Hadi Nazari, Group CEO at NorthTelecom explains the company’s vision.

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The only thing that is constant in the world is change

We’ve come so far in terms of computing technology that the world today is unrecognisable from that of 50 years ago. The technological revolution has changed millions of lives for the better with tools like Smart phones, tablets and laptops, each enabling so many new opportunities. With these tools, we can run online businesses, shop for groceries from the comfort of our own home, complete further education from remote locations, and stay in touch with loved ones, in real-time, from anywhere on the planet.

In my view, there have been two key enablers that have made all this possible. The first is the Internet; connecting anyone, anywhere, we have truly become a global community of people able to buy, sell, and interact, regardless of position or location. The second is automated production; with it, manufacturing costs have plummeted, making advanced technologies such as those Smart phones and computers that can connect the world, affordable for the majority.

In June, I visited OneWeb Satellites at Airbus’ manufacturing facility in Toulouse. OneWeb has a vision of creating a fleet of 900 satellites in low Earth orbit (LEO) that will deliver high-speed Internet access to the entire world by 2020. The company aims to connect the under and un-connected, delivering services to schools, governments and communities, and effectively solving the digital divide.

To achieve its goals, OneWeb has taken the next logical step in satellite manufacturing, making a significant breakthrough in the development of small satellite constellations. During my visit, OneWeb inaugurated its first assembly line for end-to-end validation, testing and integration of the 900 satellites required for the OneWeb LEO constellation. The assembly line will break all previous records, manufacturing satellites at a rate of one per day. Once OneWeb’s two other assembly lines in Florida are completed, the company will be able to produce three satellites per day, bringing the production time of its satellite fleet down to around a year.

Traditional communications satellites take somewhere in the region of one year each to integrate and test, making OneWeb’s achievement a massive breakthrough for the industry as a whole. With strict controls and an extremely high level of automation demonstrated during the factory tour in June, standards will be kept tight; ensuring the OneWeb satellites will be produced to the highest specifications. Certainly, there have been a lot of murmurs and scuttlebutt about how the satellite constellations proposed by various companies were going to be filled in a timely manner - now, OneWeb has shown how it will be done.

It’s said that the only thing that is constant in the world is change, and that’s true for the satellite industry as well as everything else. Who knows where we’ll be in another 50 years.

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Speedcast International awarded fully-managed communications contract for Fred. Olsen Cruise Lines

Speedcast International Limited has been selected by UK-based Fred. Olsen Cruise Lines to provide end-to-end communication services for voice and data on board its fleet of four cruise ships.

Speedcast will leverage satellite Very Small Aperture Terminals (VSAT) and land-based 4G/LTE connectivity to deliver communications for Fred. Olsen guests and crew on board its fleet of four cruise ships Balmoral, Braemar, Boudicca and Black Watch - wherever they are in the world. The integration of both satellite and land-based infrastructure allows Fred. Olsen to optimise the use of its ships’ networks.

The Speedcast multi-band managed communications platform will be installed on each of Fred. Olsen’s ships, monitoring for and adopting the ‘best fit’ satellite, wireless or terrestrial network. Speedcast’s Intelligent Communications Director technology will provide seamless, automatic switching between the different networks and technologies to ensure robust connectivity at all times.

Utilising Speedcast’s global satellite capacity infrastructure, the network will also provide reliable connectivity between Fred. Olsen’s offices and its fleet, sailing all over the globe.

“We are keen to benefit from Speedcast’s expertise in providing industry-leading connectivity services to enhance our onboard guest experience, providing high-bandwidth availability for each of our four cruise ships,” says Damon Impett, Head of IT for Fred. Olsen UK Group.

“Having access to a truly global communications network, capable of ensuring that our fleet will be always connected wherever we sail, was the most compelling factor when making this important decision, and Speedcast certainly delivers that. This also allows us to operate more efficiently between ships and onshore offices, with seamless connectivity from anywhere.”

“We are excited to add Fred. Olsen as a new global cruise customer,” says PJ Beylier, CEO of Speedcast.

“Our core competencies of supplying reliable communication and IT solutions to highly-mobile ships sailing in remote areas fits Fred. Olsen’s connectivity needs and company infrastructure very well. We are proud to have the opportunity to assist them with their goal of providing a top-notch guest and crew experience on board their cruise ships, through a combination of innovative technology and a high level of customer service.”

The Speedcast solution will include 24x7x365 support from its customer service centres, located on five continents, as well as robust monitoring tools to manage Fred. Olsen’s network proactively, ensuring the highest availability and most efficient use of satellite and 4G/LTE connectivity.

exactEarth’s small vessel tracking service is now supported by the VMS Track-Pro from Weatherdock AG

exactEarth has announced that its exactTrax™ small vessel monitoring technology is now incorporated into the VMS Track-Pro, the newest Class B AIS transponder from Weatherdock AG of Nuremberg, Germany.

VMS Track-Pro is the world’s first single-bracket, battery powered and purpose-built AIS-based tracking solution, which makes it a secure, easy-to-use, and cost-effective solution for tracking fishing vessels and other small crafts. More than 15 years of research and development have gone into the production of VMS Track-Pro, which included extensive input and feedback from fisherfolk, as well as detailed analysis of homeland security requirements. The resulting data services, which combine the Class B AIS transponder with CML microprocessors and exactTrax technology, provide the ability to securely monitor the millions of artisanal and small-scale commercial fishing boats and small commercial work boats currently operating around the world.

This ability to monitor and track vessels equipped with exactTrax-enabled transceivers supports safety of life at sea and delivers an unrivalled picture into the world’s global maritime activity. Monitoring these vessels can also provide critical intelligence into a variety of marine applications such as fisheries protection, environmental preservation, and maritime surveillance/security through improved ‘dark’ target analysis.

“We recently announced that our exactTrax service is now available for integration with all AIS transceiver manufacturers and, as an internationally recognized supplier of high-quality AIS hardware, we couldn’t be more pleased to add Weatherdock to our growing list of suppliers,” said Peter Mabson, CEO of exactEarth.

“Expanding our list of partners means that we can now reach even more potential users worldwide and offer customers real choice in their platform options.”

BS Broadcast establishes business in Middle East to cater to region’s untapped market for used broadcast and satellite equipment

Backed by Broadcast Systems Arabia, one of the region’s leading broadcast system integration companies, BS Broadcast has established itself as the first company in the Middle East to deal in the buying and selling of broadcast and satellite equipment.

BS Broadcast has established itself as the first company in the Middle East to deal in the buying and selling of broadcast and satellite equipment.

“Expanding our list of partners means that we can now reach even more potential users worldwide and offer customers real choice in their platform options.”

www.satellite-evolution.com | July/August 2017
News Review & Analysis

Thuraya poised for government collaborations, post KSA roadshows

Thuraya Telecommunications Company recently held meetings with senior-level officials and government system integrators in the Kingdom of Saudi Arabia (KSA) to present its latest product portfolio and explore possibilities for collaborative ventures. The roadshow that took place in July and included visits to Jeddah, Riyadh and Damam, was exclusively developed in line with increasing KSA’s public sector interests. Thuraya’s national service partner, Farhan Commercial Company played a pivotal role in enabling meetings with the country’s commanding officers and decision makers.

From formal introductions with new potential partners to sit-downs with long term clients, each meeting maintained a live demo component: Thuraya’s suite of land voice and data products was on display and customers were allowed to conduct testing on the equipment of their interest.

Many meetings were held with specialized solution integrators who work with the government to deliver customized applications for military and government vehicles.

Thuraya also held discussions to determine the scope for developing specific M2M solutions such as seismic sensors for the KSA market.

Thuraya Telecommunications

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Do panel interviews help you hire the best candidate?

As a CEO or business leader, adding the right talent to your business through the most efficient means is a top priority. Panel interviews are an efficient use of time since all members of the hiring jury are interacting with the candidate at once. However, interviewing requires both an employer as well as a candidate in order to successfully complete the two sides of interviewing.

Since the most complex and complicated part of every business is the people who work there, how much thought is given to the candidate when using the panel interview format? The internet offers pages and pages of preparation tips for candidates. Hiring great talent requires attracting great talent. Does the panel format attract the right talent to your business?

We frequently see panel formats on TV when individuals are being interviewed by panel members of our government and in reality shows.

Let's explore the key issues to see how panel interviewing can help your business hire great candidates.

Panel interviews from the business’ view

- Multiple people all interviewing the candidate at once;
- Efficient use of time;
- Effective multiple interactions;
- Observers can study responses such as body language and tone; and
- Really tough interview questions can be asked by the group, providing group insight based upon the candidates’ response.

Panel interviews from the candidate’s view

- Candidates often describe their feelings leading up to a panel interview as being nervous, stressed out and uncomfortable.
- There is a vast amount of panel interview preparation available to candidates. For example, here is an article describing the panel interview as, “The Firing Squad”. In this article, ambush is used to describe the panel interview.
- With the panel format, candidates might be spending more time rehearsing for the predicted interview questions than spending time researching your company and trying to best understand how they can solve the business challenge that would help your business.
- From the candidate’s perspective, your candidate may even view the panel as if the candidate is preparing for battle. Ask yourself, is your business hiring for cage match or mixed martial arts competitors?

Let's not lose sight of the purpose of best practice hiring. It is a business event where your business needs critical talent to solve a business challenge while also fitting the culture of your company.

- Remember, being a candidate is difficult enough without being put into battle mode.

How to hire great candidates using panel interviews

- The panel interview approach will not lead your business down the road of hiring great candidates;
- Your business is reducing the chances for successfully hiring great candidates with the use of panel interviews; and
- The firing squad feeling that candidates experience suggest to the candidate that your business has little concern for a true candidate interaction.

The panel interview model delivers candidates who have fully rehearsed answering the predictable questions instead of candidates who are focused on solving your business challenge.

What is the best approach?

- Take the time to have qualified candidates meet individually with each member of the hiring jury. Yes, this will be perceived as taking more time. However, if each member of the hiring jury is spending an hour in a panel setting to meet with a candidate, then the same hour could be spent by each interviewer, only on a one-to-one. The one-to-one setting gives the candidate an opportunity to experience the company culture along with some personal interaction. Developing a personal connection for the candidate is critical in attracting and hiring top people. Once the candidate has had their initial meeting with the hiring jury, any follow-up interviews can easily be held in a group setting. At that point, I would term them as a “group meeting” instead of a panel interview.
- The best results involve the employer making the candidate relaxed and comfortable, so you can see what they will be like when they are working in your business. Candidates do not respond well to tricks or perceived intimidation. Panel interviews are intimidating to candidates.

Ask yourself if panel interviews work

- Is your business embracing the medieval style of the outdated panel interview or is your business embracing modern technology and modern efforts to hire the right talent?
- As the CEO or business leader, have you audited your company’s hiring process and do you ask interviewing candidates to tell you one thing your company could do to improve the candidate’s experience?
- Is your company’s hiring focus about simply hiring a candidate or hiring the right candidate.

Bert Sadler is the President of Boxwood Strategies and is a thought-leader for best practices recruiting, performance-based compensation and the shift in the changing paradigm toward acquiring critical senior level talent.

Bert can be reached at BertSadler@BoxwoodSearch.com and at BoxwoodSearch.com
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LTE is only for high-speed services!

By Richard Swardh, Senior Vice President, MNO for Comtech EF Data

This second piece in my myth buster series focuses on the notion that LTE is all about high-speed. Press releases, newsletters and LinkedIn posts from the satellite industry are full of new and groundbreaking achievements in LTE top speed while using satellite as backhaul. While it is true that it is quite easy to achieve very high speed to a single user using LTE over satellite basically matching the max throughput of a satellite modem, it has no bearing on real use cases in the markets satellite typically serves. The quest among vendors in the satellite industry to outdo each other in what top speed is possible to achieve using LTE is misleading the customer base and misses the whole point of what LTE is all about. As an industry, we owe it to ourselves to try to understand what the real drivers are behind LTE over satellite and to seek the truth of what matters to Mobile Network Operators. Read on and I’ll explain why.

Long Term Evolution or LTE is the natural upgrade path to higher speed data services for mobile operators running GSM, 3G or CDMA networks. LTE is also commonly referred to as 4G LTE, which was first standardized in 2008. Its foundation is an all-IP-based flat network architecture in the Core Network and a new radio interface from the base stations (now called eNodeB) using OFDM in the downlink and FDMA in the uplink. The radio interface can operate in both Frequency Division Duplexing (FDD) and Time Division Duplexing (TDD) modes and can make use of carrier aggregation to bond together channels of different widths in different frequency bands to enable very high data throughput.

LTE Advanced

To most end users, LTE networks are synonymous with very high data rates that in some commercial networks today can provide speeds exceeding several hundred Mbps in the downlink to a single smartphone user. In the latest iteration of the standard called LTE Advanced, LTE will finally become a true 4G standard as defined by the ITU by achieving 1 Gbps of download speed. This is done by bonding together 60MHz of spectrum in different frequency bands using 256 QAM modulation and 4x4 Multiple Input/
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Spacecom’s AMOS satellite constellation, consisting of AMOS-3 & AMOS-7 co-located at 4°W and AMOS-4 at 65°E, provides high-quality broadcast and communications services across Europe, Africa, Asia and the Middle East. With AMOS-17 planned for launch to 17°E in 2019, Spacecom will further expand its reach, reinforcing its position as a leading satellite operator.
Richard Swardh is Senior Vice President, Mobile Network Operators for Comtech EF Data. In this role, he leads the market development and direction for the 2G/3G/LTE mobile backhaul market, directing long-term strategic initiatives and defining solution suites and feature sets. A mobile network backhaul veteran, Swardh’s background includes strategic and operational positions at Ericsson with business development, partnership management and strategy execution responsibilities. He holds both a Bachelor of Science degree in Mechanical Engineering and a Bachelor of Business degree in Administration and Logistics from Vaxjo University in Sweden.

Multiple Output (MIMO) antenna systems. While it will likely be another year or so before handsets supporting Gigabit speeds (called Category 16 terminal) will be available commercially from major vendors, it is astonishing what data rates LTE has managed to achieve in its still early life.

So, is LTE all about just high-speed services then? Let me challenge that myth and examine some of the reasons behind why LTE is the fastest growing wireless standard ever.

The ability to offer end users with very high data rates over LTE certainly gives a Mobile Network Operator (MNO) some marketing bragging rights. However, what really matters to an MNO’s bottom line are LTE’s various innovations that enable the cost per bit delivered to an end user to be significantly lower than what is possible with existing GSM and 3G technologies. A very efficient and interference-tolerant radio interface with flexible bandwidth channels in many frequency bands bonded together coupled with the latest modulation and coding techniques ensure the best use of the most valuable asset an MNO has, namely licensed spectrum. An all-IP flat network architecture called Evolved Packet Core delivers low latency and offers the scalability and operational efficiency needed to support data services at a lower cost per bit than within the GSM or 3G ecosystem. Most of these innovations, although many times aimed at reaching higher and higher data rates not only benefit consumers and enterprises looking for fast connections, but also ensures that an MNO can support use cases requiring low-to-medium data rate services more efficiently. Increased spectral efficiency and faster delivery of data means that more users can be supported within a given licensed spectrum. A clear example of this is a recent addition to the standard called Machine Type Communication (LTE-MTC). This is a new low data rate and long range enhancement to the LTE radio interface that allows for billions of devices to connect to the Internet using very low cost and power-efficient LTE modems that can run on two AAA batteries for more than 10 years.

LTE-MTC is designed for the Internet of Things (IoT) and enables MNOs to offer new machine to machine (M2M) services very cost efficiently while re-using existing LTE infrastructure. Interestingly for the satellite industry is that some of the upcoming LTE-MTC deployments are in very remote areas or in mobility markets (air, sea) where satellite has a strong value proposition creating another good synergy between satellite and mobile technologies.

Embracing LTE

Today, there are several examples of MNOs around the world embracing LTE over satellite for delivering data services to their subscribers more efficiently than via GSM or 3G technologies. A few of these LTE deployments are aimed at very advanced use cases achieving tens and even hundreds of Mbps to a single end user. However, most deployments are, in fact, for traditional rural deployments where an average data rate around a few Mbps to a single end user is sufficient many times over.

The primary advantage for MNOs that deploy LTE-based satellite backhaul is the ability to address new markets that may have not been previously profitable. Essentially, regardless of what data rates are supported to end users, the cost per bit delivered is more than 50 percent less than it would have been using GSM or 3G networks for a similar throughput. So, while the technical capabilities are there, LTE in the satellite backhaul use case is not only about delivering the highest possible data rate to an individual end user, but about being able to deliver data services to consumers and enterprises at a lower cost per bit enabling a better business case for the MNO. Lower cost per bit delivered to end-users is a key reason why LTE is the fastest growing wireless standard ever and why it will enjoy tremendous success together with satellite backhaul.
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NorthTelecom is a leading global satellite service provider delivering solutions to customers on land and at sea. With 12 international points of presence and seven teleport operations around the world, NorthTelecom has come a long way since its establishment in 2007. Amy Saunders met with Hadi Nazari, Group CEO at NorthTelecom, to discuss the company’s capabilities, market outlook, and plans for the future.

Question: Can you provide an overview of NorthTelecom’s capabilities and expertise?

Hadi Nazari: Simply put, NorthTelecom is a service provider, with a big focus on satellite. We are not a simple capacity trader; we implement services, delivering door-to-door solutions, and providing added value.

We started out in Dubai in 2007, with our focus mainly on the Middle East; Oman, Saudi Arabia, Iraq, Afghanistan, Qatar, Bahrain, and some countries in North Africa. In 2010, we expanded our services to the African continent, and I’m very glad that, today, we have a very good market share in Africa.

We decided to expand our business to Asia. Knowing Singapore as a business hub in Asia, we have set up an office there. More recently, we acquired ScopeTel in Malaysia, in order to better leverage NorthTelecom in Asia.

Question: In March 2017, NorthTelecom welcomed Malaysia’s telecommunications company ScopeTel into its group; this was followed in May 2017 with an announcement of new NorthTelecom facilities in Singapore. How important is the APAC region to NorthTelecom’s plans going forwards, and what role will ScopeTel play?

Hadi Nazari: There was a lot of talk in 2008-2013 that Africa was the major emerging market, but today, there are thousands of Megabytes of capacity sitting idle over the continent, and the market there is suffering due to oversupply on the one hand, and the lack of a proper ecosystem and other
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difficulties on the other hand. North Telecom was eager to find a new market with new opportunities, and in the end, we decided on Asia. We see big opportunities there, particularly in Indonesia, Malaysia, the Philippines, and the Pacific Islands.

ScopeTel has 20 years of experience in Malaysia; it was a very incumbent player for oil and gas. It is a licensed company with a good human capital and various safety certificates specifically for the oil and gas market. North Telecom fully expects to be able to leverage this business to further its activities in the oil and gas sector and in maritime, which are still emerging businesses in Asia. We’re looking very hard into how we can best leverage ScopeTel, and we expect to benefit greatly from its expertise.

**Question: The oil and gas sector has seen major disruption for several years now due to the drop in crude oil prices. Do you feel they are willing to invest given the current market?**

**Hadi Nazari:** I think we’re all very much agreed that the oil prices in the past were not realistic, when prices were US$100 and even greater per barrel. Oil prices started to fall in 2013 and continued to do so until 2016, when they finally started to stabilise. From my standpoint, oil prices right now are very realistic; they’re not going to increase a great deal anymore.

In recent years, oil and gas companies have been unsure whether they should invest in new drilling and exploration projects; they were really holding back. Now that prices have stabilised, we’re starting to see investments in new projects. Of course, there will never be a tremendous amount of investment in this segment, but there could be a reasonable amount, and I’m optimistic that North Telecom will see some of that business.

**Question: What key emerging trends do you expect to have the biggest impact on North Telecom’s business, and how will the company respond?**

**Hadi Nazari:** Over the top (OTT) could be a threat for us as an industry, of course, because we are leveraging satellite capacity to serve broadcasters and viewers. OTT is definitely competing with satellite capacity, but I’m not really looking at it from a threat standpoint for industry in general or North Telecom in particular right now. The areas that we’re working in, the Middle East and Asia, have no good terrestrial infrastructure to serve OTT, so I think that, for the next 5-6 years at least, OTT will not be a threat for us.

These new trends, things like OTT and 4K, I prefer to look at more from an opportunity standpoint than a threat. OTT and 4K both deliver an opportunity to utilise more capacity, and that’s good news for us - we can sell more satellite capacity to deliver these services, especially with 4K. We would love it if most of our broadcasters would switch to 4K! Satellite operators would be happy too, since they’d get more business.

**Question: What do you expect North Telecom to achieve in the next two years?**

**Hadi Nazari:** North Telecom has always had a vision of being a truly global company. We have made a tremendous effort on organic growth, and based on market experts, we have gone beyond the market standard while the satellite market is shrinking.

We are thinking about growth through mergers and acquisitions as well in line with our growth strategy, and hope to complete another few mergers and acquisitions before the end of 2017. This will allow North Telecom to achieve its revenue growth, and it is in line with the company’s vision for going global.

**Question: North Telecom is currently celebrating 10 years of successful operations. What can you tell us about the major milestones you’ve reached along the way?**

**Hadi Nazari:** North Telecom has reached a lot of milestones; in the past few years, we have achieved tremendous organic growth with expansion around the globe. Announcing offices in Germany, Singapore and Malaysia are examples of those milestones.

One of the major milestones North Telecom achieved was creating a very successful broadcasting hotspot in the region with our partner YahLive. North Telecom jointly with YahLive has been awarded, by ASBU, the Satellite Service Provider of the Year Award for achieving this milestone.

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Disruption in the satellite industry

The satellite industry is certainly in a major state of change. We’ve moved away from standard widebeam GEO satellites to high throughput satellites (HTS) in GEO, medium Earth orbit (MEO) satellites, low Earth orbit (LEO) satellites, small satellites, CubeSats, nanosatellites, and more. Each new innovation delivers capabilities suited to selected applications, providing a more tailored solution to people on the ground. Meir Moalem, Sky and Space Global’s CEO, outlines how nanosatellites will provide an effective solution for bridging the digital divide, creating new opportunities for telecoms, and enabling the Internet of Things (IoT).

The global satellite industry has seen a number of changes in recent years due to advancements in technology, rapid globalisation, and increased government investment in the sector. This is creating new opportunities in a variety of sectors including telecoms and the Internet of Things (IoT).

Disruption in the satellite industry is providing an important economic boost to European economies. For instance, the latest industry report from the UK Space Agency revealed that space continues to be a key infrastructure for the UK, supporting more than £250 billion of output across the economy with telecommunications, navigation, Earth observation and meteorology services. Satellite networks are the fastest growing segment of the global satellite industry, which reported more than US$208 billion in revenue in 2015, according to a Satellite Industry Association report.

Nanosatellite technology in particular is disrupting the industry, offering a cheaper and more versatile solution to traditional satellite communications, which are very costly and typically involve a complex roll-out. Here are our thoughts on a couple of key areas where nanosatellite technology is making headway and can bring a number of benefits, namely in the telecoms sector and aiding the development of the IoT.

Disruption in the satellite industry – bridging the digital divide

There are many regions across the world with little or no connectivity, particularly in developing countries and rural areas. In fact, according to recent data, 51 percent of the world’s population remain offline and unable to take advantage of the enormous economic and social benefits the Internet can offer. This leaves more than 3.5 billion people without digital access, particularly in emerging markets, which are currently underserviced by providers. Poor connectivity in developing countries is a barrier to education, business growth and economic prosperity. However, disruption in the satellite industry is impacting this, working to effectively tackle the problem.

Traditionally, satellite communication has been very costly...
IoT Disruption

and accessible only to a limited number of individuals or organisations who can afford such services. Nanosatellite technology, on the other hand, offers a new solution, enabling the delivery of satellite connectivity at a fraction of the cost of traditional solutions. By harnessing unique technology, it is possible to build a very low CAPEX space infrastructure, based on nanosatellites which are cheaper to produce and launch. This also creates low operational costs because the nanosatellites will be managed by an autonomous network management software programme. Therefore, services of narrowband satellite communications can be offered at much more affordable prices than traditional satellite connectivity services.

New opportunities for telecoms

This creates significant new opportunities for telco providers who have thus far been unable to reach those in remote locations due to lack of affordable technology. Due to a saturated market and fierce competition within the telecoms industry, providers are having to stay ahead of the game and be more open to new business models and technologies.

Partnerships with nanosatellite companies provide an exciting opportunity, opening up a new source of revenue and enabling providers to offer affordable communications services to people in remote locations. Therefore, the opportunities created by nanosatellite technology in the telecoms industry are of mutual benefit to those developing the technology, the telecom providers, and most of all, the people on the ground whose lives will be positively impacted by gaining access to these services.

IoT

Another area which is being disrupted by access to relatively low-cost satellite communications is the IoT. Affordable satellite communications will be of benefit to those managing

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IoT Disruption

IoT and operating sensor networks, particularly in remote regions. IoT already relies on satellite communications - market analyst firm Obis Research recently published a report forecasting that the global satellite enabled IoT market will grow at a compound annual growth rate (CAGR) of almost seven percent between 2017 and 2021.

However, the IoT is currently a trend that mostly affects developed markets because they have the right technology and network infrastructure to enable innovation in this space. This needn’t be the case. Affordable satellite connectivity, enabled by nanosatellite technology, can drive faster adoption of the IoT in developing markets and unlock IoT services in remote locations, where there is currently no communications infrastructure. This also links to the point about bridging the global digital divide, helping developing countries to become more technologically advanced.

This provides opportunities to businesses that want to launch products with IoT features in developing markets. All the features of, for example, connected vehicles, wouldn’t work in areas without robust communications networks. Therefore, a satellite-based communications network that can reach areas of the globe that cellular networks can’t, enables companies that want to sell in those countries to do so. In addition, when thinking about products like connected cars, which are expected to include a number of IoT features in the future, one of the main concerns that arises is cybersecurity. Again, satellite technology provides a solution, offering more reliable cybersecurity than cellular networks.

Providing services anytime, anywhere, to anyone

While these are just two areas in which affordable satellite technology is having an impact, as other new technologies which demand a reliable communications network develop, nanosatellites will become ever more prevalent. By working with telco providers, mobile operators and corporates, nanosatellites can provide all kinds of narrowband communication services: anything from IoT, Machine to Machine (M2), instant messaging, digital financial transfers, data transfers, all the way to voice conversations. All of these services will be provided to anyone, anywhere, anytime.
Come and celebrate with us our 10th anniversary at Rai Amsterdam Booth: 1.A44 www.NorthTelecom.com
Santander Teleport offers commercial and government organizations access to C-band, Ku-band and Secure X-band services from a single location, covering all of the satellites in the GEO orbit from 60W to 65E, thus covering a region from Western Australia to North America, Mediterranean Sea, Indian and Atlantic Oceans. Importantly, the teleport is strategically located in the intersection of the coverage of Xtar satellites, therefore able to uplink and downlink from both X-band satellites. Santander Teleport provides a significant improvement in network efficiency, reliability, and customer service that augments the MTN Ground Network of redundant teleports and dedicated fiber optic links. In addition, it has a fully manned 24/7 network operations center providing European time zone coverage and local language operators to deliver quality service to global customers.

Delivering efficient and reliable services

Santander Teleport, located in the North of Spain, delivers a range of services in C, X, and Ku-band, accessing satellites in the 67 degrees West to 60 degrees East arc. Services include antenna hosting, equipment co-location, uplink, satellite capacity and custom VSAT networks and turnkey solutions. With its state of the art operations infrastructure and fully-manned, 24/7 network operations centre, Santander Teleport delivers efficient, reliable services for service providers present in the maritime, enterprise, broadcast, defence and telecommunications sectors. Amy Saunders spoke with David Andres, Business Development Manager at Santander Teleport to find out more about the company’s services and solutions, and market experiences.

Question: Can you provide an overview of Santander Teleport’s development in the years since its founding?

David Andres: Santander Teleport was founded in 2010. The first ever service consisted of contributing a number of FIFA World Cup matches to serve the cruising sector. Since that moment, the teleport started growing frantically during the following two years, and it has continued growing until today. During these years we have seen various regional and global service providers use our teleport to operate their networks and run NOC and engineering services on their behalf; satellite operators engaging with us to support their satellites in orbit; European consortiums have trusted our RF and satellite expertise to support their technology development projects; government agencies have visited and chosen us to deliver communications to their users; we have won a few industry awards and most importantly, we have been recognised by our customers for our helpful and trustworthy approach to doing business with them.

Question: What capabilities do you have on site today that help Santander Teleport set itself apart from other teleports?

David Andres: Our teleport is in Spain, which is a strategic location for some satellite operators and service providers as it is based in one of the most Southwestern locations in Europe, linking both parts of the Atlantic, and enjoying a mild climate which is perfectly suited for all types of frequencies used in satcomm applications. Our antenna farm currently has 15 medium to large size antennas (plus several smaller ones) across the C, Ku and X-bands, and we expect this to grow in the future. We have our own hub infrastructure and host our customers’ hubs for them. We are licensed to operate X-band services, which allows us to support the Spanish Government and other friendly nations with strategic and secure communications. We have also recently started to access high

Photo courtesy of Santander Teleport
Q&A Santander Teleport

throughput satellites through its gateway beams, giving us access to some of the most powerful and versatile satellites available today. Our project and field engineering teams are second to none, which is why several key customers trust our guys to do jobs for them in the field, at land and sea.

But what I would say that really sets us apart is our passion for what we do. Being a SME with a workforce of telecommunications engineers with broad skills in different areas, we thrive at offering the much-needed flexibility and responsiveness that larger corporations struggle to offer. All staff in our commercial, engineering and operations teams are subject matter experts in the RF, satellite and telecommunications fields, and we can support our customers directly at any stage of the relationship with a very personal touch.

Question: Which services and markets are key to Santander Teleport’s operations?

David Andres: Our main services are standard teleport services (uplink, colocation, antenna hosting, VNOs, connectivity...) which are complemented with added value by our very high technical competence. We also provide managed VSAT services and turnkey solutions to those customers that require the extra value.

Our main markets are primarily enterprise, mobility and government service providers, technical research agencies, and satellite operators. These are the areas where we have differentiated capabilities and can add value to service providers that are looking to strive and gain market share and customer loyalty through top-class services. Any company that truly believes in service excellence and has this at the top of its strategic agenda is the kind of customer which lines up perfectly with our philosophy.

Additionally, we sometimes provide services to end customers in specific niche markets where a very high level of technical consultancy is required. But our philosophy is not to compete with our main customers, i.e. the satcom service providers.

In the future, we expect to broaden our customer base by engaging with service providers and technology providers that serve the aero market. This is an area we have been involved in since back in 2015, when we engaged with a well-known customer in the aero industry and successfully completed a comprehensive technical assessment of aeronautical antennas from five top manufacturers that included live demonstrations of satellite transmissions.

Question: Santander Teleport was selected as one of the World Teleport Association’s (WTA) Top Teleport Operators of 2016. What does this recognition mean to the company as a whole?

David Andres: This is the second time that we are pleased to be part of the WTA top independent teleport operators, and we are very proud to have achieved it without having the resources that other organisations have. This is a recognition to the good and sustained day-to-day work that everyone in the company has done and continues doing since its origin.

Photo courtesy of Santander Teleport
Question: This year, Santander Teleport performed a few upgrades to its infrastructure. How does this improve operations on a day-to-day basis?

David Andres: Keeping our infrastructure up-to-date provides access to new technology releases. We upgraded our iDirect hub to one of the latest software releases this year, enabling our customers a more efficient use of their satellite capacity. We also upgraded one of our Ku-band antennas to support DBS uplink to be able to access an EPIC satellite on a gateway beam... and we did it in record time, which is what our customer needed. Furthermore, a couple of new Ku-band antennas have been deployed to support a major government customer and an equally important mobility service provider. With all these new additions, we increased the capacity our UPS systems to make sure that all the supporting infrastructure is there when you need it, and we never have to suffer from any long service disruptions.

We have also developed a simple and straightforward monitoring tool which is used both internally and by our customers. This has been very well received, and we will continue to develop added value by creating new tools and services that make our operations more efficient and our customers’ lives easier.

Question: Are there more upgrades or expansions expected in the near future?

David Andres: We have two or three potentially major projects in the horizon that - should they go ahead - would take us to the next level of expansion by taking over a plot of land adjacent to our teleport that is already reserved. This has the potential to double the size of the current teleport area.

Question: What do you expect Santander Teleport to achieve in the rest of 2017 and beyond?

David Andres: I expect to continue growing our services with existing customers and, through continuous and sustainable growth, gain the trust of new customers that are looking for a long term, reliable and trustworthy partner that will help them grow and achieve new goals.

We have also reached an agreement to increase the engineering and NOC services that we provide for a global service provider. This is an incredible achievement as it is a prize to our commitment to excellent customer service.

Furthermore, it is not a common service offering in our industry, but a niche area that we have developed by working very closely together with our customer.
H-DNA
An Evolution in Satellite Access

Designed for the Heights™ Networking Platform's return links, Heights Dynamic Network Access (H-DNA) is another example of Comtech's best-in-class capabilities. H-DNA is a culmination of new waveforms, enhanced bandwidth management algorithms and robust multi-layer QoS that make it highly dynamic and automatically able to react to real-time traffic demand. This access scheme is fast, flexible and uncompromised, delivering unprecedented benefits to users, service providers and satellite operators. H-DNA can:

- Rapidly adapt to changing environments
- Deliver superior efficiency & QoE
- Instantly assign capacity based on network-wide demand
- Intelligently utilize total network bandwidth at all times

Contact us today. We are ready to evaluate how H-DNA and the Heights Networking Platform can provide best fit solutions for your satellite network.

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Saving lives with social media

Maybe the everyday doom and gloom of the news makes everything feel worse than it really is, but it seems that in the last 10 years, mankind has faced disaster around every corner. From storms, earthquakes, volcanoes, and terror attacks, it seems like we’re never far away from the next disaster. Disaster recovery systems have been updated over the years as new technologies have become available, and today, more people are receiving help faster than ever before. Up until now, social media has played a key role for users to stay in contact with loved ones from inside disaster areas, but its application has remained relatively small-scale. Today, all that is about to change as Facebook rolls out an innovative humanitarian project.

Satellites have long been used in the wake of disaster, playing a key role in many ways. Satellite imagery has proved vital in determining the extent of a disaster, its continuing development, and, later, helping to identify the precise cause. Using satellite as a connectivity solution is, in many ways, more vital than satellite imagery; when terrestrial communications networks fail in the wake of a disaster, satellites can deliver efficient, full-coverage connectivity, ensuring supplies and personnel can get to where they’re needed most.

We’ve seen a lot of disaster lately, with natural and manmade events alike wreaking havoc around the globe. Social media has been well-documented to play a key part in the aftermath, helping users contact loved ones, check in on friends, and stay informed about current events in real-time. Usually, this has been achieved through personal messaging services, video chat, and public posts, however, in recent years, methods have been evolving.

Delivering Disaster Maps

One of the most popular social networking sites in the world, Facebook, launched its first safety initiative in October 2014. Founder Mark Zuckerberg observed that, in times of crisis, users turn to social media sites like Facebook to check in with loved ones or seek updates, and sought to develop a better, more efficient, way of achieving that aim with Safety Check.

When a disaster event occurs, Facebook personnel activate the Safety Check feature. Any users located in the disaster zone, which is established by Facebook using satellite GPS signals, receive a Facebook notification on their phone asking if the user is safe. With a single click, the user can mark themselves as safe, as well as friends in the same area. Once marked as safe, a News Feed story is generated to let the user’s contacts know of their safe status. In addition, the user will receive notifications of any friends in the affected area who have marked themselves as safe. With the Safety Check feature, users in disaster zones can inform their contacts of their situation with a single click, providing reassurance to loved ones and limiting panic, and saving their time and focus on moving to a safe location, or seeking medical help for any injuries.

Facebook’s Safety Check feature has been activated many times since its launch, although it wasn’t until the November 2015 terror attacks in Paris that it was used in a time of non-natural disaster. Facebook’s Vice President of Growth, Alex Schultz, commented: “We chose to activate Safety Check in Paris because we observed a lot of activity on Facebook as the events were unfolding. In the middle of a complex, uncertain situation affecting many people, Facebook became a place where people were sharing information and looking to understand the condition of their loved ones. We talked with our employees on the ground, who felt that there was still a need that we could fill. So, we made the decision to try something we’ve never done before: Activating Safety Check for something other than a natural disaster. There has to be a first time for trying something new, even in complex and sensitive times, and for us that was Paris.”

In June 2017, Facebook took its next step in providing a safety feature for users with the launch of Disaster Maps. The programme, which will not be used until the next natural disaster, will use aggregated and anonymised Facebook user data to produce three different maps:

- Where people are checking in as safe.
- Where populations are before, during and after a disaster.
- Where people are moving to in the hours following a disaster.

According to Facebook, the Disaster Maps datasets are
aggregated across time and space in the following ways to preserve privacy and to make the data more usable and interpretable to organizations by separating signal from noise, reducing the intermediate processing steps required to move from data to insights to action:

- **Temporal aggregation:** While timely data is needed during a disaster, feedback from Facebook’s partners indicated that organizations do not process and respond to new inputs in real time. As such, data is shared at regular intervals e.g. every hour, every six hours, every 24 hours.

- **Spatial aggregation:** Geolocated points are aggregated to a 360-square meter grid or local administrative boundaries.

- **Spatial smoothing:** Once each metric has been calculated e.g., the number of people in administrative or pixel unit x during time period y, spatial smoothing is performed. For each spatial location, a weighted average of the value in the tile itself is computed with the values in neighbouring tiles; tiles that are closer have a bigger contribution to the final result. This local averaging results in a map with a smoother, clearer signal, reducing noise due to random variation while preserving the key signal and further protecting privacy.

The mapping process relies on Facebook users with their location settings switched on; while non-users might expect Facebook users to value their privacy and have location settings turned off, this is rarely the case given the increase in usability granted with location data.

The maps enable the comparison of the movement of people and places of congregation following a disaster, compared with a normal day, and allow real-time updates. “... if an earthquake happens at 2pm on a Tuesday, you want to know where is everybody an hour after that, and where are people typically at that time on a Tuesday? It’s using multiple pieces of data to help us understand the magnitude of disaster and the location of that disaster,” explained Dale Kunce, Senior Geospatial Engineer at the American Red Cross.

Facebook’s Disaster Maps has been in the works for many months, and is the culmination of discussions with humanitarian organizations. “They helped us identify the data that would be most helpful for them,” said Molly Jackman, Public Policy Research Manager at Facebook. “A lot of the conversation started with Safety Check; at first they just asked us to aggregate that data. The challenge we quickly realised is that a lot of people may not be looking at their phones or checking in as safe. So, we wanted to dig a layer deeper.”

The maps generated with Facebook’s Disaster Maps will initially be shared with The International Federation of the Red Cross and Red Crescent Societies (IFRC), the World Food Programme, and UNICEF, following a disaster event. In time, additional organisations and governments will be able to participate in the programme, according to a statement released by Facebook.

“Accurate maps empower Red Cross and Red Crescent teams to carry out humanitarian missions around the world,” said Jono Anzalone, Vice President of International Services at American Red Cross, in a statement. “Maps help us in so many ways – from distributing relief supplies to preparing communities for disasters. By sharing anonymized location, movement, and Safety Check data with the American Red Cross, Facebook is helping us sharpen the essential tools we need for targeting communities in need, delivering aid, and fighting disease.”

Despite much of the negative press received by Zuckerberg, he has not shied away from using his social media creation as a force for good. Patrick Meier, who was hired by Facebook to consult on the project, described it as “a game-changer for the humanitarian sector,” and observed that, aside from a small number of ad hoc projects, there has been very limited interest in developing new approaches to humanitarian issues. Facebook has been the first to implement such an innovative and far-reaching solution, but it marks a new route that others might follow.

**Connectivity is vital**

When it comes to utilising Facebook and other social media as a tool in the wake of a disaster, one of the key challenges is connectivity. Many areas that play host to a larger than average number of natural disasters, particularly much of Asia, suffer from poor connectivity services on a day-to-day basis, never mind in times of disaster.

In the aftermath of a disaster event, terrestrial connectivity may fail completely, either due to damaged infrastructure from the disaster itself, or network congestion. While social media blackouts in certain areas may be a useful tool in identifying areas where emergency connectivity solutions are most needed, without that connectivity already in place, first responders and emergency services struggle to coordinate recovery efforts.

Satellite has played a key role in delivering this ubiquitous connectivity, in the case of disaster or as a diversified back-up route, for many years now.

As well as enabling emergency response teams, satellite connectivity allows local governments to stay on top of the situation and coordinate people and relief efforts, while maintaining regular operations. Existing and upcoming medium Earth orbit (MEO) and low Earth orbit (LEO) constellations such as O3b Networks, Iridium NEXT, OneWeb, GlobalStar, LeoSat and the SpaceX constellation will continue to make a big difference in disaster recovery capabilities by delivering rapid, easy access to ubiquitous global communications.
Satellites and Dynamic Spectrum Access

Spectrum has been a tricky issue for many years now, and it’s a difficult problem to solve. Spectrum is limited by definition, but an increasing number of people require access to it. Regulation takes time, and change is difficult. Kalpak Gude, President of the Dynamic Spectrum Alliance (DSA) outlines today’s current spectrum model, and how it might be changed in the future.

In a line that might sound unduly dire, but nonetheless true - the satellite industry must either adopt a dynamic approach to spectrum access or risk a future with limited opportunity and growth, and marginalization to serve areas where no one else will or wants.

Communications satellites have had a distinguished history in building greater connectivity. Whether it was in delivering the first voice calls from around the globe, sharing video from the Olympics, or allowing mankind to share the moment a man first set foot on our moon; satellites have been at the heart of the communications revolution. To accomplish these feats, the industry has led in innovative technology developments and spectrum sharing, within the industry and with terrestrial services. The industry has however, in some sectors, fallen on harder times. With more fibre and terrestrial wireless communications deployments, demand for some satellite communications services has stalled and legacy industry players today more often play a niche role in our networked communications architecture. The industry is in a significant phase of innovation to change that perception, but the view among many regulators has been harder to move.

The diminished role of legacy satellites has forced regulators and policy makers to rethink satellite spectrum policy. The momentous contributions to the development of communications and global connectivity by communications satellites were built on a spectrum allocation model that required an enormous block of spectrum (e.g., 1000MHz or even several thousand megahertz) to be made available to satellite services. The spectrum was shared, but generally in a limited manner between satellite operators through the spacing of satellites, or with point-to-point terrestrial microwave systems. The sharing was effective, but was static and limited.

Today, those large blocks of satellite spectrum have become an almost irresistible target for governments, policy makers, and others in the communications industry looking for new spectrum to meet growing demands for broadband wireless services. Large blocks of contiguous spectrum are
It is clear that a new regulatory model for satellite spectrum could be staring into the abyss if they do not embrace these 'not in my backyard' approach in the satellite industry approach will be required by regulators. Those that cling to or Q-band under the old model. A more intensive sharing to obtain the 1000–2000MHz or more of spectrum in V-band example, there is virtually no chance for the satellite industry justify new spectrum opportunities for future growth. For as well as made it more difficult for the satellite industry to created a risk to the long-term access to that very spectrum, as well as made it more difficult for the satellite industry to obtain the 1000–2000MHz or more of spectrum in V-band or Q-band under the old model. A more intensive sharing approach will be required by regulators. Those that cling to the 'not in my backyard' approach in the satellite industry could be staring into the abyss if they do not embrace these growing terrestrial requirements.

New models
It is clear that a new regulatory model for satellite spectrum is coming. There are two likely scenarios for the next generation of spectrum management approaches, both for satellites and terrestrial systems. One approach is a continuation of the static model, using frequency separation (I operate in one band or sub-band, and you operate in another) or geographic separation (I operate here, and you operate there) to enable sharing. This approach has led to a gradual loss of access to spectrum the industry uses or could use, or loss of access to markets (often lucrative urban and suburban areas) where customers and services, including broadband, are most in demand. For terrestrial systems, the cost of this approach has also been counterproductive, as the zero-sum game has yielded only a portion of the potential spectrum and only after years of spectrum battles and delay.

An alternative path, in bands where sharing is possible, is a dynamic approach where parties use technology (databases, location identification, sensing, and more) to identify who is using spectrum at a given location and time, and opportunistically enable additional use. In spectrum where the satellite industry is already operating, the opportunity to have current and future services protected would provide a very attractive scenario; an opportunity to share that would put few constraints on satellite services and ensure long-term access to the spectrum. This approach, of course, provides respect for incumbent services and creates the possibility of opening vast amounts of new spectrum for broadband services.

The Federal Communications Commission (FCC) in the US has already embraced this type of solution for the lower portion of the C-band, where satellites are one incumbent (albeit with limited use) along with the US Government. Under the FCC's Citizens Broadband Radio Service (CBRS) rules, the US Government's Navy radar services, along with the limited satellite service deployments in the band, are protected from interference from terrestrial broadband. The CBRS band will enable deployment of broadband services including densification opportunities for wireless operators, opportunities for companies, campuses, and organizations to improve their own connectivity solutions with their own cap-ex investment, or neutral-host opportunities for both wireless operators and third parties.

CBRS is called by many as the 'Innovation Band' because it uses a three-tier approach to spectrum access between the incumbent, a Priority Access Licensee (PAL), and a General Authorized Access (GAA) user. The US Government and satellite services are fully protected, all the time. PAL tier users will receive rights through an auction process and will be protected against GAA use, but must protect incumbents. GAA users have the benefit of not having to participate at auction, but can use the spectrum subject to provide protection to the other two tiers. In the future, the CBRS approach could be applied to other bands (e.g., C-band uplink and downlink bands) to give satellites services incumbency rights and protections.

Sharing in existing and future satellite bands
Some bands are more compatible for sharing than others, based on the mobility of incumbent services or complex power budgets. The C-band, however, provides an excellent example of a possible sharing band and highlights the current challenges the satellite industry faces in incumbent bands. The industry has opposed efforts from mobile carriers to 'share' the lower portion of the down link band (3.4–3.6GHz) for more than a decade. Regulators have, however, moved incrementally to evict or limit satellite services from portions of the band. At the ITU's World Radio Conference in 2015, the Conference decided to open the 3.4–3.6GHz portion of the band to mobile services, consistent with limited protection of existing incumbent satellite services. Europe has already introduced 3.6–3.8GHz for mobile services. In addition, Japan and Korea have given the entire 3.4–4.2GHz band for mobile services. All indications are that the US will start to look at the entire band, as will others. Although there are regions in the world such as Africa, Latin America, and parts of Asia that have supported satellite use of the C-band, the overall trend line is not favourable for the satellite argument for status quo.

For the satellite industry, dynamic access solutions may be even more important in future bands for which they do not have the benefits of incumbency. Dynamic access solutions could provide satellite services access to spectrum that they are unlikely to get otherwise. The FCC's decision last year in
its Spectrum Frontiers Order was a bell weather for what the satellite industry is likely to face in the future. Despite strong efforts by the industry, and even evidence that operators were already building satellites and ground networks to operate in the portion of Ka-band at issue in the rulemaking, the FCC decided that the band would be opened for 5G terrestrial wireless services. The FCC decided that potential interference from terrestrial services into satellites would have to be studied further and that satellite gateways would be permitted only in small areas throughout the country until it is known how 5G will deploy in the decade ahead.

A dynamic approach to sharing could revitalize the satellite industry’s spectrum opportunities. In existing bands, the industry could gain more long-term certainty to spectrum that would protect existing infrastructure and enable additional future investment. In future bands, sharing will enable access to spectrum currently occupied by terrestrial fixed and mobile services, including 5G, that are suitable for sharing, as well as to higher frequency bands, for example V-band and Q-band, which are generally without significant incumbent services, but are long-planned satellite expansion bands.

Spectrum sharing for NGSOs
Dynamic sharing opportunities for satellites are not restricted to inter-service sharing with terrestrial mobile. The non-geostationary satellite operator (NGSO) world raises another spectrum risk and opportunity for the satellite industry. NGSOs are among the most celebrated new satellite projects, promising to bring new methods of delivering broadband connectivity to the globe. The FCC’s processing round, which was kicked off by the recently approved OneWeb application, received more than ten competing NGSO applications, all seeking to operate in the same Ku- and/or Ka-bands. Although no one expects that all the applicant projects will succeed, it is very likely that more than one will become operational, requiring complex spectrum sharing through coordination and network controls.

Spectrum sharing in a NGSO context raises many of the same issues as between GEOs and terrestrial services. Static approaches to sharing are inefficient and may be even more
Today’s Current Spectrum Model

harmful in an NGSO context, as the multibillion dollar business plans for these global systems often require access to full-band and global coverage. A dynamic access regime, however, could provide a sharing methodology that would enable more intensive use of spectrum and the deployment of more NGSO systems delivering more broadband connectivity. It could further stimulate a greater investment and growth in the entire satellite ecosystem - satellite manufacturing, launch, antenna design, and, of course, services.

Embracing sharing drives greater opportunity

Some players in the satellite and terrestrial wireless industries have thus far not been proactive participants in identifying real sharing solutions. Some satellite operators have held fast to a ‘No Change’ mantra that looks more dated and out of touch with each passing day. The satellite sector too often finds itself without a seat at the table as regulators create the spectrum management policies for the future.

The terrestrial wireless industry also has often refused to embrace new sharing models that would protect incumbents while still opening spectrum for terrestrial broadband services. This has resulted in decade long fights for spectrum access that yielded either no, or only limited, access to new spectrum. WRC-15 was the first time that the terrestrial wireless industry faced a broad rejection of the traditional spectrum clearing model that had been favoured in the past.

If the satellite and terrestrial wireless industries were to embrace and promote a dynamic sharing approach, however, there is an opportunity to build new coalitions necessary to lead the global spectrum debate forward, and enable all of the many broadband technologies that will be necessary to build the next generation networks.

Conclusion

Technologically, and counter to the impressions of many, the satellite industry is in the middle of a wave of new innovations intended to bring the capabilities and economics of the industry in line with the expectations and demands of the marketplace. High throughput satellites (HTS) are lowering the cost per bit to terrestrial levels; NGSO systems are lowering latency; and satellite antenna technology is moving towards cheaper, smaller, and flatter antennas that will change deployment opportunities. These innovations have not, however, changed the general view of regulators or policy makers, whether warranted or not, regarding the relative importance of satellite services.

To change the perception of government officials of an industry staring at its own feet, satellite operators must follow the lead of those in the industry ready to take bold steps forward. New technology and leadership, the roots from which the space industry began, can again spur unimagined innovation.

Dynamic sharing, viewed not as merely a defensive strategy intended to guard the wall, but rather as a sword capable of opening new vistas, is an approach that can enable satellites to return to a role of prominence in the communications fabric of tomorrow.
Live broadcasting is something all of us in the developed world are familiar with. Seeing journalists and reporters live at the scene of major entertainment events, political speeches and dramatic accidents delivers viewers a sense of realism. Live broadcasting can be a complex system to get just right, and it’s by no means cheap to deliver. Here, Morten Brandstrup, Head of News Technology at TV2 and Morten Rishoej, Director of Product Management, Land Mobile BU at Cobham SATCOM, report on a recent project which ultimately proved efficient and cost-effective.

With the bandwidth and coverage potential of new Ka-band high throughput satellite (HTS) networks, outside broadcasters are today well-positioned to accelerate migration towards IP-based workflows and leverage the associated cost and operational benefits this provides. Using a one metre Ka-band antenna solution on a small electronic news gathering (ENG) vehicle can provide identical live streaming, store and forward and comms channel performance to a much more expensive, more complicated custom-built satellite news gathering (SNG) truck with a traditional SVI DVB-S2 workflow using single carrier per channel (SCPC) technology.

Exploring new technologies
Danish broadcaster TV2 is at the forefront of developing IP based workflows. The organisation has four SNG crews working in and around Denmark and international offices in Damascus, Brussels, Washington, Berlin and soon London for international operations, all serving its national channel, 24-hour news channel and public service broadcasting operations. Live coverage is the mainstay of TV2’s output, so developing more reliable and cost-effective workflows using new technologies for outside broadcasting is an on-going strategy.

The station’s latest development is the integration of Telenor Satellite’s Thor 7 Ka-band service into its live broadcasting workflow using a Cobham SATCOM EXPLORER 8100, a ground-breaking new VSAT antenna system and the only auto-acquire, drive-away solution to feature Dynamic Pointing Correction technology. The latter is an advanced antenna stabilisation system, first developed and proven on Cobham SATCOM’s maritime antenna
Live Broadcast Workflow

Making operations easier
A common issue for SNG trucks and ENG vehicles is that even the slightest winds can make them move on their suspension. Using a VSAT service, this can degrade the link and lower bandwidth, which can affect the quality of the live feed. To negate the issue, SNG trucks are often fitted with jacks, which costs money in terms of customisation and installation and adds to ‘time to readiness’ when in the field.

The problem is compounded when moving to a Ka-band HTS service like Thor 7, where the size of the spot beam requires even higher pointing accuracy. Even small movements can cause loss of satellite link and the transmission is cut. EXPLORER 8100 is designed to accommodate any vehicle movements and maintain pointing accuracy. With near perfect tracking, the vehicle that EXPLORER 8100 is installed on does not need to be adapted at all. This is part of the reason that TV2 is able to move away from expensive, large and customised SNG trucks to smaller, more agile SUVs, while still enjoying the ability to reliably stream, or store and forward high definition content.

The new IP-based workflow also uses less hardware, with just one encoder needed. With EXPLORER 8100, the Thor 7 service feeds directly into one cellular bonding unit, which also makes physical operation much simpler. It’s easy to integrate. No coach works are required at all. It has much lower power consumption than a larger system so it can run on the car battery, negating the need to modify electric circuits or add a generator. Likewise, there are no special cables to run. It’s basically plug and play. In fact, it took just two hours to integrate everything on TV2’s ENG vehicle.

Achieving success with Thor 7
Considering that TV2 crews do not have a dedicated technician, the reduced technicalities of the equipment and workflow are a major advantage. Demonstrating the simplicity of the solution, it was actually a TV2 trainee that operated the EXPLORER 8100 integrated in TV2’s IP workflow for the first live broadcast in June this year. The story was the sustained cyber-security attack, which had affected hundreds...
of organisations all over the world including a large Danish shipping company, so a crew was dispatched with the new ENG to report from outside its Copenhagen headquarters.

It was evident immediately that despite the scaling down of all elements in TV2’s live outside broadcasting through this new workflow and technology, there is absolutely no reduced capability. The crew in Copenhagen could deliver flawless high definition footage while using the same system for the communications channel to the studio. Streaming rate in this case was approximately 4Mbps, more than enough throughput for the task at hand. On Thor 7, these speeds are always available, so there is no requirement to secure dedicated bandwidth for specific times either.

Feedback from the crew on the ground for this story was that this is now the preferred solution. A good result for the TV2 News Technology team, as they have successfully introduced a workflow that can use a standard ENG vehicle costing less than 25 percent of a single, customised SNG truck, but also with simplified operations on the ground and live streaming, data and communication capabilities equal to that of the incumbent workflow.

**Changing outside broadcasting**

Cobham SATCOM and TV2 have worked closely towards streamlining live broadcasting workflows for more than ten years. TV2 was previously integral to the development of the portable EXPLORER 710 BGAN system and has provided valuable input to the development of EXPLORER 8100. The system meets very specific challenges that are experienced by outside broadcasters because it has been influenced by the people who work in the field.

Through this user-focused design, EXPLORER 8100 has the ability to radically change the industry’s approach to live broadcasting through the use of smaller, lower cost and indeed more environmentally friendly vehicles, and less costly and complex technology.
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Successful OTT deployment and growth in an unmanaged world

Today, millions of consumers are moving away from traditional linear TV services towards a more tailored OTT solution. People across all age ranges are viewing the benefits of on-demand content, with customers reporting extremely high satisfaction levels, particularly with regards to the flexibility delivered. However, as OTT becomes increasingly widespread, security questions arise. Rodrigo Fernandes, Product Marketing Director at Irdeto, outlines how the landscape has changed, and how operators must evolve their services to stay relevant and secure.

The rapid growth in demand for OTT services shows no signs of abating, as device proliferation increases and consumers expect the content they want to be available on all their devices. As a result, for operators, getting their OTT service to as many screens as possible is the key to winning customers, but the process of OTT delivery itself has not been easy so far. It is actually the industry itself which has made this difficult, with competing technologies doing the same thing on different devices. The upshot of this is that the world of OTT has always been fragmented, making for a challenging landscape for operators to breakthrough to meet the quickly evolving habits of consumers.

It seems that now, however, the tables are beginning to turn, and the industry is making moves to ensure delivering a secure OTT service becomes simpler. From the introduction of MPEG DASH in 2015 to the convergence which has begun towards CBC encryption, operators will begin to find it easier to deploy and grow their OTT offerings, as consumers increasingly expect customized experiences, more content, convenience, and value for money. However, operators must ensure they have the right security strategy in place to deliver high value content to unmanaged devices and ensure their OTT success.

How deployment is becoming easier

DRM fragmentation has previously posed a huge challenge for operators looking to deploy OTT services. To reach popular web browsers and devices, operators must support potentially five DRMs. While supporting multiple DRMs can be frustrating, it is fortunately not very expensive. However, the real challenge around DRM fragmentation is that they all support different media containers and having multiple media containers per video, multiplies costs on packagers, storage and file delivery.
Tailored OTT Solution

However, 2015 MPEG DASH was introduced which has proved the first step to huge cost savings in the fragmented OTT world. It’s an open-standard streaming technology, which is codec and DRM agnostic. With MPEG DASH, operators can use one streaming video format across devices; for both broadcast and OTT. Even Apple has added CMAF (DASH-compatible) video container support to HLS, which means the same video container format can be used on iOS devices (although using different manifests).

While CMAF and MPEG DASH have unified the video file format across devices for OTT, for operators offering a pay TV service, encryption is just as important. The problem here is that there are a variety of encryption technologies to choose from, with Apple choosing one (AES 128 Cyber Block Chaining (CBC) for FairPlay DRM) and everyone else choosing another. Therefore, to offer premium content through OTT, operators must encrypt the file two different ways to cover all major DRMs – doubling the CDN cost.

Fortunately for operators, we are now seeing changes here too – in 2016, Google’s Widevine and Adobe’s Primetime added CBC support, and at NAB 2017, Microsoft announced support for CBC toward the end of 2017. While this does not mean the issues go away immediately, as legacy devices must still be supported as previously until they are phased (and many of these devices and some web browsers may never support CBC), it does help to further smooth the path to OTT deployment and growth.

Addressing unmanaged devices and early window content

These industry developments around OTT are good news for operators, however, with the higher security demands of
new technologies like 4K UHD combined with the undeniable consumer shift towards viewing on unmanaged, connected devices, the challenges do not end there. New content protection requirements around premium content are upping the ante for delivery to unmanaged devices. Many of these requirements we’ve come to expect in managed devices, but they have also raised the bar for OTT services to unmanaged devices, meaning they must have similar security to the STB.

MovieLabs’ Enhanced Content Protection (ECP) specification sets the new bar for what operators must do to get premium content. It ranges from ensuring renewability in CA and DRM, to locking down consumer devices, to end-to-end breach response and watermarking. Meeting these requirements can take a long time and cost a lot of money if operators don’t have experienced security partners on their side. Many video operators are quickly concluding that the only way to get UHD or early window content to these devices is via the devices’ native DRM. In order to obtain the device coverage desired, this necessitates a multi-DRM content protection strategy.

The rapid evolution of the OTT market combined the necessary higher security demands means that it is time for operators to take a step back and review their content protection strategy in relation to their service delivery roadmap – the key question being, is it fit for purpose and future-proof? Some operators may be unprepared for changes or struggling to see the business need for change, but this is a mistake. Content protection strategies have developed dramatically in recent years, and if operators want to continue to deliver consumers the content and cross-device experience they are increasingly demanding, then effective content security is a key enabler for this. The right security strategy can help operators deploy a successful OTT service and fuel their growth in this highly competitive market.
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Satellite News Gathering

Photo courtesy of Melanie Landry, Dejero

Enhancing satellite news gathering capabilities

Satellite news gathering (SNG) plays an essential role in today's world. We've all become used to live broadcasts from major sporting, music, political, and even disaster events from around the world – in fact, today, we expect that the top news channels on TV will deliver us a direct feed to all this and more. The technology has evolved greatly over the years, with more capabilities coming from smaller units. Krystal Dredge, Director of Marketing at AvL Technologies, provides an overview of how capabilities have improved, and what's available on the market today to meet SNG needs.

The satellite news gathering (SNG) industry has changed dramatically over time. In the 1980s, AvL Technologies’ Founder Jim Oliver and his former company SatCom Technologies designed and produced some of the industry's first 2.4m truck-mount antennas. Though heavy and bulky, these antennas were strong performers and many are still in operation.

New technologies
Fast-forward to today and many news trucks have new, lighter weight, versatile and much more powerful SNG antennas. In SNG’s early years, broadcasters mostly operated with 2.4m truck-mounted antennas for both C and Ku-band due to power requirements dictated by analogue technology. Today in many locations it’s still necessary to use a 2.4m antenna for C-band, but with the recent move to digital technology, it’s now common to find 1.2m antennas operating in Ku or Ka-band, and some of these antennas operate in both frequencies. SNG operators are also moving to bonded cellular networks with satellite backup as well as IP transmission over satellite.

Many of the innovations now being used by the SNG industry were driven by truck owners and operators as well as SNG truck integrators. Truck-mount antennas are now much, much lighter than their predecessors, and many can be used on trucks without reinforcement. Jim Oliver's cable drive positioners – originally the licensed Roto-Lok positioner and now the AvL Cable Drive – removed considerable weight from antennas while adding stiffness and removing backlash.

Another significant innovation has come from the makers of amplifiers. Today’s solid-state power amplifiers (SSPAs) and travelling wave tube amplifiers (TWTAs) have been designed to tolerate environmental changes, and they're now...
Satellite News Gathering

more powerful and lighter. With outdoor ratings, SSPAs and TWTAs can now be located on the antenna near the feed instead of inside the truck. And with SSPAs and TWTAs being near the feed, there’s less throughput signal loss, which enables operators to use less power and smaller amplifiers.

Delivering blended solutions
Blended network technology, such as Dejero’s video transport solutions, is another innovation. Many broadcasters have now moved to using this technology, which takes multiple IP connectivity types e.g. cellular, satellite, BGAN, Wi-Fi, blends them together to create aggregated bandwidth, and transports compressed video and data over the blended network. Dejero is an industry leader in delivering live video, and the company’s IP Network Blending solution uses a multiple input multiple output (MIMO) approach and eliminates the risk of transmitting or receiving large data files over one fluctuating or unreliable signal. Dejero’s solution offers high reliability including those with weak cellular signals or increased demand on the network - such as an event that draws thousands of people to one place with few cell towers.

“Dejero’s IP network blending technology enables high reliability by blending different networks to improve availability. This sets Dejero apart - we offer our customers better reliability and cost-effectiveness, and we take this into account with each connection we blend,” said Bill Nardi, Dejero’s VP of broadcast integration and global support.

Dejero also provides Ku and Ka-band satellite communications as a hybrid solution, which is user-configurable in the field, to ensure transmit success when strong cellular signals are not available. “We provide IP over SATCOM, and this enables the news truck antennas to transmit IP video directly to the station, which eliminates video conversion. With a rugged SNG antenna such as an AvL 2.2m for Ku or Ka-band, Dejero can use a variety of high throughput satellites (HTS) to maximize IP video throughput and enable news stations to quickly and efficiently edit the video for broadcast,” said Nardi.

Increasing capabilities
Having the ability to broadcast in multiple bands with one SATCOM antenna has dramatically increased capabilities.

Many broadcasters with large trucks have two or more antennas on the truck and can easily select which antenna to use, or can use more than one at a time for dual broadcasts. Smaller news vans and SUVs today can operate dual-band Ku/Ka antennas. Most dual-band antennas require the broadcaster to swap out the feed and corresponding RF equipment, which can be dangerous in inclement weather.

Frontline Communications, the leading manufacturer of custom broadcast vehicles and only manufacturer that’s ISO 9001 certified, offers an AvL Technologies antenna with a motorized switchable feed system and dual RF kits. This enables the broadcaster to safely switch from one network to another from inside the truck. Prior to the joint development of this antenna by Frontline and AvL, the operator had to switch the feeds while on the roof of the truck. Frontline offers an array of broadcast vehicles with SNG solutions from SUV’s to vans to modular bodies and was the first manufacturer to design and deliver a 2.4m SNG antenna on a van platform.

Many broadcasters still prefer to transmit with C-band, and also would like to use a van instead of a large truck. This can be done with an AvL 2.4m antenna with a segmented folding reflector and its lightweight cable drive positioner. The center segment of the reflector is narrower than the standard full-size van, so a 2.4m antenna with folding side segments can easily be transported on and broadcast in C-band from a standard van.

Meeting ever-changing needs
The SNG industry has changed dramatically since the early days of news trucks and the first 2.4m C-band antennas designed by Jim Oliver and his peers. Today’s satellite broadcasters are finding ways to transmit more data more efficiently and in ways that are immediately editable. There’s no doubt the industry will continue to innovate to get the news to us faster and in more and more ways, and antenna makers like AvL Technologies, news truck manufacturers like Frontline Communications, and live video distribution experts like Dejero, will continue to work with broadcasters to meet their ever-changing needs.
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Rock Seven can trace its history back to its founding in 2005, when a group of specialists came together with the aim of making satellite communications accessible to everyone in a simple and easy to understand way. The company manufactures Iridium-based satellite tracking and communications systems and airtime contracts for organisations ranging from government, military, NGOs, enterprises and consumers. Amy Saunders spoke with Nick Farrell, Director, at Rock Seven to discuss the company’s capabilities and market presence, and the latest trends and outlook.

Nick Farrell: Rock Seven started as an LBS provider, using mobile phones to provide approximate locations to help utility companies manage their staff. It quickly expanded into other forms of location-based services, and started developing its own range of products, which used satellites to transmit as well as acquire positional information. Today, it is a leader in satellite tracking technology, providing a complete service – from the sale of products, the airtime, and the mapping/visualisation services which customers require. It also works extensively in the M2M/IoT field, using Iridium satellite technology to get customer data back from remote areas where there is no GSM or other communication options.

Question: Can you provide an overview of the development of Rock Seven, from its founding to where it stands today?

Nick Farrell: Rock Seven started as an LBS provider, using mobile phones to provide approximate locations to help utility companies manage their staff. It quickly expanded into other forms of location-based services, and started developing its own range of products, which used satellites to transmit as well as acquire positional information. Today, it is a leader in satellite tracking technology, providing a complete service – from the sale of products, the airtime, and the mapping/visualisation services which customers require. It also works extensively in the M2M/IoT field, using Iridium satellite technology to get customer data back from remote areas where there is no GSM or other communication options.

Question: What kinds of products and solutions does Rock Seven provide, and to which markets?

Nick Farrell: Rock Seven is an Iridium satellite specialist. Our goal is to develop low-cost solutions that provide connectivity and tracking from anywhere on the planet. We like to think of it as small satcom for small data, because not everybody needs Big Data over expensive VSAT services. We have a number of compact solutions, designed for specific markets. RockFLEET is for maritime users, while RockAIR was initially aimed at general aviation, and the handheld RockSTAR system is for a diverse set of users on land. These products offer dual tracking and data connectivity functionality, with both RockFLEET and RockAIR featuring the ability to transmit...
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RockBLOCK is a little different as it is a pure M2M/IoT device with a very wide application scope. It is used by ‘home makers;’ the large community of inventors and technology enthusiasts who build their own creative projects. It is also used by academic and research organisations to obtain data from equipment in the field and commercial companies designing contemporary IoT devices or remote sensor stations, for example. RockBLOCK is very small and low-cost. It lowers the entry-point for integrating global satellite data connectivity into any tech project or product.

Question: The market is in a great state of change right now. Where do you see the most opportunities going forwards?

Nick Farrell: The IoT is providing us with a lot of opportunity as there is a real-hunger for compact, low-cost solutions that can provide remote connectivity from anywhere on the planet. While many connected solutions – weather stations, industrial sensors etc – can work with a cellular connection if available, Iridium satellite can guarantee a connection from anywhere. Organisations with critical remote equipment, therefore, require a very reliable connection, and this is best achieved via satellite. Most of our solutions can communicate on dual channels – Iridium and cellular – with automatic failover and least cost-routing, which offers high flexibility.

We also believe there is potential for disruption in the general aviation sector with low-cost data and tracking solutions, which led us to the development of our RockAIR system, which was initially aimed at light aircraft and helicopters. Since its launch though, we have had huge interest from potential customer running vehicle fleets on land, from the government and military to commercial organisations.

Question: Which keys trends and challenges do you expect to impact on Rock Seven’s business in the next couple of years, and how will the company respond?

Nick Farrell: In the maritime world, there is a slow migration to more digital operations, enabled by high throughput satellites (HTS) and existing VSAT networks. While this is allowing more use of Big Data based applications to help drive operational efficiencies, we believe that the need for simple, low-cost vessel tracking solutions will continue to grow. So, while the big satellites look after the big data, products like RockFLEET can look after the low-bandwidth applications, such as ensuring a shipping company knows the whereabouts of its entire fleet at any given time.

This is much the same for fleets of land vehicles. We are seeing growing interest from government, defence and humanitarian organisations, in addition to commercial operators looking for ways to streamline and lower the cost of vehicle and asset tracking. While vehicle trackers have been in use for a long-time, we feel that there is an opportunity for smaller, easier to use and less costly solutions.

In parallel, we are seeing the ‘maker community’ grow and move into the mainstream. Technology development at home, in the garden shed or the basement is now big business, and the makers are looking for low-cost methods to reliably connect their inventions to the Internet – at less than US$200, RockBLOCK fulfils this requirement. RockBLOCK is also...
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### Keynote Addresses:
- Deanna Ryals, Chief of International MilSatCom, U.S. Air Force
- Colonel Cameron Statis, Director General Space, Canadian Forces
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- Bernd Kemper, Service Line Chief, Directorate Infrastructure Services, NATO Communication and Information Agency
- Mike Rapps, Branch Head, Transmission Technology Branch, Code 5550, US Naval Research Laboratory

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seeing growth within the humanitarian segment, with organisations helping remote communities in Africa, for instance. RockBLOCK’s cost and ease-of-use is enabling NGOs and charities to develop technology on a budget that can help to improve the quality of life for millions of people.

Question: The Iridium NEXT constellation is due for launch in the next 2-3 years. How will the new satellites benefit you customers?
Nick Farrell: While it is a very interesting development, our current focus is on getting the most from the established Iridium Short Burst Data (SBD) service, so we feel that, at least in the early days of Iridium NEXT, there won’t be much of a cross-over for our customers.

The first Iridium Certus terminals will be thousands of pounds, which is not a market we address. We are focused on users who need low-cost, but reliable and feature rich data communications either for private/custom projects, academic programmes or low-cost sensor products with medium-sized production runs - think water quality sensors in third world countries or disposable maritime research stations. For these applications, the cost to integrate M2M capabilities has to be in the low hundreds of dollars. Essentially, Iridium NEXT and Certus is a whole different ball game, albeit one that we are very excited about.

Question: In April 2017, Rock Seven launched the world’s smallest plug and play two-way satellite communications system with integrated antenna, the RockBLOCK 9603. What benefits does this product deliver compared to others available on the market, and which markets do you expect to gain the most from its launch?
Nick Farrell: RockBLOCK 9603 is an evolution of our established RockBLOCK platform. It is approximately half the size of the incumbent model, meaning that it is much easier to integrate into a wider variety of M2M and IoT projects. These could be one off custom projects or new products for mass production.

In terms of benefits over other products in the market, for RockBLOCK we are focused on improving the form factor by reducing physical size and driving the costs down, to make M2M connectivity available to more people and for more diverse product integrations.

With Iridium, we have a network that can connect any two points on the planet, and Rock Seven is trying to make using it as inexpensive and easy as possible.

Question: What can you tell us about other future products in the pipeline, and how will they benefit end-users?
Nick Farrell: The Industrial M2M/IoT market is growing at a rapid pace, and we definitely see that there is more development here. It is quite likely that we will bring out some new products to help in this space - always with the goal of making it easy for customers to take existing systems and add satellite communications easily and inexpensively.

Question: What do you expect Rock Seven to achieve in the next couple of years?
Nick Farrell: We hope to continue our expansion into three main sectors; maritime, aviation and land-based tracking and M2M/IoT. Our RockAIR product is certainly being very well received for aviation and land-based applications, and has some excellent features (such as the dual-mode capability with Iridium/GSM) which gives it a real edge. In maritime, our RockFLEET unit is gaining traction in fisheries applications, and we hope to see this roll-out increasing quite significantly going forward.

RockFLEET system. Photo courtesy of Rock Seven
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