Maritime communications, TV ecosystems and the digital divide

Spain’s satellite operator HISPASAT has more than 25 years of experience serving the audiovisual, companies/government and operator markets around the world via its seven-satellite fleet. Each year, it holds a series of Innovation Days to meet with partners, customers and industry professionals to discuss the latest trends and developments in the satellite sector. In 2016, Innovation Days were held in six cities around the world, where topics like TV ecosystems, maritime communications and the digital divide were discussed by key industry personnel. Amy Saunders attended the HISPASAT Innovation Day 2016 in London to find out more.

**The fourth stop of** HISPASAT’s Innovation Days 2016 began with a brief welcome from Chief Commercial Officer Igancio Sanchis at Hotel Café Royal in London. He was followed by HISPASAT’s Head of Business José Antonio Guerra, who provided an overview of HISPASAT’s operations. HISPASAT was founded in Spain in 1989, and in 1992 it launched HISPASAT 1A, its first satellite. Today, the company has seven satellites in six orbital positions, as well as a further three satellites due for launch: HISPASAT 36W-1 in 2016, HISPASAT 30W-6 in 2017 and Amazonas 5 in 2017. HISPASAT is highly active in America, Spain and Portugal, and is developing its position in Europe, the Middle East and North Africa.

HISPASAT serves three vertical markets:
- **Audiovisual:** DTH, UHD, distribution/contribution, occasional use, multicast TV.
- **Companies/government:** Data multicast, UAV, telemarkocmd networks.
- **Operators:** Backbone connections, cellular service, Internet access, broadband mobile services, corporate and residential broadband services, VoIP and back-up satellite.

In 2015, HISPASAT achieved revenues of Euro219.6m. According to Guerra, the company continues to forge ahead with new office openings, most recently in Colombia, and innovative new partnerships.

**Providing internet access to high-speed trains**

The first presentation of the day was given by Indra’s Business Development Manager Carlos García Eiriz and Aicox’s Vice President of Sales Salvador Gomis, who discussed the provision of Internet access to high-speed AVE trains in Spain. Following a four-month pilot study, HISPASAT, Indra and Aicox worked in conjunction to deploy the solution on 89 trains on the AVE network.

Gomis identified the key challenges as the 350km/hr train speeds, high interference levels and constant interruptions of the modems when...
travelling through tunnels. Indra, which started providing Ka-band connectivity solutions to trains in 2009, has long held the belief that satellite is the answer to poor or no connectivity on trains. “What we have realised in the past is that there is no solution to give all passengers 100 percent connectivity... The only solution that covers 100 percent of trips is satellite,” said Eiriz.

A unique hybrid solution was developed. It features an aerodynamic gyro-stabilised antenna attached to the train's chassis, small enough to fit within the 40cm gap between the train roof and the tunnel base, which enabled communication with HISPASAT’s satellites in the 30°W and 61°W positions. To overcome connection loss through tunnels, an antenna was installed at the station in front of each tunnel, allowing bandwidth to be distributed by Wi-Fi. The new connectivity allows audiovisual services including live TV, a film library and virtual newsstand, as well as Wi-Fi access, to 400 customers on each train. It also provides critical connectivity between on-board staff and the AVE control centre, allowing information on tickets, timetables and incidents to be shared without delay.

**Challenges in maritime communications**

Newtec’s Product Manager Bart Van Poucke, BT’s Global Satellite Product Lead Renato Goodfellow and iDirect's Systems Engineering Manager (Europe) Francis Prout debated the challenges in satellite-based maritime communications. COMSYS’ Susan Bull, moderator of the session, asked Van Poucke and Prout to explain how their latest products would improve upon existing maritime communications technology.

Newtec’s Dialog Platform features cross-dimensional multiple-access (Mx-DMA) technology that incorporates the best parts of MF-TDMA and SCPC, enabling adjustments in frequency plan, symbol rate, modulation, coding and power in real-time for every terminal in the satellite network based on return traffic demand, the network QoS management and channel conditions. Van Poucke emphasised that the high efficiency (Mx-DMA typically results in a doubling of the transponder throughput using the same bandwidth, or alternatively reducing the required capacity by 50 percent) can be of great benefit to the maritime sector, particularly cruise ships, where connectivity speeds are very important.

“What makes it a good fit is that you can share capacity. When you have a traditional SCPC set-up, you have a single carrier dedicated to one purpose all the time, even when it’s not being used,” said Van Poucke. Explaining how the Dialog Platform would be beneficial to the maritime industry going forward, he added, “When you look at all of the satellite capacity coming online, it takes a lot of intelligence to select the right beam. It’s not just about availability; it's also about cost. Some beams might be more expensive than others, and some might be overloaded. With the Dialog Platform, we give the network operator the option to operate using his own business logic.”

iDirect offers the Evolution and Velocity platforms, both IP-based communications systems that provide broadband connectivity for fixed and mobile applications. The product lines consist of universal hub and network management systems comprising line cards, software and dedicated and dual-mode remotes. Following the recent upgrade of the Evolution platform to enable Layer 2 over Satellite (L2oS), the platform is being developed still further to enhance its remote performance, RF efficiencies and scalability. “We’ve chosen to build upon the success of our Evolution platform with our partnership with Inmarsat. It was always designed for very large-scale HTS networks, so we’ve built upon our beam switching capabilities and our MSS support.”

According to Bull, there are now more than 20,000 vessels with VSATs installed, and the market continues to grow at double digit rates following a small slow-down in 2015. Adoption rates are picking up in 2016, although growth is uneven. Oil and gas has taken a big hit in the last 12 months, and operators have reported a massive reduction in the number of vessels they serve. However, there’s been an increased adoption of maritime service by container ships, tankers and freighters. Van Poucke said that one of the reasons for this growth was the protection and monitoring of cargo and efficiency improvements, while Goodfellow reported that his customers have said that connectivity is an important factor in crew welfare and retention.

Flat panel antennas are making big waves in the market. Prout said that one of the selling points of flat panel antennas is the aesthetics: “That they don’t need radomes is a big attraction in terms of aerodynamics. The fact that you can just add more panels to increase downlink speeds is another benefit.” Goodfellow agreed that flat panel antennas will have a big place in the market, and added that their ability to switch between beams almost instantaneously and their electronic steering provided great benefits.

Concerns that maritime satellite communications may become a commodity, in addition to facing threats from terrestrial networks, were raised. “Eventually commoditisation will occur... There are also projects off the coast of Portugal and Spain where ideas are being tested, like fishing boats being used as wireless relay sites to extend wireless networks further out to sea,” said Goodfellow. Bull agreed that terrestrial technologies would compete on coastal areas, but doubted that satellite connectivity at sea would truly be threatened. Prout asserted that although commoditisation was likely, this simply meant that margins would be reduced and that providers would have to consider how to add value to their services. He added that as prices are driven down, new markets would open up due to the improved economics: “I can see more and more vessels being connected via satellite.”

**TV ecosystems: more quality, more flexibility and more screens**

Nagravision’s Senior Marketing Manager Christopher Schouten, Arqiva’s Head of Strategy (Satellite and Media) Nick Moreno, Informa Telecom’s Editor (Digital TV Europe) Stuart Thomson, and Dolby’s Director (Systems Architecture & Broadcast) Prinyar Boon discussed the future of TV ecosystems with HISPASAT’s Estel Fernández.

The TV market has changed rapidly in recent years, with more viewers wanting to pick and choose what and how they watch. The multiscreen phenomenon is a key part of that. The panel agreed that, while the traditional family TV set is not being replaced, additional devices are definitely coming...
into play. Boon said that it’s down to the social aspect, and Fernández agreed, commenting: “It seems like young people are not interested in watching TV, but with dual devices, they can interact with their friends while watching TV on the family screen.” Meanwhile, Thomson asserted that it’s part of the evolution of technology use. “Most of the research on the dual screen phenomenon, especially when it comes to millennials, is about using a personal device while there is a family device in the room. The TV practically becomes background noise. What you have to keep in mind is that, smart phones, netbooks and tablets provide a much more advanced user interface, and a much easier way to find desirable content than TV services today,” said Thomson.

There’s still many years of linear broadcast TV left though, with the main channels delivered most effectively via satellite, alleviating the increasing congestion on the Internet as the percentage of video bandwidth usage increases. However, the panel opined that there will be a shrinking number of linear TV channels as poor content is squeezed out of the market. “In the last 12 months, we’ve seen big changes in the contracts we’re bidding for. The one thing all broadcasters want now is downward flexibility, of 10-20 percent, and, in one case, 50 percent. That’s a real challenge for us as a business,” said one of the panellists. The fight in the years to come will be for content quality rather than quantity.

The issue of picture quality was also raised. Fernández said that the conversion from SD to HD has been a complete market success. “People adapt their expectations to whatever is available to them. We’ve all become used to HD, so when we watch something in SD now, we don’t like it. It’s situational though, people don’t expect top quality video when they’re watching on their devices,” commented Thomson. The world’s largest viewing figures are for live sports events like the World Cup or the Olympics, and broadcast systems, not the Internet, will remain the best means of distribution. For these events, image quality is extremely important, and it’s driving the UHDTV market. However, if it’s a choice between quality and access, access will win every time.
"I think it’s a shame that the only way you can get in front of digital policy makers is if you’re talking about 5G," said Holla. "If you want to talk about the digital divide, or the fact that some people only have access to very low-speed broadband, nobody is interested." It’s a double-edged sword though, as policy makers need to be ambitious to bring technologies like 5G into realisation.

5G is proving to be a big opportunity for terrestrial operators, mobile operators predominantly, to cut out satellite by talking about driverless cars and sensors that require zero latency. Research shows that the most promising part of the connected car business model is the safety features, but users aren’t going to pay extra for those services if they don’t work in rural areas. That makes satellite necessarily a part of the solution. Holla said that there needs to be a hybrid terrestrial-satellite solution for connected cars and other similar projects to provide complete coverage.

At the HISPASAT Innovation Day 2016 London, Amy Saunders spoke with Newtec’s Product Manager Bart Van Poucke to find out more about Newtec’s take on recent maritime communications developments.

**Question: What is the biggest challenge faced today by the maritime industry?**

**Bart Van Poucke:** The biggest challenge facing mobile VSAT operators in the maritime market is the issue of scale. The advent of high throughput satellites (HTS) and the consolidation of the industry as a whole mean that networks are getting larger and bandwidth demand is growing exponentially. Although early VSAT platforms introduced important innovations such as uplink power control, dynamic bandwidth allocation and beam switching, that generation was never designed for the scale required in modern VSAT communications. The problem is that most of the features on first generation platforms operated independently, making the results unpredictable and difficult to manage when working at scale. In order to deal with the ever-increasing demand, a solution that combines these features in a way that is efficient, flexible and scalable is required.

**Question: How will the ever-increasing amount of HTS capacity affect your customers?**

**Bart Van Poucke:** The powerful spot beams created by HTS are one of the main catalysts for the requirement of new, modern VSAT platforms, creating demand for more robust equipment and advanced transmission standards. The increase in capacity provided by HTS, and the lower costs, opens satellite connectivity to new industries and markets. Maritime is just one area that will see real benefit from the deployment of these satellites, particularly as the requirements for the industry move away from basic Internet connectivity to vessels and rigs towards more bandwidth heavy applications such as Voice over IP (VoIP) and video streaming.

Although it is revolutionizing the satellite industry, the increase in HTS is creating new challenges for the industry. Having a large number of small beams means that beam switching logic must become smarter and multidimensional to allow network operators the flexibility to deal with factors such as cost, weather, load balance and restrictions from local regulations. As such, VSAT platforms and modem hardware must become more powerful and future-proof, supporting higher data rates and extending upgrade cycles. Satellite networks should also be more transparent, integrating seamlessly with terrestrial networks. In order to sustain the next wave of growth, beam switching schemes will need to be more efficient and scalable.

**Question: What’s on the horizon for Newtec in the maritime segment?**

**Bart Van Poucke:** We have always been acutely aware of the price pressure facing maritime network operators in an ever-evolving industry, and we have consistently focused our energies on pushing the limits of spectral efficiency because of this. Innovative new waveforms such as DVB-S2X and our unique Mx-DMA® return technology means that our recently-launched MDM5000 satellite modem can reduce capacity costs by up to 50 percent, but we don’t see ourselves stopping there.

Our latest release of Newtec Dialog (1.3) will include an advanced beam switching engine, which will provide unprecedented control over beam switching logic, and a rich set of APIs will facilitate network load balance, least cost routing and regulatory compliance.

We’re also working with Quantis on its OpenSea offering, allowing the company’s maritime customers to handle the ever-increasing demand for data that comes from bandwidth-hungry services that are now accessed through smartphones and mobile devices. The Newtec Dialog platform means they receive double the throughput in the same amount of bandwidth, so the service remains efficient and cost-effective while still providing the desired user experience for the passengers and crew.