizes.

The future of broadband service to aircraft is yet to be written. But it is clear that satellite provides a unique opportunity---in fact, the only opportunity---to provide broadband services to airplanes. The growing use of IP-based communications provides the opportunity to have an "always on" link to airplanes, wherever they are flying, to support air traffic control, weather updates, navigation, and voice and data communications. Inmarsat's Swift Broadband service will bring high-data-rate IP and multicast services to airplanes, using the same Inmarsat antenna that is already widely installed on many commercial and private aircraft. Thus, Swift Broadband is well positioned to very quickly meet the needs of the many users who already

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14 Inmarsat has already launched a regional 144 kbps version of the BGAN service in 99 countries with over 20,000 laptop sized satellite terminals produced already. This service will be extend to CONUS as soon as an Inmarsat-4 satellite with U.S. coverage is launched. The Commission has granted several experimental licenses for the testing of this new BGAN service over Inmarsat-3 at 54° W.L.

15 Today, most air traffic control communications in the United States occur through a terrestrial-based VHF system that is overloaded and out of date. The FAA and Eurocontrol have been assessing various solutions, including satellite-based systems. *Future Communications Study (FCS)*, Brent Phillips and Jim Eck, Federal Aviation Administration, at 5, 10 (Aug. 25, 2004) (*available* at http://acast.grc.nasa.gov/workshop/2004/FAA-Eurocontrol_Future_Comm_Study/01-Phillips.pdf).

enjoy the significant benefits and reliability of Inmarsat's existing aeronautical services.

With Inmarsat having now satisfied the final requirements of the ORBIT Act and two Inmarsat-4 series spacecraft scheduled for launch over the next year, Inmarsat is poised to deploy a new generation of services to smaller mobile terminals, at higher data rates, and with more reliable service, than ever before. The Commission wisely acknowledged in granting U.S. market access, that the presence of Inmarsat in the U.S. market "serve[s] the public interest by increasing competition and providing additional services for U.S. consumers."[16] But this public interest benefit and the Congressional policy articulated in the Orbit Act will not fully be realized unless the Commission reverses the Bureau's ATC license grant, which constrains the ability of Inmarsat to make satellite-based broadband service available to users throughout the U.S., whether they are located in or traveling through urban, suburban or rural areas.

III. DISCUSSION

A. The Bureau Modified Commission Policy on the Secondary Nature of ATC

The Bureau effectively has elevated MSV's ATC service from secondary to co-primary status with MSS by (i) eviscerating the ability of Inmarsat and other satellite users of the L-Band to maintain interference protection in the vicinity of an ATC base station, and (ii) allowing MSV to deploy "high powered" ATC base stations and significantly expand the size of the "exclusion zones" around an ATC base station where an Inmarsat mobile terminal will not work.[17] In doing so, the Bureau has adversely affected the ability of Inmarsat, its distributors, and the approximately 350,000 registered users of the Inmarsat system, to provide and receive MSS service throughout the United States.

In the *MSV Order*, the Bureau acknowledged that by granting MSV a waiver of certain power limits, it was substantially increasing the area around an ATC base station where

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[16] *Market Access Order* at 21668-21669.

[17] *See* Appendix A at 1.2 ("Technical Annex").

an Inmarsat terminal would not work in the face of ATC interference. The Bureau did so on the premise that this was not a material change, because it assumed that Inmarsat terminals are not likely to be operated in the vicinity of an ATC base station. Moreover, the Bureau adopted a mechanism by which once MSV provides Inmarsat with notice, Inmarsat has a limited period of thirty days to object to the deployment of that high-powered base station.

The advance showing requirement regarding the likelihood of service in the vicinity of ATC base stations effectively creates a presumption in favor of ATC service, rather than MSS service, wherever ATC is deployed. Moreover, this requirement is unsustainable because it (i) is based on false premises – that ATC will be deployed only in urban areas and that Inmarsat mobile terminals will not be able to operate near ATC base stations, and (ii) impermissibly elevates ATC to a co-primary status, and is unworkable in any event.

1. *The Policy Change is Based on False Premises*

The Bureau's advance showing requirement is based on two related and false premises, and an unstated conclusion:

- Most ATC base stations will be deployed in "urban" areas, where MSV's satellite signal is weak;
- Inmarsat's satellite positions are lower in elevation than MSV's, such that it is very likely that Inmarsat's satellite signal will be even weaker than MSV's in the vicinity of an ATC base station; and
- Inmarsat does not and will not provide service to urban areas and therefore will not be affected by the deployment of ATC base stations in such areas.[18]

The first premise regarding the deployment of ATC base stations in urban areas is false because, in the *ATC Order*, the Commission expressly determined that "achieving optimal spectrum usage may require an MSS operator to use ATC *even though a particular call might be served by satellite.*"[19] The Commission made this determination in the context of rejecting

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[18] *MSV Order* at ¶ 81.

[19] *ATC Order* at 2015.

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proposals that ATC be allowed only where an MSS licensee was technically incapable of providing satellite service. MSV is not constrained in the location of its ATC base stations, and the Commission has found that there will be cases where ATC base stations are deployed even though satellite service is feasible to that location. Thus, there is no basis for the Bureau's conclusion that most MSV ATC base stations will be deployed in "urban" areas, where MSV's satellite signal is "weak."

The second premise---that Inmarsat's satellite signal is unsuitable for service in the vicinity of an ATC base station---falls by the wayside once one realizes that there is not necessarily any relationship between the areas in which ATC is deployed, and the areas that Inmarsat serves. This premise also does not bear scrutiny because it fails to recognize all of the orbital locations where Inmarsat may operate a spacecraft to serve the United States. The Bureau acknowledges the need to take into account, for purposes of uplink interference analyses, those prospective satellites that would be "line-of-sight" with the MSV service area.[20] But it fails to take the same factors into account when considering the potential for downlink interference into Inmarsat. That failure is arbitrary and capricious.

Inmarsat currently has an Inmarsat-2 spacecraft operating at 98° W.L. and the United Kingdom has recently submitted a Request for Coordination for an Inmarsat-4 spacecraft at 104° W.L., and a further Request for Coordination will shortly be submitted for an Inmarsat-4 spacecraft at 98° W.L as well. Those orbital locations provide virtually the same elevation angles as MSV's orbital location. Moreover, by the Commission's own analysis in the *ATC Order*, there are a number of cities where the elevation angles to Inmarsat's spacecraft at 54° W.L and 142° W.L are as good as, if not better than, the elevation angles toward MSV's

[20] *MSV Order* at ¶ 63.

spacecraft at 101° W.L.[21] Thus, there is no basis for concluding that Inmarsat is unable to provide satellite service in the vicinity of ATC base stations.

More broadly speaking, the underlying assumption that satellite service generally is not possible in urban areas is belied by the facts and by other Commission decisions that recognize the possibility of such service.

The Fire Department of the City of New York (FDNY) has chosen Inmarsat satellite-based emergency response communications for the "dependable transmission of video and voice communications between on-the-scene responders and headquarters locations."[22] This selection follows the successful demonstration of Inmarsat technology for FDNY's field and command center units. Indeed, because they are independent of terrestrial and cellular communications networks, satellite-based communications are particularly advantageous in emergency response situations when traditional technologies may be either unavailable or overwhelmed. In sum, because MSS service is provided in New York City, and relied on by the fire department there, it is irrational for the Bureau to have assumed that MSS service cannot be provided in urban areas because a satellite signal is "weak."[23]

One need only look at the proliferation of DBS or FSS antennas in urban areas to realize that satellite service is possible and expected in urban areas. The level of urban satellite service is so significant that it has prompted Commission action at least twice before:

- The Commission stopped the proposed merger of DIRECTV into Echostar specifically because it was concerned (in part) about anti-competitive effects in urban markets;[24] and

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[21] *ATC Order* at 2148 (Appendix C2 § 1.2.3, table 1.2.3.A).

[22] *See* Appendix B.

[23] Indeed, even MSV once touted the use of its MSS service in New York after September 11. *Comments of Motient Services, Inc., et al.*, IB Docket No. 01-185 at Exhibit C (October 22, 2001).

[24] *In the Matter of Application of EchoStar Communications Corporation*, Hearing Designation Order, 17 FCC Rcd 20559, 20629 (2002).

- The Commission relocated terrestrial PCO operators from urban areas in order to facilitate the deployment of Ka band FSS broadband services there.[25]

Finally, the Bureau's assumption that access to Inmarsat's system by MET users "would presumably be unlikely if there are not streets, residences, office buildings, etc. within that distance," is counterintuitive and counterfactual.[26] Locations away from streets, residences, or office buildings are the precise locations where one would expect a *mobile* unit to be most useful. This is true regardless whether the service provided is satellite or terrestrially based.

2. *The Bureau's Prior Showing Requirement for Retaining Interference Protection around ATC Base Stations Should be Abandoned*

The Bureau's prior showing requirement fundamentally reverses the Commission's original vision of ATC deployment, where an ATC proponent bears the burden of demonstrating non-interference, and ATC remains a secondary service. Moreover, this requirement is not clearly laid out, and even in a best case, is utterly impractical. Finally, it impermissibly constitutes a modification of the licenses held by Inmarsat's distributions. For these reasons, this prior showing requirement should be abandoned. But if it nonetheless is retained, this requirement must be modified.

The prior showing requirement appears in two separate places in the *MSV Order*. It appears in the *MSV Order* at paragraph 81.[27] A slightly different formulation appears in the

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[25] *In the Matter of Redesignation of the 17.7-19.7 GHz Frequency Band, etc.*, 17 FCC Rcd 24248, 24254-24255 (2003).

[26] *MSV Order* at ¶ 81.

[27] "[W]e require MSV to notify Inmarsat, and any other authorized L-Band MSS operator, of any ATC base stations that would operate at peak sector power levels above the peak levels allowed under the current rules. A notified party would then have an opportunity to object within 30 days if: 1) it can prove that its system provides a usable MSS satellite signal within 204 meters of the proposed ATC base station's location, and 2) it can show that there is a reasonable likelihood that METs will attempt to access its MSS network from a location within 204 meters of the base station… However, if it is convincingly shown that a higher-power MSV ATC base station could be a problem, MSV must reduce the base station's aggregate per-sector power to a level consistent with the current rules." *MSV Order* at ¶ 81.

ordering clauses at paragraph 95.[28]

As an initial matter, the burden that must be met is unclear. The text of the *MSV Order* provides for MSV to cease operation if Inmarsat makes a "convincing" showing that the ATC base station "could be a problem." However, the ordering clause appears to reflect a different standard of proof, as it provides for MSV to cease operation at higher base station power levels if the operation would "unduly increase the potential for harmful interference." To the extent that any test is retained, the formulation in the text of the order is the only one consistent with ATC being a secondary service.[29] Moreover, it is not clear what the Commission means by "unduly" increasing the potential for harmful interference. That formulation suggests that some level of harmful interference can be created by ATC, but that is clearly contrary to the policy set forth in the ATC Order.[30]

The prior showing requirement is unworkable. As an initial matter, because the 350,000 registered users on the Inmarsat system use *mobile* terminals, those terminals could be used anywhere in the Inmarsat coverage area at any given time, and because the beams on Inmarsat spacecraft encompass both "urban" and "non-urban" coverage, Inmarsat has no way to tell whether those users go near a proposed ATC base station location.

Moreover, each time MSV forms an "intent" to operate an ATC base station at a higher power level, it can send Inmarsat and others on a wild goose chase across the country,

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[28] "MSV must notify Inmarsat, and any other party with authority from the FCC for provision of L-band MSS in the United States, of the location and power specifications of any ATC base stations that it intends to operate with…aggregate EIRP in any sector above 18.9 dBW toward the physical horizon or above 23.9 dBW in another direction at least 30 days prior to commencing such operations and must cease or desist from operation at such higher power levels if such operation would unduly increase the potential for harmful interference." *Id.* at ¶ 95.

[29] Section 2.105(c)(2)(i) of the Commission's rules provides that a "secondary service" "[s]hall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date."

[30] *ATC Order* at 2017.

imposing extraordinary expense on these parties as they race to take measurements, survey areas, and contact potential users all within 30 days. And then if MSV decides not to deploy the higher powered ATC base station after all, it can simply retract its earlier notification, leaving Inmarsat and others with an enormous expense for trying to protect their MSS service area. Nor does this approach appear to accommodate, after the 30-day objection period has run, inevitable developments such as (i) new Inmarsat services and technology, (ii) new customers with new service coverage requirements, (iii) changes in topography in the vicinity of an ATC base station, or (iv) the modification or razing of buildings in the vicinity of an ATC base station. At a minimum, Inmarsat should not be foreclosed from making such a showing at a later date to allow it to address such future developments.

Thus, the prior showing requirement threatens to limit the full potential of MSS services in the United States because the failure to protect primary MSS service in the vicinity of ATC base stations would poke "swiss cheese" holes throughout Inmarsat's hemispherical service area – thereby balkanizing Inmarsat distributors' nationwide licenses – and thus threatening to constrain the future satellite growth of MSS services.

As with all other MSS service authorizations, the Commission has authorized Inmarsat distributors on a nationwide basis through "blanket licenses," thereby recognizing the ubiquitous nature on MSS service, and the need to allow users to use their mobile terminals wherever they may be. That approach to licensing is consistent with the expectations of MSS subscribers – that they will be able to communicate through their devices when and as they need to do so. MSS users in the L-Band do not expect to find "holes" in the service area, whether created by a problem with the satellite's coverage, or by nearby terrestrial interference. This is certainly the case for the over 100,000 "mini M" land mobile terminals that have been commissioned on the Inmarsat system and are able to be used anywhere in the United States a subscriber needs service.

The morass that would be created by the prior showing requirement is the very reason the full Commission expressly declined in the ATC rulemaking to license ATC on a site-by-site basis: it would create "spectrum and administrative inefficiencies" and require "expensive, time consuming testing and monitoring " of proposed ATC base station locations.[31] Those reasons, which are similar to the reasons the Commission has given for foregoing site-by-site licensing in other contexts,[32] were good enough to obviate the need for the site-by-site licensing of ATC as a secondary service. They surely are even more compelling reasons *not* to adopt such a requirement merely to *enable the primary MSS service to retain interference protection* for existing services or future services.

Requiring Inmarsat and other L-Band users to employ such a site-by-site approach to maintain their authorized service area is not only antithetical to the very reasons the Commission declined to license ATC on a site-by-site basis, but also is inconsistent with the way the Commission licenses most other nationwide services, wireless or terrestrial.[33]

Moreover, having recognized that higher base station emissions can in fact present interference problems to Inmarsat mobile terminals,[34] it would be irresponsible to allow MSV to roll out its higher power service and then embroil the Commission in a series of

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[31] The Commission rejected a proposal that MSS licensees provide evidence they could not serve via satellite a location that they intend to serve via ATC." *ATC Order* at 2015.

[32] *See Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules*, 19 FCC Rcd 14165, 14190 (2004) ("eliminating inefficient, administratively burdensome site-by-site licensing rules, the transaction costs of which are too high to permit competitive businesses to flourish using next generation technology."); *Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands,* 18 FCC Rcd 25152, 25175 (2003) (explaining many advantages of geographic licensing over site-by-site licensing, especially for ubiquitous mobile services).

[33] *See In the Matter of Amendments to Parts 1, 2, 27 and 90 of the Commission's Rules*, 17 FCC Rcd 9980, 9991-92 (2002) ("We believe that nationwide licensing provides licensees flexibility to develop and provide new services ubiquitously across the entire band . . . . [and] serves the public interest by promoting flexibility and efficient spectrum markets.").

[34] *MSV Order* at ¶ 82.

adjudicatory disputes about whether those operations really are a problem. It will be near impossible for the Commission to put the genie back into the proverbial bottle once MSV has deployed base stations and commenced service to the public. Thus, once Inmarsat or any other party objects to the operation of the ATC base station at higher power, MSV should not be allowed to operate at that higher power unless and until the Bureau has resolved the dispute. Otherwise, MSV would be allowed to "unduly increase the potential for harmful interference" and Inmarsat and others would have no short term mechanism to prevent such interference from occurring. Inmarsat users certainly do not expect to forego essential services while the Commission conducts a series of proceedings to resolve interference disputes.

Moreover, because it appears to require Inmarsat's distributors to accept harmful interference unless they object within 30 days, the prior showing requirement constitutes a violation of the prohibition in Section 316 of the Communications Act against modifying a license without notice and a hearing.[35]

B. The Bureau Failed to Enforce a Critical Constraint on ATC Interference into Spacecraft

Inmarsat objected below to MSV's failure to provide a demonstration that (i) MSV's mobile terminals have a 63x power reserve[36] that will be used solely indoors to overcome signal attenuation from a building or vehicle that completely encloses the MT (as opposed to being used to overcome outdoor signal attenuation), and (ii) MSV will not extend the edge of coverage of its ATC cells beyond the point where its mobile terminals could operate beyond a certain power level. As to the first element, MSV has not even attempted to show that the 63x

[35] Section 316 of the Act provides licensees the right to advance notice of any proceeding that would modify their licenses, and an opportunity to object. *AMSC Subsidiary Corporation v. FCC*, 216 F.3d 1154, 1158 (D.C. Cir 2000) ("we regard 'a license [as] modified for purposes of section 316 when an unconditional right conferred by the license is substantially affected.'"); *see also Aircell, Inc.*, 15 FCC Rcd 9622, 9636 (2000) (Section 316 not invoked because cellular licensees were not required to accept harmful interference).

[36] In terms of power, 18 dB equals 63 times.

power factor would not also be used while an MT was outside. As to the second element, MSV described some theoretical techniques it could employ to comply with the power constraint, but MSV has not committed to actually employing those techniques.

The Bureau dismissed both of Inmarsat's objections, (i) indicating that it does not agree that Section 25.253(a)(8) requires an applicant to demonstrate that the emitted power of its MTs will never exceed –18 dBW (the 63x power factor) when they are operated outdoors, and (ii) indicating that it interprets MSV's application as containing commitments about how the edge of cell power will be limited.[37]

Enforcement of these requirements is critical to constraining interference into Inmarsat spacecraft to manageable levels. Even if MSV complies with all the other restrictions imposed by the Commission, if its ATC mobile terminals operate at *full power* while outdoors (*i.e.,* at 18 dB or 63x higher than otherwise permitted), then a few dozen ATC terminals operating on the same channel could produce the same interference impact as the overall 1725 co-channel reuse limit set by the Commission in the *ATC Order*.[38] Review is further warranted because the Bureau has acted on an ATC rule interpretation that is currently subject to reconsideration by the full Commission, it has ignored clear language in the *ATC Order* to Inmarsat's detriment, and it also has ignored the plain absence of any commitment by MSV to comply with these provisions and thereby protect Inmarsat from interference.

A critical element underlying the Commission's analysis in the *ATC Order* was the need to constrain the power generated by ATC terminals that could reach Inmarsat spacecraft. In this regard, the Commission considered that the power level emitted by an ATC terminal that could cause interference to Inmarsat is the power level of the terminal, less a

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[37] *MSV Order* at ¶¶ 31-32.

[38] Technical Annex at 2.1.

number of interference reduction factors,[39] the most important of which is a 20 dB power control factor. The main component of this power control factor is the 18 dB "structural attenuation" factor.[40] The Commission clearly defined "structural attenuation" as reduction in signal strength that takes place when an ATC mobile terminal transmits within a building, automobile of other structure that completely encloses it.[41] The Commission distinguished that effect from "outdoor blockage," which occurs when an obstacle interrupts the line-of-sight path to a transmitter. Then, the Commission stated:

> "Our understanding of cellular system design is, for example, if a user standing in the open at the edge of the cell coverage area accesses the ATC system, the MT would be requested . . . to reduce its power by the full 18 dB of structural attenuation because no structural attenuation exists between the user MT and the base station."[42]

The assumptions underlying the Commission's decision to authorize ATC in the L-Band remain true only as long as the ATC operator actually complies with the requirement that 18 dB of potentially interfering power *not* be used while outdoors. As explained in Section 2.1 of the Technical Annex, terrain or another structure exists outdoors that shields an ATC user from the base station, and that terminal increases its power by up to 63x to overcome that obstacle, Inmarsat clearly would suffer increased satellite interference that the Bureau has not accounted for.

The Bureau is wrong when it states that the structural attenuation requirement is the same as the requirement to limit the size of ATC cells to ensure mobile terminals do not need to exceed certain power levels under free space conditions. This interpretation would render irrelevant the definition of structural attenuation in the rules, as well as the use of that term in

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39 The factors are: 25 dB Inmarsat-4 satellite antenna discrimination, 3.1 dB outdoor blockage, 20 dB power control, 3.5 dB vocoder factor, 1 dB voice activity, and 1.4 dB polarization isolation.

40 *ATC Order* at 2152 (Appendix C2 § 1.3.5).

41 *Id.* at 2034 (n. 375), 2109 (Appendix B § 25.201), and 2151 (Appendix C2 at n. 69).

42 *Id.* at 2151 (Appendix C2 at § 1.3.1).

Section 25.253(a)(8). To the contrary, Section 25.253 of the Commission's Rules, and paragraph 142 of the *ATC Order*, establish different and separate key parameters under which ATC must operate in order to limit interference to MSS systems in the L-Band.

First, Section 25.253(a)(8) and paragraphs 140 and 142 of the *ATC Order* expressly mandate that an L-band ATC system must be designed with at least an 18 dB link margin *allocated for structural attenuation.* The Commission acknowledged in paragraph 140 of the *ATC Order* that this power limitation requirement embodies a critical technical assumption underlying the Commission's evaluation of potential interference into Inmarsat's network, and therefore underlying the Commission's decision to allow ATC in the L-band.[43] This requirement obligates the L-Band ATC applicant to demonstrate how it will comply to ensure that its ATC system does not exceed the interference level assumed in the Commission's analysis.

Second, after twice discussing the 18 dB structural attenuation factor, the Commission continued on to adopt a distinct and separate requirement, "*in addition,* MSS licensees shall not extend the coverage area of any ATC cell beyond the point where an ATC MT could operate at the edge of coverage of the ATC cell with a maximum EIRP of –[18] dBW."[44] The Commission would not have used the words "in addition" to introduce the edge of cell coverage prohibition if all it were doing was repeating a requirement already discussed twice before. Thus, the Bureau's suggestion that the "underlying intention" of the structural attenuation limitation "was to bar licensees from extending a base station's edge of coverage"[45]

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[43] "Our analysis assumes . . . that the link budget for ATC reserves a minimum of 18 dB for structural attenuation . . . .". *See also ATC Order* at 2035, 2152 (Appendix C2 § 1.3.5) ("analyses is based on the expectations that MSV will implement the full 18 dB of margin for structural attenuation that they state is 'per standard PCS design practices'").

[44] *See ATC Order* at 2036 (emphasis supplied). There is a typographical error in paragraph 142 of the *ATC Order*, which Inmarsat has requested be corrected, and which the Bureau recognized as an error in footnote 60 of the *MSV Order*. The *ATC Order* references a 10 dB margin when it meant an 18 dB margin.

[45] *MSV Order* at ¶ 32.

is belied by the Commission's own explanation in the *ATC Order*.

There are ways that MSV could comply with both the letter and intent of the Commission's rules. For example, in order to ensure that an ATC mobile terminal automatically operates at a lower transmit power when outdoors, the terminal could contain a built-in GPS receiver in the handheld. If the mobile terminal "sees" any GPS satellite, it would assume that it is operating outdoors. The indoor/outdoor information would be constantly reported (embedded in the signalling) to the terrestrial base station, where it could be monitored and recorded.

Inmarsat objected to MSV's failure to comply with the structural attenuation requirement and the edge-of-cell limitation. Appendix E of MSV's November 18, 2003 *ATC Application* provides merely a description of one *possible* measure that MSV *might* be able to employ to ensure compliance with this rule. MSV's explanation is replete with the carefully chosen words "can design" and "may be configured." No where does MSV commit to implement any of the described measures or any of the other "variety of ways" that MSV refers to but does not explain or even describe.[46] Worse yet, it is not even clear that MSV *will* comply. MSV states to the contrary: "If less structural attenuation is used, the maximum number of base stations permitted under Section 25.253(a)(9) will be reduced or a showing will be made that there would be no increase in interference to other MSS operators . . . ."[47] But we do not know how that will be accomplished, or whether MSV's solution will be adequate.

Thus, the Commission has no way of knowing how MSV will comply with its rules. The vague statements that MSV made are hardly the "demonstration" mandated by Section 25.253(a)(8). Nor should a mere certification by MSV suffice. Just last year, in the context of revising its satellite licensing rules, the Commission rejected the idea that a licensee

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[46] As discussed in Inmarsat's Opposition, the one method that MSV describes fails to ensure that all terminals operating outdoors will reduce their maximum EIRP by at least 18 dB.

[47] *ATC Application* at 15-16.

should be able to merely certify compliance with a license milestone.[48] The same result should obtain here, where the economic interests of the licensee are contrary to the dictates of the rule.

C. The Bureau Erred in Allowing Increased ATC Base Station Power and Relaxing Base Station Antenna Performance Requirements

In granting MSV's requested waivers to increase ATC base station EIRP by a factor of 6.3 (8 dB) and also to deploy lower performance base station antennas, the Bureau committed three errors: (i) it miscalculated the impact of the waivers and failed to take into account the combined interference effect resulting from the grant of both waivers, (ii) it failed to adequately address the increased intermodulation effects that would result from the power increase, and (iii) it simply ignored objections that Inmarsat raised and evidence that Inmarsat presented.

As an initial matter, for the reasons provided in Section III.A. above, allowing MSV to deploy "high powered" ATC base stations significantly expands the size of the "exclusion zones" around an ATC base station where an Inmarsat mobile terminal will not work. This affects the deployment of land mobile MSS service by punching "swiss cheese" holes throughout Inmarsat's service area in the United States. Section 1.2 of the Technical Annex explains why the Commission's calculation substantially understates of the size of these zones.

These waivers also present problems for the deployment of aeronautical MSS terminals. As set forth in Section 1 of the Technical Annex, the base station power increase waiver and the base station antenna performance waiver are integrally related and combine to increase the potential interference into Inmarsat aeronautical terminals. This is a significant problem because it could result in interference to Inmarsat broadband services being provided to airplanes, even those far away from airports. In its Opposition, Inmarsat explained the serious threat to its aeronautical receivers posed by higher-power ATC base station operations. Inmarsat

[48] *In the Matter of Amendment of the Commission's Space Station Licensing Rules and Policies and Mitigation of Orbital Debris*, 18 FCC Rcd 10760, 10831 (2003).

explained that MSV's analysis in its *ATC Application* was flawed, and, as a result, the aggregate power limit per MSV base station sector should be significantly lower than MSV advocated. Specifically, Inmarsat asked the Commission not to allow MSV to increase the power of its ATC base stations, to deny MSV's request for a waiver of § 25.253(d)(1) and instead, to reduce the base station power from that specified in the current ATC rules.[49]

Without so much as an explanation, the Bureau simply disregarded Inmarsat's analysis and a test report from Inmarsat's manufacturer, NERA. The Bureau makes a passing comment that Inmarsat did not respond to MSV's subsequent request for a partial power increase, rather than a full power increase,[50] which observation is wholly irrelevant because Inmarsat opposed *any* power increase, and actually explained that a power *reduction* was warranted. Then, the Bureau simply requires MSV to "notify" Inmarsat if MSV would operate above the power limit of the current rules, and indicates that it expects MSV and Inmarsat to "work together" to resolve any intermodulation problems.[51] Similarly, the Bureau ignored evidence from Honeywell about the receive sensitivity of Inmarsat aeronautical terminals, and simply reasserted that the existing rules provide an adequate margin against overload of an airborne MET receiver.[52]

Inmarsat raised serious interference issues and supported its assertions with technical explanations and a test report. The law is clear that the Commission cannot summarily sweep aside such objections, and the failure to do so is reversible as arbitrary and capricious.

Moreover, attempting to sidestep the intermodulation problem by referring the matter to coordination between the parties is inconsistent with the policy determination discussed

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49 *Inmarsat Opposition* at 51.

50 *MSV Order* at ¶ 13.

51 *Id.* at ¶ 82.

52 *Id.* at ¶ 80.

above that ATC is a secondary service, the determination that variations from the baseline ATC architecture are permissible only if that they do not result in greater potential interference, and the requirement that MSV modify its ATC operations if interference does occur.

In any event, coordination here is likely to be futile. As Inmarsat informed the Commission in October 2001, since 1998, MSV and its predecessors have delayed and impeded the negotiation of a spectrum operating agreement under auspices of the Mexico City MOU, and thus have prevented the reassignment of spectrum among the parties. Since MSV has dragged its feet and refused to negotiate while it awaits Commission action on ATC, there is no reason to think MSV would make any concessions to Inmarsat to reduce the interference impact of its ATC operations.

D. The Bureau Erred in Taking into Account Average ATC Mobile Terminal Antenna Gain

The Bureau has granted a relaxation of the 1725 co-channel reuse limit that is critical for constraining interference into Inmarsat spacecraft. The Bureau based its decision on MSV's claim that an ATC mobile terminal's *average* antenna gain should be used in the interference calculations instead of the *peak* antenna gain specified in the ATC rules. Thus, the Bureau waived the strict application of Section 25.253(g)(1), which expressly requires that the ATC mobile terminal be limited to a peak power level with which MSV admittedly does not comply. The Bureau reasoned that even though peak power was used to determine the co-channel reuse limits in Section 25.253(g)(1), the underlying purpose of that provision is satisfied by taking into account the average power of MSV's mobile terminals.[53]

The Bureau erred in granting this waiver in isolation, and not taking into account offsetting factors. Altering or waiving one ATC parameter affects the margin available to accommodate other variables in the Commission's ATC interference analysis. Indeed, given that

[53] *MSV Order* at ¶ 56.

there are degrees of uncertainty surrounding many of the Commission's assumptions about ATC interference, the Commission has decided to phase in its ATC co-channel reuse limits over time. As set forth in Section 2.2 of the Technical Annex, a number of variables could increase the actual ATC interference experienced by Inmarsat. For example, and as discussed above, the Commission has failed to account in its uplink interference analysis for two Inmarsat orbital locations that will be much more susceptible to interference than the Commission has assumed, and whose effect would almost entirely offset the average antenna gain factor the Commission has identified.

It is manifestly unfair for the Bureau to "refine" its interference assessment by taking into account only the factors that favor MSV. If a renewed approach to the interference analysis is to be taken, then it must include a range of other issues, such as those identified in Section 2.2 of the Technical Annex, which will negate, and possibly outweigh, the advantages of using an ATC mobile terminal's *average* antenna gain. The Bureau's decision to ignore Section 25.253(g)(1), and its selective use of new technical data, are unjustified and should be reversed.

IV. CONCLUSION

For the reasons discussed above, Inmarsat requests that the Commission reverse the Bureau's decision in this matter.

Respectfully submitted,

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Appendix A

Technical Annex – December 8, 2004

1. Downlink Interference Issues

The waivers of the ATC rules in the International Bureau's order granting ATC authority to MSV substantially increase the risk of harmful interference into aeronautical, maritime and land mobile terminals that seek to communicate over the Inmarsat system.[1] In simple terms, the relaxation of the base station EIRP limit increases interference levels to Inmarsat mobile terminals in the vicinity of ATC base stations by 8 dB. Furthermore, the relaxation of the overhead antenna gain suppression increases interference levels to aeronautical earth stations by an additional 8 to 10 dB.

In the *ATC Order*, the Commission adopted a level of protection for Inmarsat mobile earth terminals that ensures that Inmarsat services can continue to be deployed without harmful interference from ATC.[2] The Commission wisely determined that due to the inherent uncertainty in the technical analyses that had been performed, and "recognizing the importance of providing adequate interference protection to Inmarsat, and in particular the safety-related services it provides to ships and aircraft," it was constraining the deployment of ATC base stations to 50% of its maximum permitted level during an initial 18-month, phase-in period, and that such a limitation would provide an additional 3 dB of protection for Inmarsat during initial deployment, and would permit Inmarsat and MSV to study whether any interference has resulted, giving enough time to observe any seasonal variations and to analyze the results of the study.[3]

In light of this policy, and the technical analysis provided below, there is no basis for relaxing those protections now, in order to allow MSV to operate ATC base stations at 6.3 times (i.e., 8 dB) the power previously permitted, and to also effectively increase the level of interference generated toward aircraft that use or will use Inmarsat service by a factor of up to 63 times (i.e., up to 18 dB).

As an initial matter, the Bureau was wrong when it asserted that Inmarsat did not object to the 8 dB relaxation of the base station EIRP limit.[4] Inmarsat's position could not have been clearer—in addition to opposing an increase in ATC base station power, Inmarsat twice urged the Bureau to *reduce* permitted ATC base station power:

> [T]he current limit in § 25.253(d)(1) should in fact be reduced by 15 dB, rather than increased by 15 dB as MSV proposes. As a result of the above, Inmarsat

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1 *In re Applications of Mobile Satellite Ventures Subsidiary LLC,* DA 04-3553 (rel. Nov. 8, 2004) ("*MSV Order*").

2 *Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands*, 18 FCC Rcd 1962 (2003), *Errata*, IB Docket Nos. 01-185 and 02-364 (March 7, 2003), *on reconsideration*, FCC 03-162 (July 3, 2003) ("*ATC Order*").

3 *Id.* at 2036).

4 *MSV Order* at ¶¶ 13, 78.

> urges that the Commission deny MSV's waiver request and proposes that MSV comply with an aggregate EIRP limit per base station sector of 8.9 dBW, and not 38.9 dBW as proposed by MSV.[5]

Inmarsat then re-emphasized its point:

> Inmarsat urges that the Commission deny MSV's waiver request and adopt an aggregate EIRP limit towards the horizon of 3.9 dBW, which is 15 dB less than the current rule, as requested in Inmarsat's Petition for Reconsideration.[6]

Thus, Inmarsat disagreed with any proposed increase in MSV's ATC base station EIRP. In the context of this proceeding, Inmarsat has presented analyses from two of its manufacturers---NERA and Honeywell---demonstrating the susceptibility of the Inmarsat METs to high-level, adjacent-band signals from L-band ATC base stations.[7] In fact, based on test data and analysis that Inmarsat submitted about the interference susceptibility of its mobile terminals, Inmarsat urged that ATC base station power limits be tightened rather than relaxed, and that MSV's waiver requests be denied.

The Bureau's relaxation of certain ATC base station limits is also unfounded for the following reasons:

1.1. <u>Relaxation of the overhead gain suppression of the ATC base station antennas.</u>[8]

There is no basis for granting MSV's request for a waiver to relax overhead gain suppression requirements by 8 and 10 dB from maximum gain for angles between 30° and 145°. MSV argued that such a significant increase in the interfering signal level as this would produce only 0.03 dB additional interference to airborne Inmarsat terminals. Clearly, when an aircraft is at a location in the sky, relative to an MSV base station, that corresponds to the angular range 30° to 145° from maximum gain, then the increase in interference from that base station will be between 8 and 10 dB, and not 0.03 dB. This is indisputable. MSV's assertion of a mere 0.03 dB increase is based on its calculations of the aggregate effect of 1000 ATC base stations within a circle of 50 mile radius centered on the aircraft, withthe aircraft at an altitude of 1000 ft (302 m).

What neither MSV nor the Bureau recognized is that at lower altitudes fewer ATC base stations would be visible by the aircraft, and the relative interference effect of the base stations below the aircraft would be greater. Therefore, Inmarsat's calculation considers only the case of a single ATC base station causing interference to an airborne receiver, not because this is the worst case situation, but because, if it demonstrates a potential interference problem, then the aggregate affect of multiple base stations would certainly create an even greater problem. For the case of a single base station, the reduction of 8 to 10 dB in the overhead gain suppression of the ATC base station antenna results in a corresponding 8 to 10 dB increase in the interference.

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5 *Opposition of Inmarsat Ventures Ltd* at 51 (filed Mar. 25, 2004) ("*Inmarsat Opposition*").

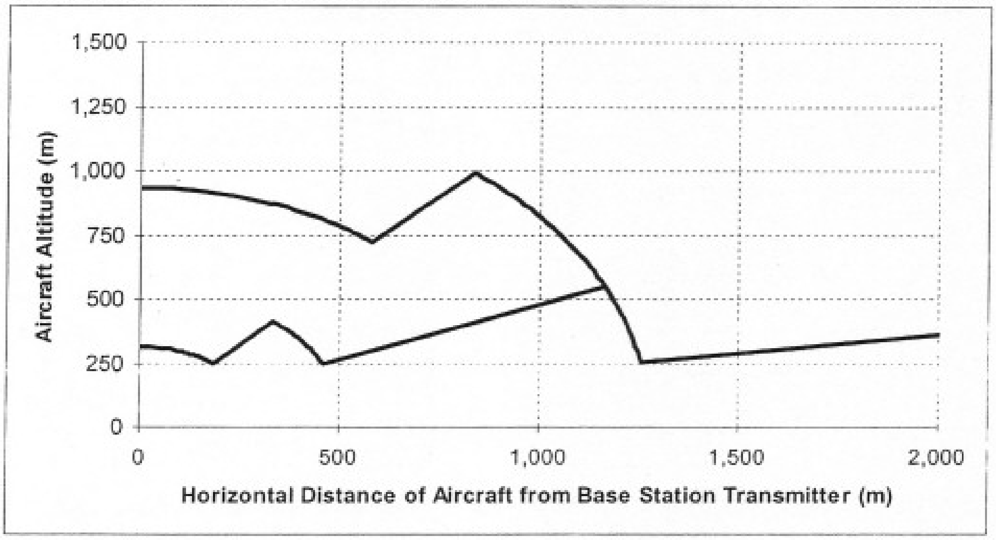
6 *Id.* at 52.

7 *Id.* at Appendices B and C.

8 *MSV Order* at ¶¶ 69-71.

In its ATC opposition in March 2004, Inmarsat demonstrated, by analysis of a single ATC base station, the impact on aircraft of granting this waiver---the resulting increase in the safe height an aircraft would need to maintain above an ATC base station.[9] The key result is shown in Figure 1 below, which clearly shows in the upper line (for horizontal distances less than approximately 1,200 meters) the increased safe distance of the aircraft from the base station resulting from grant of the requested overhead gain suppression waiver, compared to the lower line which gives the safe distance assuming compliance with the gain suppression values and other limits in the ATC rules. Note that, for the situation analyzed in Figure 1, for horizontal distances greater than approximately 1,200 meters and altitudes greater than approximately 500 meters, the ATC base station antenna gain is not affected by the proposed relaxation. Although the Bureau accurately summarized this analysis at one point,[10] it subsequently dismissed these results based on its determination that this represented an "unexplained contention" by Inmarsat.[11]

Figure 1: Impact of Relaxing the Overhead Gain Suppression of the ATC Base Stations on the Safe Distance of an Aircraft from the ATC Base Station (-75 dBm interference threshold)



Inmarsat's analysis and position on this matter cannot be ignored as "unexplained". It was clearly presented in Inmarsat's opposition and it was derived from a straightforward calculation of the interfering signal arriving at the aircraft from the base station. The assumptions about the interference susceptibility of the Inmarsat receiver were also clearly stated to be -75 dBm at its input, as supported by the report from Honeywell that Inmarsat included as Appendix C to its Opposition.

Nor did the Bureau explain how this technical analysis of interference into licensed services is "outweighed" by comments in favor of the waiver request filed by NTIA.

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9 *Inmarsat Opposition* at 59-60.

10 *MSV Order* at ¶ 70.

11 *Id.* at ¶ 71.

NTIA may speak for the FAA and other Federal executive branch agencies, but NTIA does not represent the interests of commercial and private aircraft operators who use or will use current or future Inmarsat aeronautical services. Furthermore, the analysis on which NTIA based its assessment assumes an interference threshold of -50 dBm based on the 1 dB compression point of the receiver LNA alone, and totally ignores the appropriate interference threshold when intermodulation product interference is taken into account.[12]

Inmarsat has already provided in the record an expert assessment from Honeywell, which manufactures aeronautical Inmarsat receivers, that explains why the -50 dBm level that NTIA is still using in its analysis is simply not appropriate in assessing when the Inmarsat receiver will fail to function correctly. Specifically, Honeywell provides the correct interpretation of the ARINC specifications to which NTIA refers. ARINC Characteristics are not mandatory specifications but suggested avionics implementation guidelines primarily to foster interchangeability. Some manufacturers develop products conforming to the Characteristics; others do not. The RTCA minimum performance standards DO-210D is the only set of mandatory specifications and nothing in those specifications requires an AMS(R)S receiver to function normally with an interference level as high as -50dBm. Therefore, NTIA's conclusions in this regard are simply wrong.

The Commission expressed the view that -50 dBm is the relevant interference threshold for aeronautical terminals.[13] While Inmarsat disagrees with this, as explained above, it is important to note that significant interference problems would occur, even using an interference threshold of -50 dBm, when the combined effects of the two proposed base station relaxations (base station EIRP increased by 8 dB and base station antenna gain suppression relaxed by 8 to 10 dB), are taken into account. The Bureau failed to address this critical combination of relaxations, which compound on each other in terms of the safe distance of the aircraft from the ATC base station, as explained in the next section.

1.2. Relaxation of the ATC base station EIRP limits.[14]

The Bureau failed to consider the cumulative effect of the waivers it has granted. The Bureau argued that the situation of interference to Inmarsat's maritime and airborne METs is unchanged by the 8 dB increase in permitted base station EIRP because of the corresponding increase in the required separation distances and the maintaining of the PFD limits at the boundary of navigable waterways and at all airport runways, taxiways, landing paths and stand areas.[15] This is true, to a point. But the Bureau failed to take into account the situation of airborne METs that are on aircraft in flight, and either on approach routes or take-off routes, and which are now cumulatively affected by the waivers granted in the Order. The 8-10 dB relaxation in the ATC base station overhead gain suppression (addressed in Section 1.1 above),

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12 Letter (with attachment) from Frederick R. Wentland, Associate Administrator, NTIA Office of Spectrum Management, to Edmond J. Thomas, Chief, FCC Office of Engineering and Technology, at 5, dated April 21, 2004.

13 *ATC Order* at 2038-2039.

14 *MSV Order* at ¶¶ 76-84.

15 *Id.* at ¶ 80.

combined with the 8 dB increase in the ATC base station EIRP limits, will dramatically increase the required safe separation distance between aircraft in flight and ATC base stations.

The combined effect of these two waivers poses a significantly increased threat of interference to aircraft when they are at relatively high altitudes and horizontal distances from the airports. The proposed compensating increase in separation distances from airports, or the maintaining of PFD limits at airports, will do nothing to solve the increased problems of interference to aircraft in flight.

The results of the combined effect of the Bureau's waiver grants are shown in Figures 2 and 3 below, where the necessary separation distances are given in terms of the altitude and horizontal distance from the aircraft to the ATC base station, as for Figure 1 above. Figure 2 assumes the -50 dBm interference threshold level that the Bureau proposes to use for this analysis. Figure 3 shows the same information, but with the -75 dBm interference threshold that Inmarsat believes should be used based on data from its manufacturers, as previously presented. On both of these Figures, Case 1 is the result using the limits in the ATC rules. Case 2, which only differs from Case 1 over a limited horizontal separation distance, is the result when the ATC overhead antenna gain suppression is relaxed by the 8-10 dB. Case 3 is the result when the ATC overhead antenna gain suppression is relaxed by the 8-10 dB *and* the ATC base station EIRP is relaxed by 8 dB. Note that in both Figure 2 and Figure 3 there is a dramatic increase in the vertical distance separation required when the aircraft is over the ATC base station.

In assessing the results in Figures 2 and 3 we must keep in mind that these results are for the interference from a single ATC base station only, and that the aggregate interference from more than one ATC base station, which will likely occur simultaneously, as assumed by the Commission in the *ATC Order*, will be correspondingly worse. With this in mind, Figure 2 already shows a significant interference problem, despite the assumption of a very high interference threshold (-50 dBm). In fact, even without any change in the FCC limits, the interference distance to aircraft at an altitude of 90m is greater than the distance limitation of 470m. With the relaxations in base station EIRP and overhead gain suppression, harmful interference will occur from a single ATC base station when the aircraft altitude is less than 190 meters (623 ft) and at horizontal distances up to 2,250 meters (1.4 miles). The results in Figure 3, which assumes the interference threshold of -75 dBm, as evidenced by Inmarsat's aeronautical terminal manufacturers, are very much worse, with interference problems occurring at aircraft altitudes up to 2,800 meters (1.7 miles) and horizontal distances up to 40 km (25 miles). Clearly, the FCC's proposed distance separation limits and PFD limits relative to airports, even if these are modified to account for any correction in the interference threshold, will have absolutely no impact on overcoming the interference caused by the combination of relaxing the overhead gain suppression requirements and increasing ATC base station EIRP. These results demonstrate that the combination of the two relaxations proposed by the Bureau would have a serious impact in terms of interference into airborne terminals. Therefore, it is essential that the Commission correct the error made in granting the waivers to MSV.

Figure 2: Impact of Relaxing the Overhead Gain Suppression of the ATC Base Stations, and Increasing its EIRP by 8 dB, on the Safe Distance of an Aircraft from the ATC Base Station (-50 dBm interference threshold)

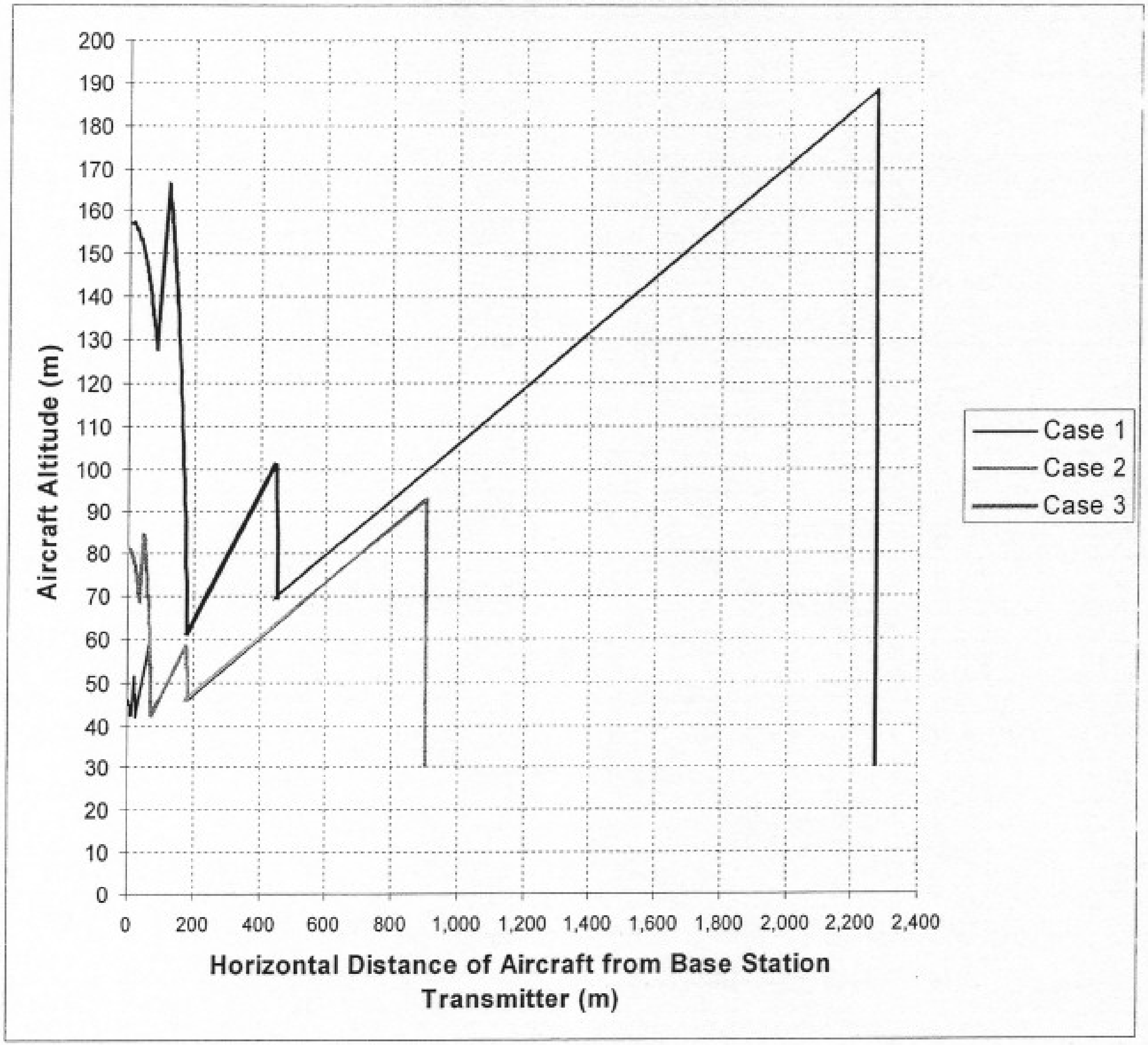
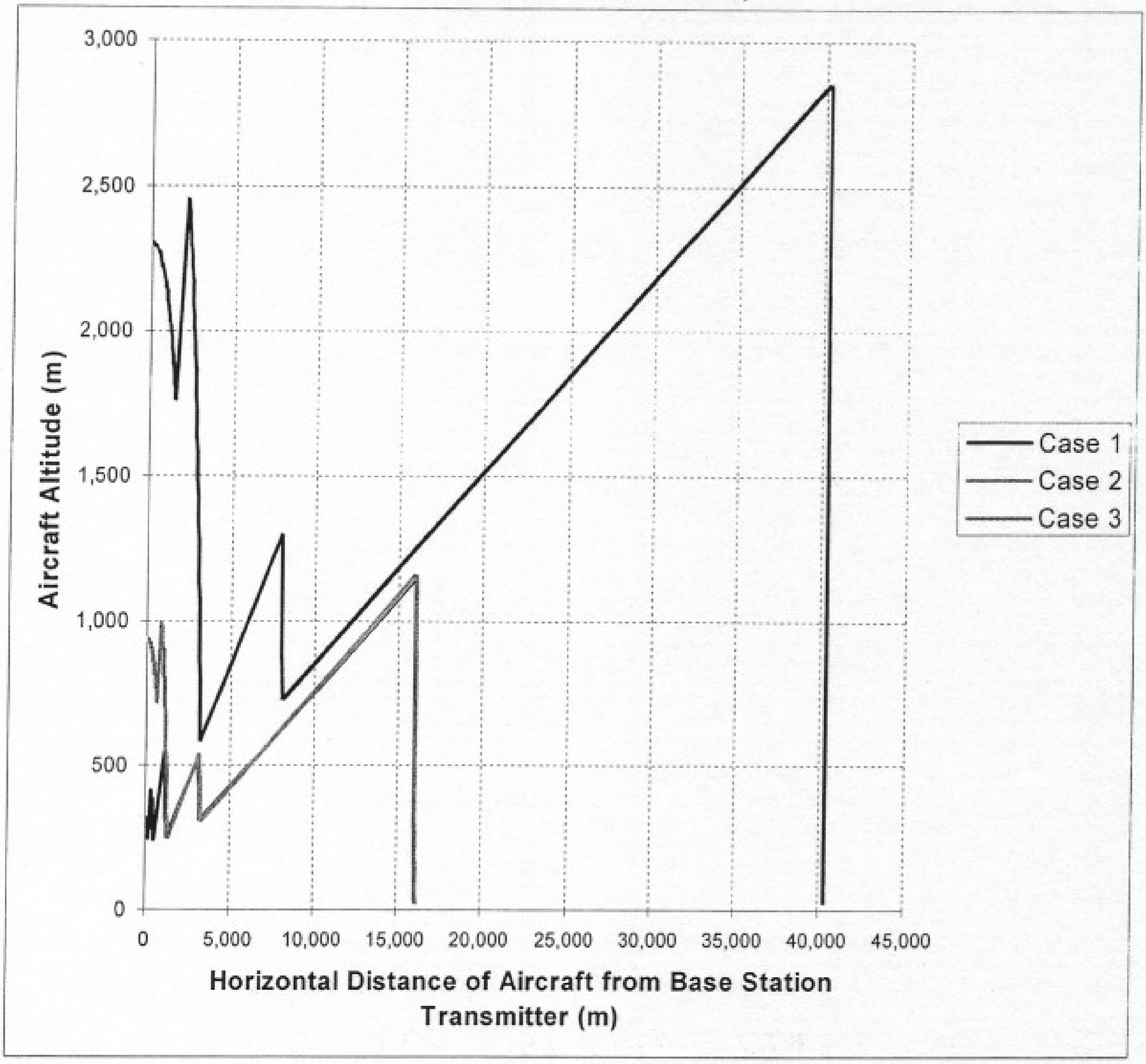


Figure 3: Impact of Relaxing the Overhead Gain Suppression of the ATC Base Stations, and Increasing its EIRP by 8 dB, on the Safe Distance of an Aircraft from the ATC Base Station (-75 dBm interference threshold)



The Bureau was wrong that, under "very conservative" studies, increasing ATC base station EIRP by 8 dB would have only a small impact on the zone around an ATC base station where an MET would be subject to overload or intermodulation product interference.[16] In particular, the Bureau concluded that the minimum separation distance for Inmarsat land-based METs will increase from 100 meters to just over 200 meters, as a result of the 8 dB increase in the ATC base station EIRP limit (based on the –60 dBm overload threshold assumed by the Bureau for land based Inmarsat terminals).[17] The Bureau argued that this increase is unlikely to result in interference issues.

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16 *MSV Order* at ¶ 81.
17 *Id.*

This is wrong for a number of reasons. Inmarsat land mobile terminals are currently used in urban areas where the Commission anticipates ATC will be deployed, and this circumstance is even more likely to exist with the roll-out of Inmarsat's forthcoming BGAN service, which will offer a more robust and more attractive land mobile service than ever before. Second, the Bureau's analysis is based on flawed propagation assumptions.

As an initial matter, the analysis to which the Bureau refers in the *ATC Order* that established an ATC base station separation distance of 100 meters assumed a propagation model that was not fully explained, but which involved 10 dB more attenuation (at 100 meters) than a line-of-sight model, which would be the appropriate model to use in many of the cases where ATC may be deployed. There is simply no basis to assume that "most ATC base stations are likely to be in urban areas in order to boost MSV's weak satellite signals."[18] There is no limitation in the ATC rules about where ATC can be deployed, and MSV is not restricted in its license to deploying ATC only in urban areas. Moreover, one need only to look around the greater Washington DC metropolitan area---an urban area for US census purposes – to realize that the term "urban" compasses many areas where a clear line of sight to an ATC base station is very likely to occur – particularly in areas such as Fairfax County and Montgomery County where ATC roll out appears feasible.

Thus, is establishing the likely exclusion zones around ATC base stations, use of a line-of-sight propagation model is perfectly appropriate for many situations involving such short distances as 100 meters. Indeed, Industry Canada recognized the propriety of considering free space propagation characteristics in an analogous situation---assessing the interference impact of DARS terrestrial repeaters into terrestrial wireless networks, and for separation distances from a few hundred meters to several kilometers.[19] Using free space propagation characteristics, the interference margin for an Inmarsat terminal at 100 m distance from an ATC base station would change from +1.8 dB to –8 dB, and the separation distance would increase to up to 250 meters from an ATC base station, using the Commission's own analysis. Hence, there is a risk of harmful interference around an ATC base station even if the base station EIRP limit is not changed.

Taking into account the 8 dB increase in ATC base station EIRP, there would be a -16 dB (*negative*) margin at the receiver in free space conditions, corresponding to a separation distance of over 600 m.[20] This represents a significant increase in the interference to which Inmarsat will be subject as a result of ATC deployment, and it is fundamentally inconsistent with the principles in the *ATC Order*, which established a secondary terrestrial service in the L-band, while establishing a carefully crafted set of interference protections for the primary MSS. Based

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18 *Id.*

19 *A Staff Study on the Potential Impact of Satellite Digital Audio Radio Services Terrestrial Repeaters on Wireless Communications Service Receivers Operating in the Adjacent Band at 2.3 GHz*, Industry Canada at 3 (Dec. 2003) (*available* at http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/vwapj/dars_e.pdf/$FILE/dars_e.pdf).

20 If the Inmarsat threshold value of -75 dBm is used this negative margin increases to -31 dB. Clearly, at such a margin, Inmarsat's land-based terminals would be seriously impacted by the ATC base stations, and would not be able to operate anywhere in the vicinity of them, even in urban areas. However, Inmarsat assumes that the Commission would adjust the base station EIRP limit accordingly, if it finds that the interference threshold is different from –60 dBm.

on the points discussed in the previous paragraphs, Inmarsat urges the Commission to reverse the Bureau's decision to relax the EIRP limits on ATC base stations by 8 dB.

A key factor in determining the interference threshold of Inmarsat receivers is the intermodulation interference resulting from two or more transmitted carriers of the ATC base station that produce intermodulation products that may fall in the pass-band of the Inmarsat receiver, due to receiver nonlinearities. The Bureau rightly pointed out that its proposed 8 dB relaxation in ATC base station limits will exacerbate this problem.[21] However, the Bureau simply left this significant interference effect for resolution by a commercial negotiation between MSV and Inmarsat.

This approach is unsatisfactory. Inmarsat needs to have the ability to use all its frequencies across the entire coverage of its system, which includes areas near ATC base stations. Hence, no burden can be put on Inmarsat to avoid certain frequencies to accommodate interference from MSV ATC intermodulation products. In theory, the FCC could put a requirement on MSV to make sure that no ATC carriers are deployed that form IM products in Inmarsat spectrum. However, there is no reason for MSV to cooperate by selecting base station carrier frequencies in a way that might reduce the chance of intermodulation products falling within Inmarsat receive bands. Intermodulation interference should be accounted for in the FCC tests of Inmarsat terminals and hence in the assumed interference threshold, and the ATC limits should be adjusted according to the results of those tests to ensure that the potential for interference to Inmarsat terminals is maintained at an acceptably low level.

2. Uplink Interference Issues

2.1. Link Margin for Structural Attenuation

The Bureau stated that it believed that MSV had complied with the ATC rules regarding the 18 dB structural attenuation factor.[22] The Bureau dismissed Inmarsat's request that MSV demonstrate that ATC mobile terminals operated outdoors never use an EIRP greater than –18 dBW and stated that the underlying intention of the 18 dB requirement was to bar licensees from extending a base station's coverage area to such an extent that a mobile terminal at the edge of the area would have to transmit at an EIRP higher than –18 dBW merely to overcome free space path loss.[23] The consequence of this new interpretation is to allow MSV to cause additional interference to Inmarsat satellites, as discussed below.

The 18 dB structural attenuation requirement is needed to ensure that the 20 dB power control factor assumed in the FCC's interference analysis in the *ATC Order* is valid. To put it another way: the FCC assumed that the *average equivalent outdoor EIRP* of all ATC mobile terminals is not above -20 dBW, as clearly shown in Table 2.1.1.A in the *ATC Order*.[24]

21 *MSV Order* at ¶ 82.

22 *Id.* at ¶ 31-32

23 *Id.*

24 In the referenced table the "Power Control Factor" value of 20 dB is used to reduce the average effective EIRP to a value of 0 dBW minus 20 dB = -20 dBW. This averaging is meant to take into account the power control effects necessary to address range compensation, structural attenuation and body absorption. *ATC Order* at 2152 (Appendix C2 § 1.3.5)

As discussed in the *ATC Order*[25], this average equivalent outdoor EIRP is the same regardless of whether the MT is operated outdoors, indoors, in a car or in any other location.

Clearly, the actual equivalent outdoor EIRP of different MTs will vary depending on the MTs operational conditions, i.e. mainly its location with respect to the ATC base station. For example, the requirement referred to above means that MTs at the edge of a cell with line-of-sight to the base station will have an equivalent outdoor EIRP of –18 dBW (or less). MTs inside a cell (but still in line-of-sight conditions) will have somewhat lower equivalent outdoor EIRP. Furthermore, particularly in urban environments, there is a high probability that MTs used outdoors are fully or partially blocked from the ATC base station. It should be noted that also indoor MTs and MTs operated in cars may be subject to additional blockage towards the base station. These situations are illustrated in the diagram below. The critical issue is to ensure that the average equivalent outdoor EIRP for **all** ATC MTs operating on the same frequency is -20 dBW or lower.

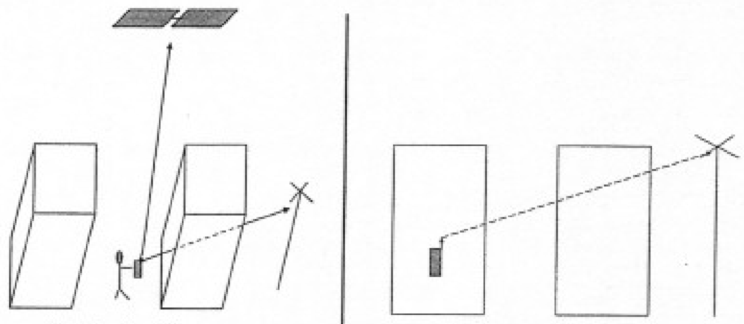

Illustration of possible blockage of outdoor MT

Illustration of possible blockage of indoor MT

In the situation shown in the diagram above, the MT may have to operate at full EIRP to close the link to the base station. In the case of outdoor MTs, as shown in the left part of the diagram above, and taking into account the MT antenna pattern supplied by MSV, the EIRP towards the Inmarsat satellite would then be -4 dBW. This situation would only need to exist simultaneously, at the same frequency, 69 times across the entire USA, to cause the equivalent interference of 1,725 frequency re-uses under the conditions assumed in the Commission's uplink interference analysis as contained in the *ATC Order*. Furthermore, it is apparent from the diagram above that the interference potential from these particular MTs could be even greater than that. If the 3.1 dB outdoor blockage does not apply to these particular MTs, the situation would only need to exist 34 times to cause the same interference level.

Of course, there are likely to be many intermediate situations, where MTs are partially blocked from the base station and need to operate at an equivalent outdoor EIRP somewhere between –20 dBW and -4 dBW. The average amount of signal blockage from outdoor user locations (and equivalent outdoor user locations for MTs in buildings and cars) would need to be determined to establish the interference impact on Inmarsat satellites. Fortunately, the Commission has provided all the data necessary to assess this when it addressed the effect of elevation angles on the average outdoor blockage in the *ATC* Order.[26] The

25 *ATC Order* at 2151 (Appendix C2 § 1.3.1).

26 *Id.* At 2146-2148 (Appendix C2 Figure 1.2.2.C, § 1.2.3).

Commission established the expected average outdoor blockage towards different satellites, ranging from 0.5 dB towards the MSV satellite at 101°W (at about 43°elevation) to 17.5 dB towards AOR-E (at about 12° elevation).[27] Although this blockage data was used to assess the signal blockage between MTs and various satellite positions in the sky, it can also be applied to assess the signal blockage between the MT and the ATC base station. Since base stations are generally at very low elevation angles (comparable to 12° or less), the FCC data indicates that the average outdoor blockage from mobile terminals towards the ATC base station would be in the region of 17.5 dB.[28]

To work out the average equivalent outdoor EIRP of all MTs, we need to understand a bit more about the distribution of EIRP levels for different MTs in the system. In para 29 of the MSV licensing order the FCC states that MSV has asserted "that when a mobile terminal's line-of-sight propagation path to a base station is unobstructed, its signal power will be reduced by a closed-loop power-control algorithm, implemented in the base station and the mobile terminal, to an average level 18 dB lower than its maximum power". Since the EIRP of an MT is assumed to be -4 dBW (when averaged spatially), this assertion by MSV means that the average EIRP of all MTs in LOS conditions will be -22 dBW. To this value we need to add the average blockage from the MT to the base station to derive the average equivalent outdoor EIRP for all MTs, taking into account that the EIRP of any MT is –4 dBW (when averaged spatially). The following table provides the calculation, using additional assumptions taken from the ATC Order.

User Location	Outdoor	In Car	In Building
Structural attenuation (dB)	0	7	18
Average EIRP in LOS conditions (dBW)	-22	-15	-4
Equivalent outdoor EIRP in LOS conditions (dBW)	-22	-22	-22
Average outdoor blockage (dB)	17.5	17.5	17.5
Average MT EIRP for all MTs (dBW)	-4.5	-4	-4
Average equivalent outdoor EIRP for all MTs (dBW)	-4.5	-11	-22
Percentage of population (%)	30	30	40
Weighted average outdoor EIRP (W)	0.106	0.024	0.003
Weighted average equivalent outdoor EIRP (dBW)		**-8.8**	
Assumed average equivalent outdoor EIRP (dBW)		**-20**	
Interference excess (dB)		**11.2**	

As shown in the above table, with the assumptions discussed above (all of which are taken from the *ATC Order* and the *MSV Order*), and also assuming that an outdoor terminal is not constrained in its maximum output power beyond 0 dBW, the level of interference to the Inmarsat satellite would exceed by about 11 dB that prescribed in the ATC Order.

The above calculation illustrates the critical issue that Inmarsat has raised in the past and that the Bureau has ignored in its Order authorizing MSV, viz. that the 18 dB structural attenuation rule needs to be clarified and MSV has to be required to demonstrate and commit to some mechanism that will overcome this problem. Unless the Commission requires MSV to

27 *Id.* at 2148 (Appendix C2 § 1.2.3).

28 Note that the value is dependent on the elevation angle, and could be considerable more than 17.5 dB for elevation angles lower than 12°.

provide evidence that its ATC system is designed to maintain an average equivalent outdoor EIRP of less than -20 dBW, there is no assurance that Inmarsat will be protected from ATC interference. Inmarsat believes that the only feasible way of achieving this is to limit the peak EIRP of outdoor terminals to –18 dBW, in line with Inmarsat's interpretation of the rule.

Moreover, the Commission addressed the situation of ATC base stations located at the periphery of the ATC service area, as far as compliance with the 18 dB factor is concerned. Initially, the Commission rightly pointed out that MSV "*... describes methods for configuring base stations at the periphery of an ATC service area ...*", but then goes on to suggest that MSV has *committed* to these measures.[29] Inmarsat asserts that MSV has provided no such commitment about how it will configure its base stations to comply with the 18 dB requirement at the periphery of the ATC service area, but rather has simply discussed *possible* measures that could be employed. This lack of commitment from MSV is very significant and needs to be addressed by the Commission.

2.2. Mobile Terminal Antenna Gain

The Bureau granted MSV a 4 dB relaxation of the co-channel reuse limit by accepting MSV's claim that an *average* MT antenna gain of –4 dBi should be used in the interference calculations instead of the 0 dBi *peak* antenna gain specified in the ATC rules.

Inmarsat fully understands that the aggregate interference impact is determined by the average MT EIRP in the direction of the Inmarsat satellite. However, this issue cannot be considered in isolation. Altering or waiving one ATC parameter affects the margin available to accommodate other variables in the ATC interference scenario. Thus, a "piecemeal" change of certain ATC limits raises the risk of inadequately accommodating other aspects of the interference case that may be different than the Commission has assumed in the *ATC Order*.

As the Commission's ATC interference analysis has a number of assumptions with varying degrees of uncertainty, it is appropriate to maintain some conservatism in specifying the limits on ATC. The Commission has recognized this uncertainty, as evidenced by the requirement to phase in ATC deployment over a period of time. It is therefore appropriate to retain the current reuse limit, to ensure that the Inmarsat system will operate without harmful interference.

There are a number of variables in the interference analysis that could give rise to under-estimates of the interference experienced by Inmarsat, and therefore may offset any actually realized reduction in average ATC mobile terminal gain:

1. The location of the affected Inmarsat satellite.

The Commission based its analysis on the assumption that Inmarsat will operate an Inmarsat-4 satellite at 54°W.[30] Two parameters in the Commission's analysis follow from

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29 *MSV Order* at ¶ 30.

30 *ATC Order* at 2159 (Appendix C2 § 1.11).

this assumption – first that the free space path loss from CONUS to the Inmarsat satellite (in the uplink band) will be 188.7 dB, and secondly that the outdoor blockage factor will be 3.1 dB.

Inmarsat has ITU filings for next-generation MSS spacecraft also at 98°W and 104°W. Since those locations are close to the MSV location of 101°W, the effect on the interference analysis would be that the free space path loss becomes 188.3 dB and the outdoor blockage factor becomes 0.5 dB. Hence, the aggregate effect of ATC interference would increase by 3.0 dB.

2. Inmarsat-4 antenna discrimination

The Commission's assumption of 25 dB Inmarsat-4 antenna discrimination is based on the assumption that this is the minimum antenna discrimination required to achieve frequency reuse between MSV and Inmarsat-4.[31] The beam used by the Commission to derive the average antenna isolation is only one of many Inmarsat-4 beams, each with a different gain contour. These different beams therefore would produce different average gain across CONUS.

More fundamentally, the assumption made by the Commission that 25 dB antenna isolation is required to achieve coordination between MSV and Inmarsat-4 is not necessarily the case. Coordination between MSV and Inmarsat-4 has not been completed and may yield a different result to that assumed by the Commission. If it is found that sharing is possible at lower isolation, the impact of ATC interference would increase. Several factors affect this result, such as the actual operational MET power levels in the MSV system, and the actual number of frequency reuses within the MSV satellite system.

Furthermore, the average antenna gain does not factor in the effect of the distribution of ATC users. If relatively more ATC users were located in the areas of the spot beam gain contour which has less discrimination, the average isolation towards the ATC users would be reduced.

Hence, there are uncertainties in the interference calculations that warrant maintaining a conservative approach to ensure that Inmarsat's services are not affected. Specifically, to provide some latitude that accounts for these variables, it is appropriate to base ATC reuse calculations on a 0 dBi *peak* antenna gain.

Therefore, it is inappropriate for the Bureau to refine its interference assessment taking into account only the factors that favor MSV. If a renewed approach to the interference analysis is to be taken, then it must include a range of other issues, such as those highlighted above, which will negate, and possibly outweigh, the advantages of the use of an *average* MT antenna gain. We therefore urge the Bureau not to relax the re-use limit based on the new approach of using the *average* MT antenna gain instead of the *peak* antenna gain, which was used throughout the ATC rulemaking.

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31 *Id.*

Appendix B

News Releases

Fire Department of the City of New York (FDNY) Selects Stratos for Emergency Response Communications

Satellite-based technology provides reliable on-the-scene video, voice and data communications in situations where traditional networks are unavailable or overwhelmed

BETHESDA, MD (October 12, 2004) - Stratos Global Corp. (TSX: SGB), a leading global communications provider and the world's leading distributor of Inmarsat satellite services, today announced it has been chosen by the Fire Department of the City of New York (FDNY) to provide satellite-based emergency response communications, including vehicular and mobile terminals for the dependable transmission of video and voice communications between on-the-scene responders and headquarters locations. The selection follows Stratos' successful technology demonstration for FDNY's field and command center units.

Because they are independent of terrestrial and cellular communications networks, Stratos' satellite-based solutions are particularly advantageous in emergency response situations when traditional technologies may be either unavailable or overwhelmed. FDNY will primarily use the technology to facilitate video conferencing between on-the-scene responders and headquarters personnel.

The contract with FDNY includes the purchase of mobile and vehicular satellite terminals using Inmarsat GAN (Global Area Network) technology, video conferencing units, and laptop computers, as well as systems integration and ongoing service. Mobile and vehicular GAN terminals installed in response vehicles are fully integrated with FDNY's command center at MetroTech in Brooklyn. Stratos' partners in this effort include DVLaptop Inc., EMS Technologies, Global Communications Solutions, and LiveWorks Ltd.

"Recent events, such as those on September 11, 2001, have demonstrated that traditional land-based and cellular communications networks are not always reliable during an emergency," said Jim Parm, Stratos' president and chief executive officer. "Stratos' satellite-based solutions provide a reliable, go-anywhere technology that can travel to the scene of an emergency and provide emergency response teams with the secure and dependable communications capabilities they require, regardless of the status of terrestrial and cellular networks.

"Our technology has proven reliable and effective in the most challenging situations, including with the U.S. military during operations in Iraq," added Parm. "We're pleased to be providing this field-proven communications capability to the Fire Department of the

City of New York, and we look forward to working with other federal, state and local agencies on critical applications for homeland security and emergency response."

The Inmarsat GAN mobile satellite solution being provided by Stratos uses either a roof-top dome or a lightweight portable antenna, approximately the size of a laptop computer, to provide up to 64 kbps of throughput for Internet and e-mail access, fax, large file transfers, video conferencing and high-resolution image transfer. Users can choose GAN's Mobile ISDN service for quick transfer of large data files or Mobile Packet Data Service (MPDS) for "bursty" data applications, such as Internet and e-mail. GAN coverage is available worldwide, across all major land masses, with the exception of the extreme polar regions.

About Stratos
Stratos Global Corp. (www.stratosglobal.com) is a publicly traded company (TSX: SGB) and leading international telecommunications services provider offering customers operating in remote locations a variety of satellite and microwave wireless technologies to provide Internet Protocol, data, and voice solutions through a range of newly emerging and established technologies such as Inmarsat®, Intelsat®, Iridium®, Globalstar®, VSAT, and others. Stratos serves an array of diverse markets including government, military, oil and gas, maritime, industrial, aeronautical, media and recreational users anywhere in the world.

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CERTIFICATION OF PERSON RESPONSIBLE
FOR PREPARING ENGINEERING INFORMATION

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in the foregoing submission, that I am familiar with Part 25 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted therein, and that it is complete and accurate to the best of my knowledge and belief.

Name: Jonas Eneberg
Title: Manager
Spectrum Regulatory Affairs
Inmarsat

Dated: December 8, 2004

CERTIFICATE OF SERVICE

I, Thomas A. Allen, hereby certify that on this 8th day of December, 2004, the foregoing "Application for Review" was served by hand(*) or via first class mail, postage pre-paid, upon the following:

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