



Mobile Satellite Services: Status Check For First Responders

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MOBILE SATELLITE SERVICES: STATUS CHECK FOR FIRST RESPONDERS

Following the 2005 hurricane season, with its devastating storms, businesses and governmental agencies around the United States recognized the benefits provided by Mobile Satellite Services (MSS) with their from-anywhere-to-anywhere availability and consumer-friendly terminals.

These terminals and services are largely immune to the effects of the devastating damage to telecommunications infrastructure seen in the wake of Hurricane Katrina.

2008 is another challenging year, with first responders around the United States already dealing with the beginnings of a busy and difficult season of managing natural disasters. From wildfires in the west to floods in the mid-west, the season has started dramatically, and the National Hurricane Center has just forecast a bad season ahead with 9 major hurricanes predicted. With this in mind, we have reviewed the current status of the existing MSS systems to provide some insight into what users can expect, and what preparations they need to make to ensure they are able to get the communications capabilities they need to meet these challenges.

While the range of services required to support recovery and reconstruction activities following natural disasters are supported by multiple satellite communications systems, handheld satellite services, which today are available in North America only from LEO satellite systems, have proven themselves to be indispensable during the search and rescue phase of activities which occurs immediately following each disaster.

For emergency services users there is a need to take steps now to best ensure that they can rely on the systems they currently use, including the systems capable of providing handheld satellite communications service. The following chart provides an overview of these alternatives, and the rest of this paper discusses each system in more detail.

	Handheld Service - Highly Portable/Low Cost	Voice Service	Data Service	Nearterm System Continuity	Independence from Terrestrial	Interoperability	Global Coverage	Nearterm System Funding	Next Generation System Definition	Established Distribution & Support System	Asset Tracking Optimized
Globalstar	●	○	●	○	○	○	○	○	●	●	●
Iridium	●	●	●	●	●	●	●	●	○	●	●
MSV	○	○	●	○	○	●	○	○	●	○	○
Inmarsat	○	●	●	●	○	●	○	●	●	●	○

Key: ● = optimal; ○ = partial; ○ = limited or not available



WHAT ARE THE PROMISES?

It has been ten years since the mobile satellite industry expanded dramatically beyond its traditional core with the launch of service on a series of LEO systems which, as noted above, for the first time made handheld satellite service available. With their lightweight and handheld satellite phones, LEO systems such as Iridium and Globalstar represented a breakthrough for the satellite services industry. Satellite communications gained dimensions of mobility and portability previously unimaginable.

There are now four MSS operators, only two of which are LEO systems with handheld service, currently providing voice and data service to North America, with at least one new operator planning to introduce service by 2010. But for the emergency communications users the basic questions are: what can I get now, and what will I get next year or the year after?

To answer those questions, the following table depicts the basic services offered and currently available from each of the providers, as well as a snapshot of their planned next generation expansion capabilities.

System	Service Types	Services Currently Available in North America	Terminal Types in North America	Next Generation Services Planned
Globalstar	Voice, Data	Voice service limited due to satellite anomalies; sporadic although predictable outages Data services fully available	Handheld	Up to 256 kbps from the handset; up to 1 Mbps downlink to users
Iridium	Voice, Data	Voice and data services fully available	Handheld	Up to 64 kbps for handheld; up to 128 kbps for mobile broadband; up to 1 Mbps for mobile high speed service
MSV	Voice, Data	Voice and data service fully available	Mobile, hand-portable	Voice, data, multimedia integrated with terrestrial via ATC
Inmarsat	Voice, high-speed data	Voice and data services fully available	Mobile, portable	Circuit-switched up to 64kbps ISDN; packet-switched up to 492 kbps

WHAT ARE THE CHALLENGES?

As indicated above, all of these systems are at some stage in the process of building next generation satellites - Inmarsat has almost completed the deployment of its I-4 series, Globalstar, and MSV have satellites under construction, and Iridium is getting ready to let a contract for its second generation. While the expanded capabilities shown above are attractive, looking a bit more deeply at the planned enhancements of each operator, it is clear that, before those capabilities are deployed significant challenges will need to be overcome. These challenges include a range of technical, market, financing and regulatory issues.

For some systems the next 2-3 years will be critical as they must successfully finance, launch and deploy new constellations of satellites to maintain or commence service. All of the companies are taking steps to

develop partnerships across these areas. Financial partnerships include both individual company programs conducted by Globalstar and Iridium as well as cross-company investments by private equity firms such as Harbinger Capital, who are invested in Inmarsat, MSV and TerreStar.

There are significant financial challenges to be met by many of these companies to build or sustain business over the next five years. Exceptions are Inmarsat, which has a solid, long-established financial position, and to a somewhat lesser degree Iridium, which has both a significant anchor tenant in the US Government and a consistently growing revenue base on satellites that do not need near-term replacement. All of the others need to finance, construct and launch new satellites within the next 2-3 years while sustaining and growing business on increasingly limited satellite assets.

On the distribution side partnerships are evolving to better serve customers and ensure access to equipment as well as services as and when needed. Finally, on the regulatory front, all companies are working continuously with the FCC to have a regulatory landscape which provides a positive future environment for the user.

Within this general framework, however, each system has its own challenges, some more immediate than others, as summarized in the following table, and discussed in more detail below.

System	Technology	Partnerships and Financing	Regulatory
Globalstar	Constellation needs immediate replacement - 40 launches planned starting 2009. Associated ATC design and deployment uncertain	ATC/terrestrial partner needed. Financing still needed to support current satellite construction and ensure service beyond 2009	ATC licenses now in place from FCC for full spectrum
Iridium	Current 66 satellite system appears fine until 2013. NEXT generation technologies still in definition with risks of construction and launch.	New financing currently in process, along with pursuit of government and other "rideshare" partners to support NEXT plans	No specific issues at present
MSV	Currently one GEO satellite. New technologies on two satellites planned for launch 2009/2010 complemented by ATC. ATC design and deployment uncertain.	ATC/terrestrial partner needed. Financing still needed to support current satellite construction and ensure future service continuity.	Spectrum-sharing agreement with Inmarsat facilitates growth
Inmarsat	10 GEO satellites now on orbit. Last I-4 launch delayed because of Proton failure and remains a risk. New dual-mode satellite and GSM phone launched mid-2007 in the Middle East, Africa and Asia.	Solid ongoing revenues and investors. ACeS partnership for dual-mode phones. AlphaSat program for advanced services in development with European Space Agency (ESA).	Spectrum-sharing agreement with MSV facilitates growth
TerreStar	New technologies on two satellites planned for launch 2009/2010 - original dates 2007/8. ATC design and deployment uncertain.	Financing still needed to support initial satellite construction. Management and staff turnover apparently tied to funding.	Recent spectrum expansion via agreements with EchoStar, CCTV Wireless and Harbinger Capital

Globalstar, one of only two companies providing handheld service in North America, is experiencing satellite anomalies which present perhaps the most visible and immediate risks, and the company has confirmed in filings with the FCC that there are times of the day when its coverage for voice services falls short of the level expected under the Commission's rules.¹ What this means is that phone service on the Globalstar system is not always available. In reporting on this situation in November 2007, industry publication *Satellite Finance* stated that: "While its low cost simplex products for asset tracking has continued to attract demand, subscriber numbers for its two-way voice and data services have flattened since the degradation of services began and much of the company's plans are reliant on its next generation

¹ Globalstar filing with the FCC January 4, 2008 FCC File No. SAT-STA-20070713-0098

system, the first satellites of which are due to go up in mid-2009. The practical deployment of a potential ATC network would also obviously rely on the second generation system being in place, which is not likely until late 2010."² Potentially as problematic as the immediate technical concerns presented by this situation are the longer-term implications for the financial health of the business.

Iridium, the only company other than Globalstar providing portable handheld satellite services, operates its first generation constellation which has outlasted initial design expectations, limiting near-term risks to the maintenance of system and service availability. While multiple studies commissioned by the company have indicated the satellites currently on-orbit should continue to provide full service until a replacement constellation is launched starting in 2013, longer-term risks include the continued health of this extended-life fleet, as well as the construction and launch of future satellites. The company is in the process of designing their NEXT system not only as a replacement, but to provide improved capabilities, and is beginning the process of its financing. While this presents challenges, the company's recent growth rates and the time frame in which they need to raise the money enhance the prospects for meeting these challenges.

With respect to Inmarsat, the most immediate risks are the ability to achieve global BGAN service, which is dependent on the launch of the third I-4 satellite, a launch that is now not expected until late 2008 due to launch vehicle delays. The gap in BGAN coverage is in the Pacific region. While the company has introduced a new dual-mode satellite and GSM hand-held phone in mid-2007, targeting the customers and contracts of Iridium and Globalstar, this new capability, a result of Inmarsat's relationship with ACeS starting in Asia, will only be available in North America after 2010.

MSV faces the need to launch its new generation MSV-1 and MSV-2 satellites in 2010 in order to provide both its promised expanded service offerings, as well as to move into hybrid services using ATC. MSV's plans also include backwards compatibility with current customer equipment, but this requires deployment of a specially-designed network interface that will enable existing satellite communications hubs and customer terminals to operate on its next generation satellite network. All of this requires significant financing.

One new player in this period is TerreStar, not currently in operation, but with two satellites under construction and now planned for launch in 2009/2010 (originally scheduled for 2007/8). The ability of TerreStar to implement its planned all-IP, fully integrated satellite/terrestrial network within the next 3-4 years depends on the successful deployment of these satellites, as well as the subsequent implementation of an ATC network to leverage its FCC licenses. While this system will represent a sea change for MSS in the US, there are uncertainties regarding potential relationships with ICO, the newly-launched mobile video satellite operator, as well as MSV and possibly Inmarsat, but the key risks for the immediate future are to sustain financing and get satellites built and launched, risks that were highlighted by recent management changes and staff reductions.

WHAT IS THE PERCEPTION?

The challenges noted above have, not surprisingly, created a range of views within the marketplace - among investors, customers, and distribution partners - about the perceived ability of each system to meet its service/market promises, or to sustain service. These perceptions have been highlighted in reports by financial analysts and trade journalists, and as needed have been addressed by the companies themselves in regulatory filings. Based on a review of financial reports, trade publications, the general press and even

² Satellite Finance 11/21/2007

Internet blogs, while all systems receive some critical or skeptical commentary, the highest level of concerns expressed for the near-term MSS business has involved Globalstar.

As noted above, the company has been open in its regulatory filings about the degree to which its current spacecraft anomalies have limited service availability, in particular limited voice service. Beyond this the public commentary has been extensive. Notes by satellite industry trade publication *Satellite Today* from the recent NAB conference even started with the inflammatory headline “Is Globalstar Rearranging The Deck Chairs?”³ and continued to discuss concerns among conference attendees with the company’s ability to sustain voice service availability through the next 12-18 months pending launch of the new constellation.

There have not been any similar concerns expressed with the ability of the other operational systems - Inmarsat, Iridium, and MSV - to provide service this hurricane/wildfire season or next. Questions do continue to be raised for the longer term about the ability of the latter two to finance and launch capacity needed by 2012-2014.

WHAT ARE THE NEXT STEPS?

For organizations gearing up to face the challenges of disaster response and emergency communications, the good news is that MSS systems offer a wide range of solid choices for both voice and data services this year. That being said, the options are reduced from last year, and many of the promised new capabilities are on hold, awaiting satellites, partners and money.

First responders and others with a genuine potential need for such services thus need to carefully assess whether the specific equipment they own and the associated services will be available when needed.

Candid, early discussions with service providers are the best way to determine whether the solutions procured over the past 2-3 years will be the best options for the next 2-3 years. Emergency managers need to review the equipment they have on hand as well as the service agreements associated with that equipment, and contact their service providers to verify the current system status. All of the MSS system operators reviewed in this paper are ready and willing to have those discussions, to ensure that first responders are effectively equipped to communicate as and when needed.

³ *Satellite Today* Blog Posted: April 17, 2007 by Jason Bates Filed under: NAB 2007 Permalink