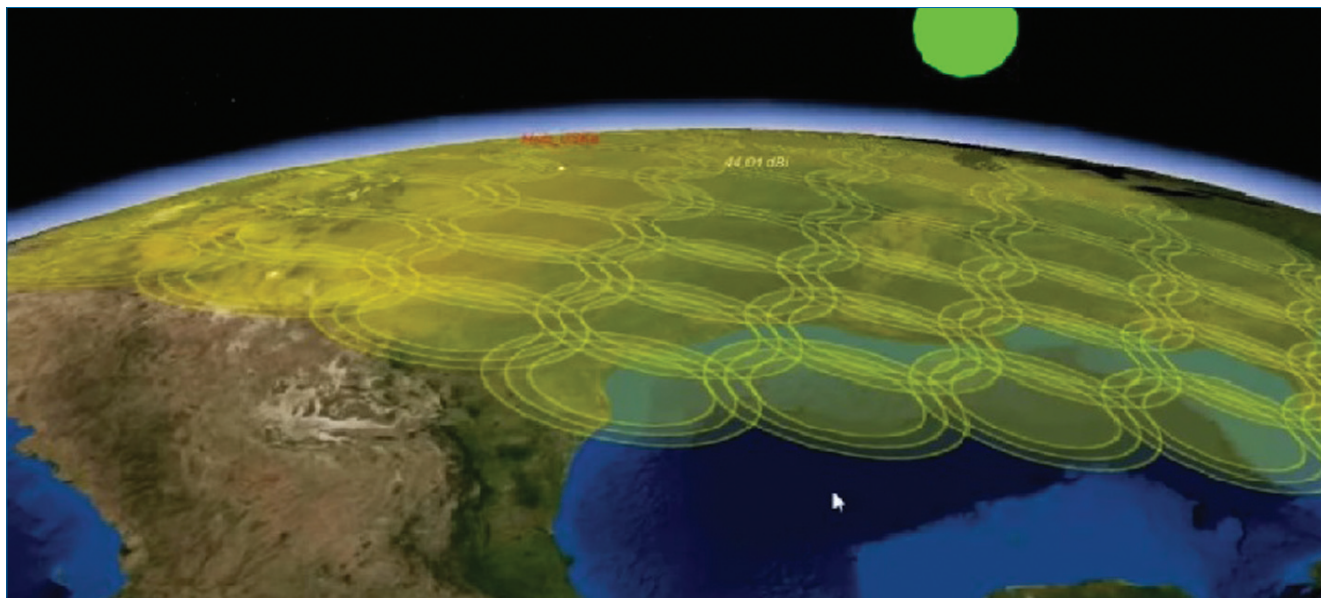




Congestion also looks set to increase with the launch of vast low Earth orbit (LEO) constellations. Photo courtesy of Integrasys ●●●

The impact of LEO and HTS on service quality

High throughput satellites (HTS) and low Earth orbit (LEO) satellites are set to change the face of the space-based communications sector forever. However, these new innovations do not come without their challenges, as outlined by Alvaro Sanchez, CEO at Integrasys.

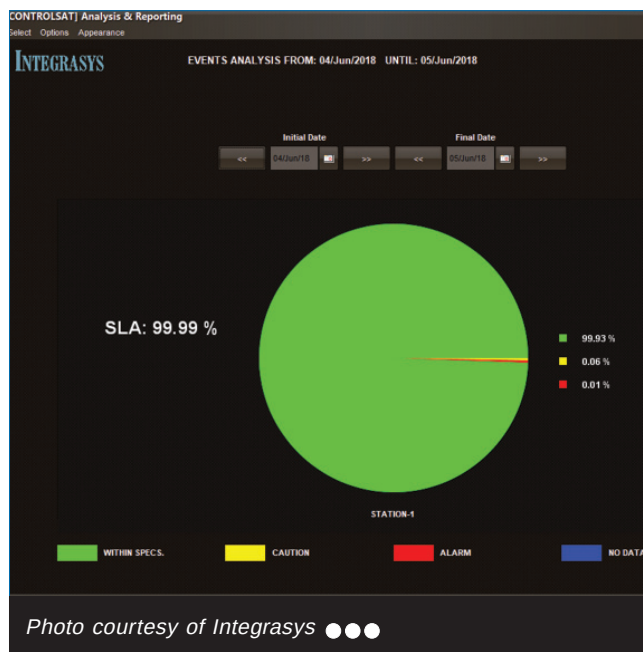
When it comes to military satcoms, accuracy and reliability is key. Interference in military X-band has been kept to a minimum, thanks in part to our great work with multiple defence organizations, but in order to meet growing capacity demands, military users are increasing their use of commercial bands. At the same time, with high throughput satellites (HTS) making it easier to deliver more connectivity at a more affordable cost, there are more services in space than ever. This congestion also looks set to increase with the launch of vast low Earth orbit (LEO) constellations on the horizon, which looks promising for milsatcom users.

More satellites in space and more users on the ground inevitably results in a bigger chance of errors, especially in these highly complex constellations. If both military and commercial users are to protect vital services, they must ensure correct installation of terminals and consistently accurate operations. Flat panel antennas in that regard becomes absolutely critical.

The HTS opportunity

Military users naturally place higher demands on their satellite services than commercial users. Tight regulations and training have, however, meant that milsatcoms have remained relatively free from many of the interference issues faced in commercial satcoms. Having said this, with increased usage of HTS in the less-tightly regulated commercial Ka and Ku-bands, the

likelihood of interference and service degradation in milsatcoms has increased. Furthermore, soldiers are



commonly under-trained in HTS and other new technologies, so they now require simpler tools to do the job.

HTS does mean that operators are able to deliver more connectivity at a more affordable cost, and of course that's a good thing. HTS is much more efficient, can carry more services and is cheaper to manufacture. Many remote, underprivileged communities are being connected to the wider world, in cases where without HTS, they simply wouldn't have been.

The military operating in remote areas also benefit in these scenarios, but HTS carries its own set of challenges. The satellites themselves are more susceptible to bad weather for one, and rain fade can be a problem. The general accessibility and affordability of HTS has also opened up the satellite space to a number of troops that simply don't have the same level of knowledge and understanding as traditional satellite engineers.

When there are more services competing for space, there is inevitably a greater chance of someone pointing to the wrong polarization or making other errors, and saturating BUCS, beams or even entire satellites.

The LEO challenges

The satellite sector has further challenges ahead in the form of LEO constellations, which look set to intensify congestion in space. Although infinitely positive from the point of view of cost-efficiencies and added bandwidth provision, there are concerns surrounding LEO.

For military users looking to supplement X-band with commercial bands and take advantage of the opportunities presented by HTS and LEO, it is all a bit of a headache. For every user, whether it's in the commercial sector or otherwise, to fully benefit from HTS and LEO, errors must be kept to a minimum. That way, the true cost efficiencies can be enjoyed with no need to expend resources or send engineers on-site to resolve issues.

Putting tools in place

For both LEO and HTS, correct antenna pointing is absolutely essential. If this can be done in an automated fashion, then any element of human error is removed, particularly for reconnecting to LEO satellites. When it comes to monitoring, it is even better if this can be done remotely from the Network Operating Center (NOC), especially for services like comms-on-the-move (COTM), which we know to be particularly challenging in the military environment. Our own Satmotion HTS solution also supports multiple beams, so in congested scenarios where there are too many users within a particular beam, the service can be hopped to another beam or Satmotion can instigate traffic sharing. In addition, our new API allows a greater pointing in LEO and MEOs of the flat panel antennas in the market.

At Integrasys, we have been working to make the right tools available for the job in LEO. Today, we have innovated a monitoring system that ensures 99.99 percent availability compliance, monitoring any LEO constellation and users, 24/7, in a dynamic and flexible way. Additional automation of many of the installation and operating tasks ensures operations are constantly monitored and error-free.

What is clear is that innovations and technologies, although promising in terms of maintaining the demand for satellite, could cause us problems if we don't put the necessary tools in place now. I'm excited to see where LEO will take us, but like most people in the industry, am concerned that many users and the new

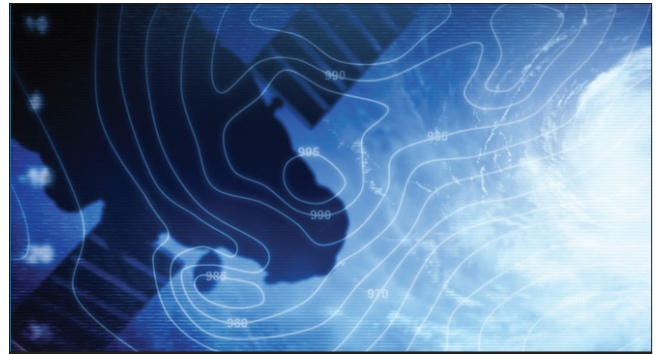


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generation of operators aren't prepared for the technical challenges ahead. I hope that both military and commercial users will begin to invest in the right tools and equipment, so we can safeguard the reliability of satellite communications and make the most of the opportunities presented by LEO and HTS. ✨

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