ISSUE 70 | SEPTEMBER 2018

SATELLITE PRO

TECHNOLOGY INTELLIGENCE FOR THE

MIDDLE EAST

2018

C-BAND REALLOCATION IN THE US – GOOD OR BAD?
Satellite operators lock horns over US proposal to reallocate spectrum for 5G acceleration

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Elcome on addressing rising demand for broadband on ships

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The UAE's ambitious space initiatives place it alongside an elite few nations on the world map

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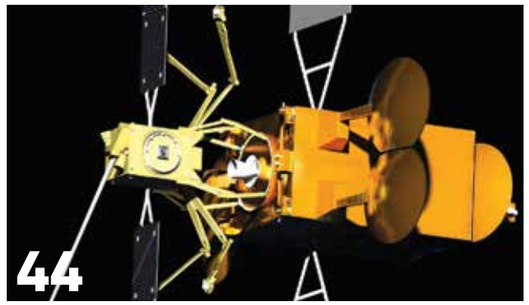

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FOUNDER
DOMINIC DE SOUSA (1959-2015)

PRINTED BY
PRINTWELL PRINTING PRESS LLC, DUBAI

CPITRADE

Licensed by TECOM to registered company,
CPI Trade Publishing FZ LLC whose registered office is
207 – 209, Building 3, Dubai Studio City, Dubai, UAE.
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WELCOME

The UAE is known for breaking a lot of world records – the tallest tower, the world's first hyperloop on the horizon, a seven-star hotel at a time when only five-star properties existed across the world. You name it, the UAE has done it. But when the country's Space Agency announced a hugely ambitious plan to set up a city on Mars in 100 years, the launch of a spacecraft to probe the red planet by 2021, the establishment of the world's largest Mars Science City in Dubai, which will simulate life in a Martian colony, and that it has whittled its list of potential astronauts from 4,000 to nine within a span of four months, the global space community and the rest of us stopped in our proverbial tracks.

This is no vanity project. This nation of approximately two million Emiratis has undertaken this particular project to nurture a generation of home-grown engineers who will have built small and large satellites, done years of research, analysed data from space and become an integral part of the international scientific community.

This nation has already spent $6bn on space initiatives, including the launch of a number of satellites, some of which have been used for commercial services. In fact, one satellite is due to launch later this year and a number of small satellites from universities are being developed as we speak.

As *SatellitePro ME* comes to IBC representing the MENA region, we bring you one of the most prestigious space initiatives in the history of the Arab world.

But that's not all. From the controversy surrounding the reallocation of C-band in the US to what makes the maritime industry tick, from how satellites are evolving to aid broadcasters to the hottest launches at IBC2018, this issue has a lot in store for you. See you at the show.

VIJAYA CHERIAN
Editor
SatellitePro ME

MBRSC appoints Hamad Obaid Al Mansoori as Chairman

APPOINTMENTS

Mohammed bin Rashid Space Centre (MBRSC) has announced the appointment of Hamad Obaid Al Mansoori as its new chairman. Yousuf Hamad Al Shaibani will serve as his deputy. The board, which will serve a three-year term, comprises Mohammed Abdullah Al Zafeen, Mohammed Saif Al Meqbali and Mansour Jum'aa Bu-Aseibah.

Ghassan Murat MD of Eutelsat Middle East

APPOINTMENTS

Eutelsat has promoted Ghassan Murat to Managing Director at Eutelsat's Middle East office. He is also VP of Business Development & Strategy. Murat has worked at Eutelsat for more than eight years.

Taqnia Space to expand its in-flight connectivity services

NEW INITIATIVE

Saudi Arabia's Taqnia Space (TSC) has signed a multi-year contract with Eutelsat including incremental multi-transponder wide-beam capacity on the EUTELSAT 70B satellite as well as the fifth HTS spotbeam on EUTELSAT 3B, on which it already operates the four others.

This incremental capacity will enable Taqnia Space to add more space assets to its high-density bandwidth coverage over MENA and Europe, and expand TSC in-flight connectivity services over Central and Southeast Asia. New capacities added to the TSC aero platform will be used as a part of a global connectivity package called UON, expected to be launched on the Saudia fleet in Q4 of 2018.

Using their personal devices (laptops, tablets and smartphones), airline passengers flying over these regions will be able to access live television, connect to broadband internet and use cellular voice or data services on aircraft equipped with the TSC aero connectivity solution.

Speaking about the deal, Abdullah Al-Osaimi, CEO of Taqnia Space, said: "Over the last few years, in-flight connectivity has become a must-have for passengers looking for an ever-improving air travel experience that allows them to continue using their digital devices without disruption. By extending the contract with Eutelsat on EUTELSAT 3B and adding new capacity over a wider area through leased resources on EUTELSAT 70B, we are able to deliver a high-quality response to the exponential requirements of the airlines we partner with and ensure continuous global connectivity service."

Rodolphe Belmer, CEO of Eutelsat, added: "This agreement marks a new milestone in our relationship with Taqnia Space. It highlights the capacity of our satellite fleet to meet the growing needs of the largest operators in the field of in-flight connectivity and to support the rise of the new norm: being connected everywhere and at all times."

Arabsat partners with TDM to launch promo channel in Mauritania

PARTNERSHIPS

Arabsat & Télédiffusion de Mauritania (TDM) launched the Mauritania Promotional Channel on Arabsat-5C at 20-degrees East to reach the entire African continent during the activities of the 31st Ordinary Session of the Assembly of Heads of State and Government of the African Union (AU), which took place from June 25 to July 2, 2018 in Nouakchott, the Islamic Republic of Mauritania.

"In the course of developing our partnerships and cooperation ties across North Africa, particularly in the Maghreb, we're excited to have launched the Mauritanian Promotional Channel on Arabsat-5C during the works of the AU summit. This channel helped the Mauritanian government to perform the planned media coverage and to deliver the AU daily sessions, meetings, conclusions and recommendations to the concerned global and regional media distribution outlets," commented Khalid Balkheyour, President and CEO of Arabsat.

"This comes along with our ongoing collaboration with TDM to put the final touches on its ambitious project to migrate the Mauritanian public channels into high definition – exclusively – on Arabsat BADR-4 by the end of 2018."

Yahsat announces new CEO for Thuraya, restructures top management

RESTRUCTURE

Hot on the heels of an announcement that Yahsat's subsidiary Star Satellite Communications had concluded a deal with Etisalat to acquire a majority stake in mobile satellite services operator, Thuraya Telecommunications Company, the Abu Dhabi government-backed satellite agency also announced the appointment of Ali Al Hashemi as Thuraya's new CEO.

Star purchased Etisalat's 28.042% stake in Thuraya for $37m. Star acquired the stake after receiving regulatory approvals and meeting Yahsat's condition of "acquiring at least 75.001% ownership in Thuraya".

Ali Al Hashemi, who has led Yahsat Government Solutions for the last few years, will helm Thuraya while continuing in his existing role. Thuraya's former CEO Ahmed Al Shamsi will serve as Advisor to Ali Al Hashemi.

Ali Al Hashemi will continue to head Yahsat Government Solutions in addition to his new role as Thuraya's CEO.

Masood M. Sharif Mahmood, CEO of Yahsat, stated that the Thuraya acquisition will help Yahsat grow and diversify its business, bolstering its satellite solutions capabilities on both government and commercial fronts.

"By integrating the portfolios of the two companies under Ali Al Hashemi, we will together be able to offer a comprehensive mobile and fixed satellite services portfolio," he added.

Yahsat has also named Marcus Vilaca, Yahsat's CTO, as Thuraya's CTO.

Shawkat Ahmed has been appointed as Thuraya's CCO, succeeding Rashid Baba's tenure as Thuraya's Acting CCO. Ahmed brings 22 years of experience in satellite communications, having held senior commercial leadership roles in Yahsat, Thuraya and Telstra V-Comm.

Ali Al Hashemi hailed Ahmed Al Shamsi for his "leadership and contribution towards building Thuraya".

"Ahmed is a true veteran in the satellite industry. Thuraya will benefit from his expertise through his advisory role."

Thuraya's two satellites, serving over 160 countries, will join the Yahsat fleet, expanding the group's satellite fleet to five. The combination of geostationary satellites operating in the C-, Ka-, Ku- and L-bands will cover EMEA, South America and Asia, providing a broad range of fixed and mobile satellite services spanning voice and data communications to both commercial and government sectors.

Yahsat enters mobility and IoT segments with Thuraya

ACQUISITION

The recent acquisition of Thuraya will boost Yahsat's plans to enter the mobility and Internet of Things (IoT) segments, while also possibly competing with telecoms service providers for higher growth.

"Everything is sensored and metered and [whether consumers] choose telecoms service providers or satellite is not a big challenge. What we're seeing is that as the industry starts providing live solutions on the sensors – mobile solutions – the adoption of this will also be on a higher sort of scale," CEO Masood Sharif Mahmood was quoted as saying to *The National* at the company's headquarters in Abu Dhabi.

According to the report, Mahmood was referring to live asset tracking through GPS, which is increasingly becoming merged with business analytics and AI, particularly when it comes to cross-country regional mobility, which can be better serviced by satellite-over-telecoms service providers.

According to International Data Corporation in the US, the IoT market in the MEA region is set to grow 15% to reach $6.99bn in 2018 and $12.62bn by 2021.

Yahsat's third satellite, Al Yah 3, was launched in January and is expected to increase the operator's footprint in another nineteen countries, including newer markets in South America. YahClick, the operator's satellite broadband service, has already grown to cover around 50,000 devices.

"When we mix our old and new fleet, our satellite broadband will cover 60% of the populations of Africa and 95% of Brazil," added Mahmood.

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Nine finalists for UAE Astronaut Programme

NATIONAL INITIATIVE

Nine candidates have qualified in the penultimate round of the UAE Astronaut Programme, initiated by the Mohammed bin Rashid Space Centre (MBRSC). Following the selection of the final four astronauts, the first Emirati astronaut is scheduled to launch and arrive at the International Space Station in April 2019.

This programme was launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai; and His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, as part of the UAE National Space Programme. It aims to train and prepare a team of Emiratis to be sent to space for scientific missions.

The UAE, represented by MBRSC, and Russia, represented by the Russian Space Agency Roscosmos, have also signed an agreement to send the first Emirati astronaut to participate in scientific research in a Russian space mission to the ISS, aboard a Soyuz-MS spacecraft.

Similarly, the UAE has signed a Letter of Intent with the National Aeronautics and Space Administration (NASA) to cooperate in the peaceful exploration of outer space and the UAE astronaut programme.

The programme is funded by the ICT fund of the Telecommunications Regulatory Authority (TRA). Launched in 2007, this fund, the first of its kind in the Arab world, aims to support research and development within the ICT sector in the UAE, helping it to grow into a nationally significant industry with a leading place in the world.

The first Emirati astronaut is intended to arrive at the International Space Station in 2019.

Boeing buys Millennium Space Systems

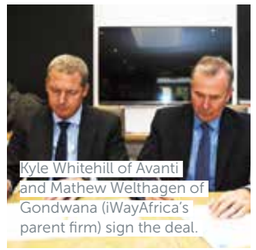
ACQUISITION

Boeing will acquire Millennium Space Systems, a manufacturer of small-satellite solutions, under an acquisition agreement that will see the aerospace giant expand its satellite product portfolio. California-based Millennium Space Systems was founded in 2001 and develops high-performance satellites for exacting missions ranging from 50kg to more than 6,000 kg. Financial terms of the deal were not disclosed.

The acquisition, which is subject to customary conditions, is expected to close by Q3 of 2018. Once finalised, Millennium Space Systems will become a Boeing subsidiary, and report to Phantom Works' Vice President Mark Cherry.

"Millennium Space Systems' expertise in vertically-integrated small-satellite solutions complements Boeing's existing satellite portfolio, and will allow us to meet the needs of a diverse customer set," Leanne Caret, President and CEO of Boeing Defense, Space, and Security, commented.

Avanti inks distributor deal with iWayAfrica for HYLAS 4


Kyle Whitehill of Avanti and Mathew Welthagen of Gondwana (iWayAfrica's parent firm) sign the deal.

PARTNERSHIPS

Satellite operator and solutions provider Avanti Communications Group and iWayAfrica, a pan-African service provider, offering telecom solutions across Africa, have sealed a HYLAS 4 Master Distributor contract. According to the deal, iWayAfrica can use Ka-band satellite technology via Avanti's HYLAS 4 satellite, which offers 100% coverage of Sub-Saharan Africa. iWayAfrica will provide affordable high-speed satellite broadband to homes, schools, SMEs and enterprises across Sub-Saharan Africa, especially in rural and remote locations, where terrestrial networks are limited.

HYLAS 4, which launched in April 2018, will extend iWayAfrica's Ka-band offering across West and Central Africa, with commercial service having commenced in August 2018.

Bahrain announces plans for first satellite

NEW SATELLITE

Bahrain is looking to set up a highly qualified team to launch its first artificial satellite in space within the next two years, according to a statement published by Bahrain News Agency.

The National Space Science Agency (NSSA) will cooperate with the University of Bahrain and Bahrain Polytechnic, among other academic institutions.

Speaking on the Instagram Live account of Bahrain News Agency (@BNAnews), Transportation and Telecommunications Minister in charge of the NSSA, Kamal bin Ahmed Mohammed said: "The

Kingdom is planning to optimise the use of space sciences within five years to serve national development and keep abreast of global strides.

"The NSSA has so far received up to 400 applications to be part of the team and we are expecting more candidates."

Ten university engineering graduates aged less than 35 years will be selected to make up the core of the planned space team.

"A five-member jury made up of NSSA officials and overseas experts will select the ten candidates in total transparency," the minister said, adding that he will personally meet the candidates who will undergo a two-year-training programme, which starts in October.

The first artificial satellite is planned to be announced within the next six months, the minister added during the Instagram Live Broadcast, which was followed by around 4,700 people.

A total of fifteen companies have, thus far, expressed their readiness to support and fund the construction of the artificial satellite, in addition to employing and training the ten selected candidates.

The UAE, with its space expertise, has also been asked to identify candidates to be part of the Bahraini team. The NSSA minister extended thanks to the Kingdom of Saudi Arabia and the UAE for their support.

NorthTelecom partners with KNS in South Asia

PARTNERSHIP

NorthTelecom has entered into a partnership with KNS, a leading marine antenna manufacturer in South Korea, as part of its efforts to strengthen its position in the South Asian market.

NorthTelecom previously acquired Malaysian telecommunication company Scopetel, which has particular expertise in the oil & gas and maritime segments of the market.

By leveraging their respective skills to meet customer needs, both NorthTelecom and KNS hope to increase the profitability of their market share and client base.

Speaking about the partnership, Hadi Nazari Mehrabi, CEO of NorthTelecom, commented: "The future of the satellite market lies in building strong partnerships and alliances. Such a progressive move will enable us to increase our footprint in both the oil & gas and the maritime telecommunication sector. By venturing into the market with KNS, we will be able to provide cost-effective and high-quality services to our customers."

NorthTelecom is also providing storage facilities to KNS for its antennas at its warehousing facilities across the globe.

AsiaSat expands Ina Lui's role following CCO's exit

APPOINTMENTS

AsiaSat, which recently announced the appointment of Ina Lui, has expanded her role to Senior VP, Commercial, Business Development and Strategy, following the exit of CCO Barrie Woolston. In her newly expanded role, she will assume additional responsibilities in commercial and marketing.

She has more than 25 years of experience in the satellite, telecommunications and technology sectors, covering areas in commercial, marketing, product and business development. She has

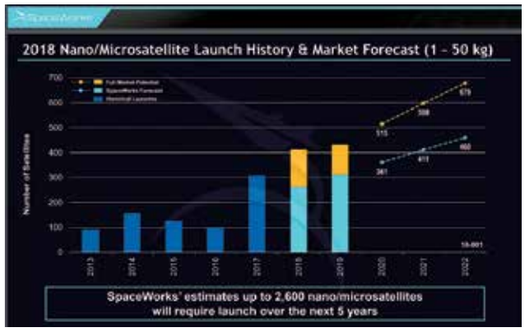
worked in Singapore, China and Hong Kong, and has held senior management positions at ABS, Intelsat, PanAmSat and Hong Kong Telecom. Prior to joining AsiaSat, Ina was Managing Director, Sales Asia Pacific at ABS, where she was responsible for sales and business initiatives for the region.

263 small satellites gear up for 2018 launch

REPORT

An estimated 263 nano/microsatellites will be launched in 2018, slightly fewer than the record set in 2017, according to the new '2018 Nano/Microsatellite Market Forecast, 8th Edition' released by SpaceWorks. In 2017, there was a 205% increase in microsatellites launched compared to 2016, according to the report. The global launch market demonstrated broader acceptance of small satellite rideshares and traditional launch vehicles accommodated a record number of small satellites awaiting launch, significantly reducing the backlog building since 2015.

Key findings in the report are that an estimated 2,600 nano/microsatellites will require launch over the next five years. Of these, communications satellites



are expected to make up over 20% of the nano/microsatellite market. Much of the activity in this space is centered around serving the Internet of Things (IoT) and machine-to-machine (M2M) market. Communications operators will need to secure additional capital to execute their deployment plans. SpaceWorks estimates that as many as 700 nano communications satellites will require launch over the next five years. Sizes in the microsatellite segment are also increasing, to accommodate demand for additional payload capabilities. The 3U form factor is still expected to remain the standard in the market over the next five years.

The report also states that the 1-10kg segment of the nanosatellite segment is still the most favoured by operators, but the 11-50kg and up range is also increasing in popularity.

The PSLV is rapidly positioning itself as the go-to rideshare launch vehicle and delivered a record setting 104 satellites in a single launch this year.

To conclude, SpaceWorks projects that 2018 will be a strong year for microsatellite launches, with 263 new satellites expected to launch, a 15% decrease from 2017, but an overall increase of 160% from 2016. Commercial Earth observation and remote sensing constellations will make up 50% of the market over the next five years; communications constellations are expected to account for an additional 20% of the market. The future of the microsatellite market will depend largely on the ability of operators to secure capital in the near term and create sustainable customer relationships in the long term.

Yahsat and Tanaza tie for YahClick Wi-Fi Enterprise

NEW LAUNCH

Yahsat has launched YahClick Wi-Fi Enterprise Solution in partnership with Italian Wi-Fi cloud management software provider, Tanaza. They have also signed a deal that allows Tanaza's cloud-based Wi-Fi management platform to be used along with YahClick Wi-Fi Enterprise Solution across YahClick's footprint.

The solution provides a cost-effective, high-speed, reliable Wi-Fi solution to address the connectivity requirements of enterprises, NGOs, governments and communities across Africa, the Middle East and Central and Southwest Asia. The solution promises to drive sustainable socioeconomic development through reliable high-speed connectivity to remote areas in the region.

Eutelsat sells stake in 25-B satellite to Es'hailSat

ACQUISITION

Eutelsat has sold its stake in the EUTELSAT 25B satellite operated at 25.5-degrees East to co-owner Es'hailSat for $156.84m (€135m).

Eutelsat's share of the satellite generated FY2018 revenues of $18.23m (€16m) in the video application.

A statement from the satellite operator said that the divestment of this non-core asset is in line with its strategy to "optimise its portfolio of businesses in the context of its policy of maximising cash generation".

"It has no impact on Eutelsat's revenue objectives, which are at constant perimeter and will be absorbed within the group's EBITDA margin target. The discretionary free cash flow objective excludes the impact of the disposal."

EUTELSAT LEADING THE EXPANSION OF TV SERVICES ACROSS MENA

MENA's TV market is one of the most exciting and dynamic worldwide, with overall growth of television viewers higher than ever. Eutelsat, one of the world's leading operators of communications satellites, operates the most popular satellite neighbourhood in MENA and develops innovative services enabling broadcasters to maximise market potential. Regional service provider NOORSAT joined the group in 2017, combining in-depth market expertise with regional and global connectivity, creating a one-stop-shop for broadcast and data solutions.

Ghassan Murat, recently appointed Managing Director of Eutelsat Middle East, explains why Eutelsat is leading satellite broadcasting in the region. "Satellite remains the unrivalled digital video infrastructure throughout MENA with 59 million homes receiving TV channels via satellite. 7/8° West is first choice for viewers, reaching 56 million homes."

Number 1 TV distribution platform

The 7/8° West position, commercialised by both Eutelsat and Nilesat, is MENA's leading video neighbourhood, reaching 90% of TV homes and 95% of satellite homes in the region. This was confirmed by Eutelsat's 2017 TV Observatory, a multi-national analysis of TV reception trends, carried out with independent market research specialist IPSOS.

This key video neighbourhood connects broadcasters to 56 million homes, and grew by 3 million homes in 12 months. Over half the channels broadcast exclusively


Ghassan Murat, Managing Director, Eutelsat Middle East.

from the position, and viewers are drawn to the neighbourhood for its exceptional line-up of 1,300 Arabic and international channels, with best-in-class pay-TV platforms and high diversity of free-to-air content.

"There's a visible shift in free-to-air channels with over 120 now broadcast in HD from 7/8° West, up 44% in 2017," said Murat. "Image quality is increasingly important to audiences, as the acceleration in take-up of HD shows." 46% of total TV homes now own an HDTV screen. 7/8° West leads this growth with an impressive 66% of homes HD-equipped.

Evolving user experience

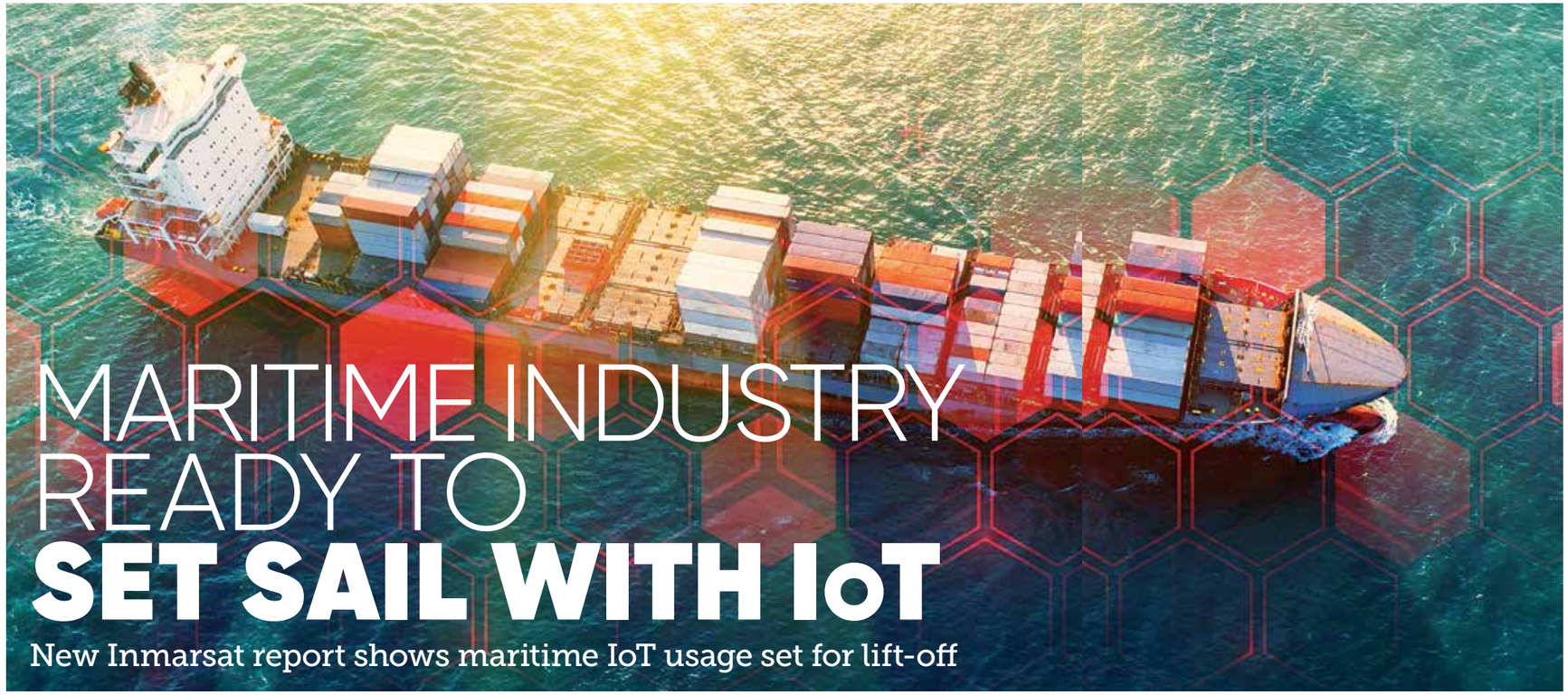
Viewing habits are diversifying as interaction and content on-demand is changing how, where and when audiences consume content. At the same time, linear TV is still the principal means of TV consumption across the region, enabling advertisers to reach millions of homes and content owners to build brand value and deliver sports, news and popular entertainment most efficiently.

Eutelsat's new state-of-the-art hybrid content delivery solution helps broadcasters meet increasing customer expectations for a flexible, seamless content experience across multiple screens. Delivering consistent quality to any screen, the fully supported solution combines the strengths of traditional DTH with next-generation features, reducing the technical and logistical challenges inherent in building a content distribution business.

Reaching more homes

"As broadcasters look to attract new audiences, launch new services and connect with people at home and on the move, our new solutions enable end-to-end connectivity of TV delivery, and enrich the viewing experience," said Eutelsat's Murat. "Working with many of the leading companies in the region, we see great potential for growth and considerable scope for innovative solutions."

Ideally placed to help broadcasters maximise their reach, Eutelsat's innovative advanced TV delivery solutions meet evolving consumer demand. By enabling clients to reduce the complexity and cost of their operations, they can maximise service quality, connectivity and audience reach. In the coming weeks, customers will be able to experience the exiting new portfolio of Eutelsat's hybrid TV delivery services live at IBC 2018, Amsterdam, and TV conferences across MENA. PRO



MARITIME INDUSTRY READY TO SET SAIL WITH IoT

New Inmarsat report shows maritime IoT usage set for lift-off

The maritime industry may be more advanced in strategies to adopt the analytic, management and operational tools available via the Internet of Things (IoT) than many have supposed, according to new research commissioned by Inmarsat. Findings suggest that regulatory factors are playing a central role in maritime uptake, with the need to monitor emissions a key driver, but that a distinct group of owners are seeing IoT-based solutions as the gateway to a more efficient maritime industry.

Published in June 2018 as part of the new Inmarsat Research Programme 2018, the satellite group's 'Industrial IoT: Land and sea' research report is based on 750 interviews by researchers at Vanson Bourne exploring use of IoT-based solutions in the supply chain, among respondents in maritime, transport and logistics, energy, mining and agriculture.

The new report offers insights into prevailing commitments and attitudes towards IoT-based solutions in the supply chain, with its maritime part allowing 125 respondents (92 from shipping and 33 from fishing) to speak for themselves. Respondents came from companies owning a mix of vessel numbers across a full range of types. Owners from Greece made up the largest constituent (25), followed by Japan (20) and Germany (15); container ships represented the largest commercial ship type, with vessels otherwise split among tankers, bulk carriers and offshore vessels.

One of the most striking findings is that maritime respondents expect average expenditure per business on IoT-based solutions to amount to $2.5m over the next three years. While this is less than the figure established for the logistics sector, it puts maritime significantly ahead of the average spend projected by respondents among clients in the energy, agriculture and mining sectors.

Maritime respondents also say they intend to invest a larger share of their IT budgets (7.8%) in IoT-based solutions than in any other next-generation technology.

Drilling down into the report, owners show themselves as also exhibit a marked ambivalence towards IoTsolutions that is unique to the sector. Enthusiasm in some quarters is tempered, in that the industry is also home to the largest group of IoT "laggards" – a description applied to over 25% of respondents. While 33% of maritime respondents believe IoT solutions will bring savings of 10-20% within five years, 14% believe that even then there will be no savings at all.

But direct operational savings are not the only savings available from deploying IoT solutions in the maritime sector, according to respondents. Cutting marine insurance premiums is cited by 70% of respondents as one of the most important drivers for adoption.

When it comes to their cyber vulnerabilities, respondents are more concerned about data storage methods (55%), network security (50%) and potential mishandling of data (44%) than they are about targeted attacks (39%), but only 37% report initiatives to improve security training, with just 25% working on new IoT security policies.

The industry's lack of cyber preparedness shows a deeper malaise over more full-blooded commitment to IoT solutions in some quarters: overall, the industry's lack of decision-making skills is the most frequently cited impediment to uptake (by 56% of respondents). Maritime also identifies itself as behind the curve when it comes to planning skills; 42% of respondents believe their organisations would benefit from additional skills, against a figure for all respondents expected to amount to 37%.

A different frustration appears to be thwarting ambitions among those already fully engaged in IoT solutions. Here, 51% of the maritime audience cited the time lag between data collection and its availability as an obstacle blocking their optimisation of IoT solutions – 11% ahead of any other explanation. This is despite the finding that only 20% of maritime respondents cite connectivity issues as a barrier to adoption of IoT solutions within their organisation – lower than any other sector.

However, to assess the maritime industry's readiness to adopt IoT-based solutions on owner testimony alone is to overlook the fact that much of the technical expertise historically held in-house has been outsourced to ship managers and equipment suppliers.

Marine equipment can contribute 70% of the value of a new ship, meaning it has been suppliers rather than owners making the running on connectivity, big data analytics and app-triggered remote diagnostics and preventive maintenance. Some 64% of maritime respondents said they would use an external partner to facilitate either "some" or "as much as possible" of their efforts to develop IoT solutions.

Nevertheless, in one of the most thought-provoking aspects of the report, early analysis also places maritime ahead of energy, agriculture and mining when it comes to attitudes towards IoT solutions, with 34% of maritime respondents equating their position as one of "full deployment", compared to a share of 21% among all 750 respondents and just 2% in the mining sector.

Driving the maritime "leaders" is the need for ships to be more cost-efficient, cleaner and safer than ever before, with 56% of maritime respondents already using or trialling smart asset monitoring. For the moment, fishing lags marginally behind commercial shipping, but the disparity may be short-lived: 57% of the 33 fishing organisations polled envisage uptake over the next 24 months. PRO

TO INFINITY AND BEYOND

With astronauts space-bound in under a year and a Mars initiative spanning 100 years, the UAE space programme is staggering in scale and pace. *Vijaya Cherian* meets with UAE Space Agency's Director General HE Dr Mohamed Nasser Al Ahbabi and his team to understand how the country's space ambitions will help build a sustainable future

The last year has seen the UAE ramp up its space efforts to a pace that has the world offering grudging respect. We live in the UAE at a time when history is in the making, with the country's leadership announcing a string of ambitious space initiatives that will serve as the bedrock for a sustainable future for the nation's youth while also strategically placing it in a very elite league of countries that have meaningful space programmes.

The UAE Space Agency, the brainchild of Director General HE Dr Mohamed Nasser Al Ahbabi, is heading this initiative. To ensure the agency remains agile and focused on its core objectives, it has delegated research and science projects to the national universities, while engaging with existing national space partners like the Mohammed bin Rashid Space Centre (MBRSC) and Yahsat for bigger satellite projects.

Dr Ahbabi, who has a doctorate degree in Laser and Fibre Optics from the UK, was involved in the UAE's satellite initiative long before he secured approval to start the Space Agency. But he says his passion for space is rooted in Arab culture and dates back to before his skills brought him to the drawing board.

"In Arab society, falconry is a tradition and often, after a day of hunting, it is customary to spend our nights sleeping out in the desert," he explains. "Typically, in the desert, we tend to spend hours gazing at the sky and identifying the stars our grandparents told us about. The older people in our society never went to school, but they knew each star by name and their direction, and they have passed that on orally from one generation to the next.

"Long before GPS came into existence, we had people who excelled in science and astronomy in the Arab world. This is because there was another big need as well. When we pray, we face the direction of the Kaaba in Mecca and this was always deduced by looking at the stars, so this is something we have all learnt as children."

The real turning point for Dr Ahbabi came when he returned in 2005 from the UK to the UAE after completing his PhD.

"I was asked to be part of the new Yahsat project back in 2005. I learned a lot through that programme. I was hooked to space by then, and on interacting with the international space community, I realised that we needed to be part of a strategic space programme that was not just a project. I did a lot of research and went back to our leadership with a proposal supported by evidence and documentation. They told me to establish it."

Having worked on start-up projects for the government before, Dr Ahbabi had a distinct advantage when it came to setting up the UAE Space Agency in 2014.

"The leadership gave us the opportunity to plan the agency the way we wanted to do it. So we looked at various international models to see what would suit us best. We knew that we wanted to be a dynamic organisation that could move quickly with our ideas, and we wanted to be like Space 2.0 – very active in the commercial aspect of space. With the private sector entering the space segment

Director General HE Dr Mohamed Nasser Al Ahbabi says his passion for space is rooted in Arab culture.

Khaled Ali Al Hashmi says the agency encourages collaboration between local universities.

> "One thing that we are really proud of is the fact that Tawazun Precision Industries (TPI), a local company, is manufacturing around 65 components for this spacecraft in the UAE. We pre-qualified them in coordination with MBRSC and now they are producing these components"
>
> **Khaled Ali Al Hashmi, Director of Space Missions, UAE Space Agency**

things had started to move very fast while governments got more involved in regulation, facilitation and support. We wanted to ensure that our organisation had its eyes set on the future. That is why we looked at futuristic projects like manned space missions and space tourism. We wanted to create a clear road map. With space, you need to have a very clear plan because it is a very costly exercise."

So far, the UAE has invested $6bn in various space activities. In keeping with its objective of ensuring efficient implementation of projects to attain the goals set by the UAE government, the agency decided not to establish its own centres or bring everyone under its umbrella.

"That would have slowed us down. Instead, we decided to collaborate with existing organisations in the private and public sector, and engage their services based on their expertise. In the commercial space, for instance, we try to support our companies towards buying and operating satellites. When it comes to research and development, we work with local universities, where we provide the funds for their space-related academic programmes. Universities do not report to us; they operate autonomously. This way, we found we could build a more sustainable ecosystem and fulfil the mandate of our leadership. We just orchestrate the whole thing, if you like."

The UAE Space Agency also engages with bigger entities like MBRSC and Yahsat, though they were established much earlier.

"MBRSC is funded by the Dubai government. They were established in 2006 and have a lot of engineers and the right skills. When we have a project in hand, we look at which organisation is the most capable of executing it and contract them to do it."

The UAE already has seven large satellites in space. Yahsat has three of its own and two from its new acquisition, Thuraya. MBRSC has two satellites and is gearing up for the launch of a third – KhalifaSat – later this year.

Perhaps the agency's most ambitious project to date is its Mars mission, which has various elements to it. The first is the Hope Mars Probe, a spacecraft that will be launched in 2020 and orbit Mars in 2021 to coincide with the 50th anniversary of the founding of the UAE. The second is an ambitious 100-year programme to build a city on Mars.

The third is the establishment of the Mars Scientific City, a $136m project that will simulate life on Mars. Spread over a space of 1.9 million square feet, this city in Dubai will be the largest space-simulation city ever built and will provide a viable and realistic model of living on the surface of Mars. The project encompasses laboratories for food, energy and water, as well as

agricultural testing and studies of food security in the future. The first phase will be ready by 2020.

At present, the focus is on the Hope Mars Probe, which is being launched to study the red planet better in conjunction with other international scientific communities, and share information about its temperature and climate.

As Dr Ahbabi pointed out earlier, the agency looks locally to see who has the expertise to take up one of its projects.

"For this Mars mission, we felt that MBRSC had the skills and the expertise, so we signed a contract with them to do it. Of course, because we are small, I wanted my engineers to learn as well, so they have also gone to MBRSC to work on it."

The person helping with the implementation of this project, or "doing the cooking in the kitchen" as he humorously puts it, is aerospace engineer Khaled Ali Al Hashmi, Director of Space Missions at the UAE Space Agency.

"The Hope project, or Amal, is the first flagship programme for the UAE. This satellite is a 24/7 probe covering the upper and lower atmosphere of Mars; it adds value to other missions that are studying different elements of the Martian atmosphere. We have partnered with the universities of Colorado, Berkeley and Arizona to contribute the sensors for the probe. Three sensors – infrared, ultraviolet and cameras – make up the main instrumentation. We are also collaborating with NASA to track the satellite," says Al Hashmi.

> "We wanted to create a clear road map. With space, you need to have a very clear plan because it is a very costly exercise"
>
> **HE Dr Mohamed Nasser Al Ahbabi, Director General, UAE Space Agency**

He points out that roughly 60 UAE nationals are involved in this project, with 50 engineers from MBRSC and the rest from the UAE Space Agency.

"One thing that we are really proud of is the fact that Tawazun Precision Industries (TPI), a local company, is manufacturing around 65 components for this spacecraft in the UAE. We pre-qualified them in coordination with MBRSC and now they are producing these components. We will do the assembly, integration and testing of the spacecraft. In 2019, we will have completed the full environmental testing of the spacecraft. Mitsubishi in Japan will help launch the vehicle."

Dr Ahbabi is also pleased that "the project is on budget, within the designated weight and on time", which he says is "not typical for a space project".

"All of us are working with certain margins in terms of weight – both the company that is designing the rocket to launch our probe and us. If it's less than the weight planned, it immediately throws open so many options. You can inject more fuel to increase the lifespan of the spacecraft or consider ride sharing for one of your smaller satellites. It's very exciting to think of all the things you can do with your options," says Dr Ahbabi, the excitement vivid in his eyes.

Members gather for the first national workshop held in Abu Dhabi to assess the economic significance of space activities.

Once the probe reaches orbit, a team of university students and the Emirates Mars Mission team will analyse the data received from the Al Amal spacecraft. The probe, however, is only a stepping stone to the UAE's more ambitious dream to set up habitation on Mars in 100 years.

"It may seem hugely ambitious, but our leadership has always made it clear that if you are going to set a goal, set it as high as you can so everybody will compete and there is something worth aspiring to. Mars is not the destination for us. It is the journey. It is what we learn and achieve in the process, how many people we educate, the technology we start developing within the country, the soft power this project will contribute, the cooperation you build with international powers and how much research you would have conducted, and the intellectual property and the patents you would have created in the process.

"That's why this journey is so important," he explains. "It's about building knowledge, confidence, international cooperation, respect and credit for our country through the space agency."

The results are already showing, he says. In late April, students from Abu Dhabi University (ADU), American University of Ras Al Khaimah (AURAK), Khalifa University (KU), University of Sharjah, United Arab Emirates University (UAEU) and New York University – Abu Dhabi (NYUAD) participated at the Global Aerospace Summit 2018 in Abu Dhabi, where they showcased a number of aerospace projects under development at their institutions. Presently, five or six different CubeSat or CanSat projects are under development in universities.

By cooperating with regional and international entities, everyone can benefit, says Nasser Al Hammadi.

"Young people who joined the project and knew nothing about space are now leading and participating in these big conferences and discussing their science objectives. You can't buy that knowledge. You have to go through a long-term project like this to build that. We would have also gained the respect of the international community. When they see someone from this region at this difficult time coming up with these ideas like a torch in the darkness, they will join you," Dr Ahbabi says.

> The UAE Space Agency has built ties with more than 25 national and international stakeholders and partners across the world since 2014"
>
> **Nasser A. Al Hammadi, Head of Space Policy**

And the proof is in the international deals that the agency has recently inked with the most influential space players. Nasser A. Al Hammadi, Head of Space Policy, who is responsible for developing those relations both regionally and internationally, says the agency "has built ties with more than 25 national and international stakeholders and partners across the world since 2014".

Among its many deals, the UAE Space Agency has recently signed separate letters of intent with both Russia and NASA for the UAE Astronaut Programme. The country completed a massive hunt for its first four astronauts earlier this year, and of the 4,000 applicants, nine have qualified for the final round. This month, the agency is likely to announce the chosen four and the first astronaut among them, who will represent the country.

"We have a Letter of Intent with Russia to take the first Emirati astronaut to space. Our first astronaut is scheduled to reach the International Space Station in April 2019. We have also signed an agreement with NASA that covers cooperation in the peaceful exploration of outer space and our astronaut programme. This agreement also allows us to share the space NASA has on ISS. We work with all nations across the world. We have picked our advisory committee as well from different countries, because they bring different levels of expertise and perspectives," explains Dr Ahbabi.

The UAE Space Agency is simultaneously working with UAE universities to ensure that students remain an integral part of its space initiatives. The agency has encouraged individual contributions and collaborations between universities while also empowering them to get involved in manufacturing some of the components.

"We established a centre at Masdar and another at Sharjah University, and we try to work within their mandates as academic institutions. If we want to create a small satellite of less than 50kg, we approach Masdar. For a satellite that is between 50kg and 200kg, we approach the UAE University in Al Ain. A bigger satellite of 500kg or more will be handled by MBRSC. When it comes to astrophysics or science, Sharjah comes into the picture."

In response to the question of whether universities will collaborate to produce a better product, Dr Ahbabi says this is controlled through funding: "When we put out a proposal, we always say that the chance of them winning the opportunity to do it is greater if they collaborate."

As a result, Masdar Institute

Participants at the Mars Summer Camp held last month in Australia by the agency, in collaboration with the Mike Roach Space Education Centre.

of Science and Technology, part of the Khalifa Institute of Science and Technology, and AURAK are presently working on developing a 3U CubeSat called MeznSat to study the Earth's atmosphere. The satellite is to be launched in late 2019 from a site in Japan, in coordination with the Japan Aerospace Exploration Agency (JAXA).

Once in orbit, the students will monitor, process and analyse the data from a ground station in the UAE. The processes and expertise involved in monitoring the atmosphere are similar to those employed during conventional Earth observation programmes.

"This CubeSat will measure the abundance and distribution of methane and carbon dioxide in the atmosphere. It will help them to study the concentration of nutrients in the coastal waters of the Arabian Gulf, and make more accurate predictions of algal blooms," explains Dr Ahbabi.

KU is working with NYUAD on another satellite project.

The UAE also recently signed the Paris Declaration to address climate change, so these satellites are being used for Earth observation, climate change and similar scientific initiatives.

A larger 150kg satellite is also being developed between the UAE and France as part of the Paris Declaration, says Al Hashmi. "This is a hyperspectral satellite for remote sensing and is the first in the region. It will help us to understand the terrain and the vegetation in this country better."

The agency is also working closely with an organisation to learn how to analyse the data from the various satellites it is launching into space, and ensuring universities are involved in this exercise.

"We are building the capabilities at local universities at various levels," explains Al Hashmi. "We are also funding local universities to build certain technologies like navigation controls, computers, GPS receivers and so on. We are building those capabilities so that in the future, the main components of the satellite can be built in the UAE."

This collaboration with various entities within the country has helped the nation develop its space activities exponentially. As a result, regional and international agencies as well as scientific organisations are looking to the UAE to collaborate and partner on various initiatives.

For instance, as Bahrain looks to begin its own space initiative, it has invited the agency to help it identify a few engineers to helm it. In addition, Nasser A. Al Hammadi, Head of Space Policy, points out that HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, has asked the agency to step up collaboration within the Arab region.

"His Highness called for us to get closer to our neighbours and share our expertise so that everyone can benefit from it."

Although space activities are still minimal within the GCC, Algeria already has a space agency and Morocco has remote earth sensing capabilities.

"Everyone has different levels of expertise, and we are trying to bring all of them together so we can tap into each other's expertise and benefit mutually," explains Al Hammadi.

In the meantime, the UAE is also drumming up support internationally and has most recently entered into a number of partnerships within Latin America.

"We have recently established partnerships in Argentina and Brazil as well. The programme we have today is very ambitious and aggressive. Our goal is to connect with everybody on a regional and international level," Al Hammadi adds.

One aspect that remains crucial is space regulation, and the UAE is also in the process of finalising its national space law.

"Our national space law will discuss the regulation of human space flights, space mining and space tourism. It will be a state-of-the-art space law that will come out before the end of the year," says Dr Ahbabi.

He is clear about one thing.

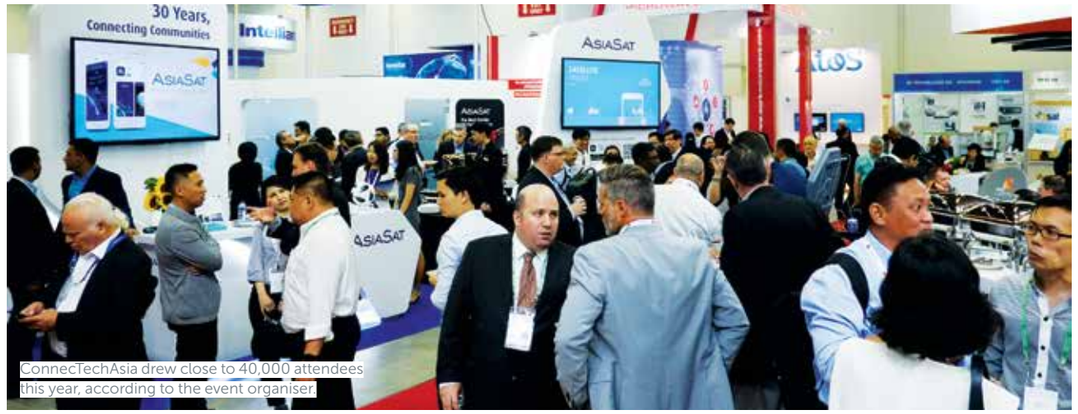
"If you want sustainability, you have to get everyone involved and, more importantly, you must get the private sector to step in. This is why we are trying to establish local centres while also working with a number of countries like Russia and Kazakhstan for space investment."

So far, 500 UAE nationals are involved in the country's space programmes, 50 at the UAE Space Agency. "I call them the dream team. We want the UAE Space Agency to remain a government entity while operating with the agility of a private entity. We are also here to ensure that our space initiatives create a sustainable knowledge-based economy and simultaneously help raise the profile of the UAE internationally. There is no better project than this to do that." PRO

> "We knew that we wanted to be a dynamic organisation that could move quickly with our ideas and we wanted to be like Space 2.0 – very active in the commercial aspect of space"
>
> **HE Dr Mohamed Nasser Al Ahbabi, Director General, UAE Space Agency**

CONNECTECHASIA – IT'S A WRAP

From cloud and blockchain to AI, VR, IoT, 5G, IP broadcasting and OTT, ConnecTechAsia brought a host of innovations to the fore



ConnecTechAsia drew close to 40,000 attendees this year, according to the event organiser.

ConnecTechAsia, the inaugural mega technology event comprising BroadcastAsia, CommunicAsia and the new NXTAsia, covered the latest innovations in cloud, blockchain, AI, VR/AR, IoT, robotics, 5G, IP broadcasting, OTT and smart cities, among others.

Under the new brand, ConnecTechAsia this year drew close to 40,000 attendees from 96 countries and 1,800 exhibitors from 52 countries. Emerging technologies and digital disruption were trending topics, amid the convergence of the telecoms, media and technology (TMT) industries in an evolving business landscape.

"We are pleased to hold the first edition of ConnecTechAsia, which has a renewed format for a more immersive experience with insightful sessions and displays for our attendees that reflect the latest industry trends and technologies that are impacting governments, cities and businesses. We hope that the many partnerships and friendships forged will serve as a foundation for an even more diverse ecosystem and empower Asia as it evolves digitally," commented Victor Wong, Event Director for ConnecTechAsia, UBM.

The Asia-Pacific region today accounts for 44% of global GDP and its shift towards digital is powering the region towards a new era of economic growth and redefining the region's social landscape.

Echoing this, Paul Marriott, Senior VP of Digital Core Solutions, SAP, and ConnecTechAsia Summit speaker, said: "ConnecTechAsia has been a great platform for us to build key relationships with governments and global businesses to foster greater collaboration and innovation."

Using ConnecTechAsia as a gateway to the region, the exhibition saw several Asian launches. PepperStack Global, with the support of the government of Victoria in Australia, launched its new NeatStreets Around Me and Micro-compensation feature sets into the Southeast Asian markets, which allow the public to serve as "human sensors" and report on safety-related matters using their mobile devices, enhancing the uptime and efficiency of public utilities.

Forsway, a Swedish technology provider, announced the launch of the new Odin F-50 hybrid satellite router to the Asian market, which combines mobile networks with satellites to enable operators to provide highly affordable broadband internet to consumers in regions lacking reliable internet access.

AsiaSat announced a collaboration with KBZ to provide OTT satellite video service in Myanmar, enabling audiences across the country to enjoy video content and TV programmes even in rural areas or while on-the-go on trains or planes.

The inaugural Thailand Connect seminar, co-organised with Thailand's Digital Economy Promotion Agency (DEPA), saw the announcement of five core themes that are a focal point for the Thai government: big data, digital manpower, cybersecurity, income inequality gap and digital transformation 4.0, which will enable businesses for digital transformation in the next stage of economic growth.

Nagra had a big presence at the show and spoke extensively about the need to protect the entire value chain all the way from the beginning to the end.

"We take the entire value protection challenge seriously, and we go beyond simple CAS and DRM management to give our client complete control of content protection across all their networks, devices and use cases," commented Ivan Verbesselt, Senior VP of Group Marketing at Nagra Kudelski.

He also spoke about Nagra's OpenTV Signature Edition, providing a comprehensive, cloud-based and always-evolved pay-TV video ecosystem to help build a better video business.

> "IoT is revolutionising our world, and today it is at the ... intersection of affordability and availability, thus driving innovation"
> **Pawan Gandhi, Founder & CEO of KaHa**

"The OpenTV Signature Edition is multi-generational and helps accommodate different journeys, because some want a straightforward experience while others want a more exploratory journey," Verbesselt added.

The OpenTV Signature Edition enables a fully personalised video entertainment experience by optimising linear and on-demand content and catalogue services.

Newtec showed how it is taking the 5G journey forward.

Hughes Broadcast commented that the main message in 2018 is that HTS has finally arrived in full force in the APAC markets. Dave Rehbehn, VP, International Division, Hughes Network, commented that the company has the technology and the platforms to enable HTS.

Iridium made a splash at the show, claiming its unique meshed network architecture of six networks with 11 satellites each provides the most reliable and strongest signals for communication.

London-based Kino-mo showcased its new HYPERVSN solution, a high-tech retail display that generates holographic 3D visuals of products that are true to life and appear to float in the air. Kino-mo also signed four agreements at the show.

ST Engineering and SP Group announced Singapore's first pay-per-use IoT-as-a-service platform trial, which will enable organisations to move into the IoT space and bring their services faster and closer to their customers without costly investment in infrastructure, connectivity and data analytics.

KaHa, an end-to-end smart wearable technology company, also showcased solutions that use IoT extensively. "IoT is at the favourable intersection of affordability and availability, thus driving innovation," noted Pawan Gandhi, founder & CEO of KaHa and Summit speaker. PRO

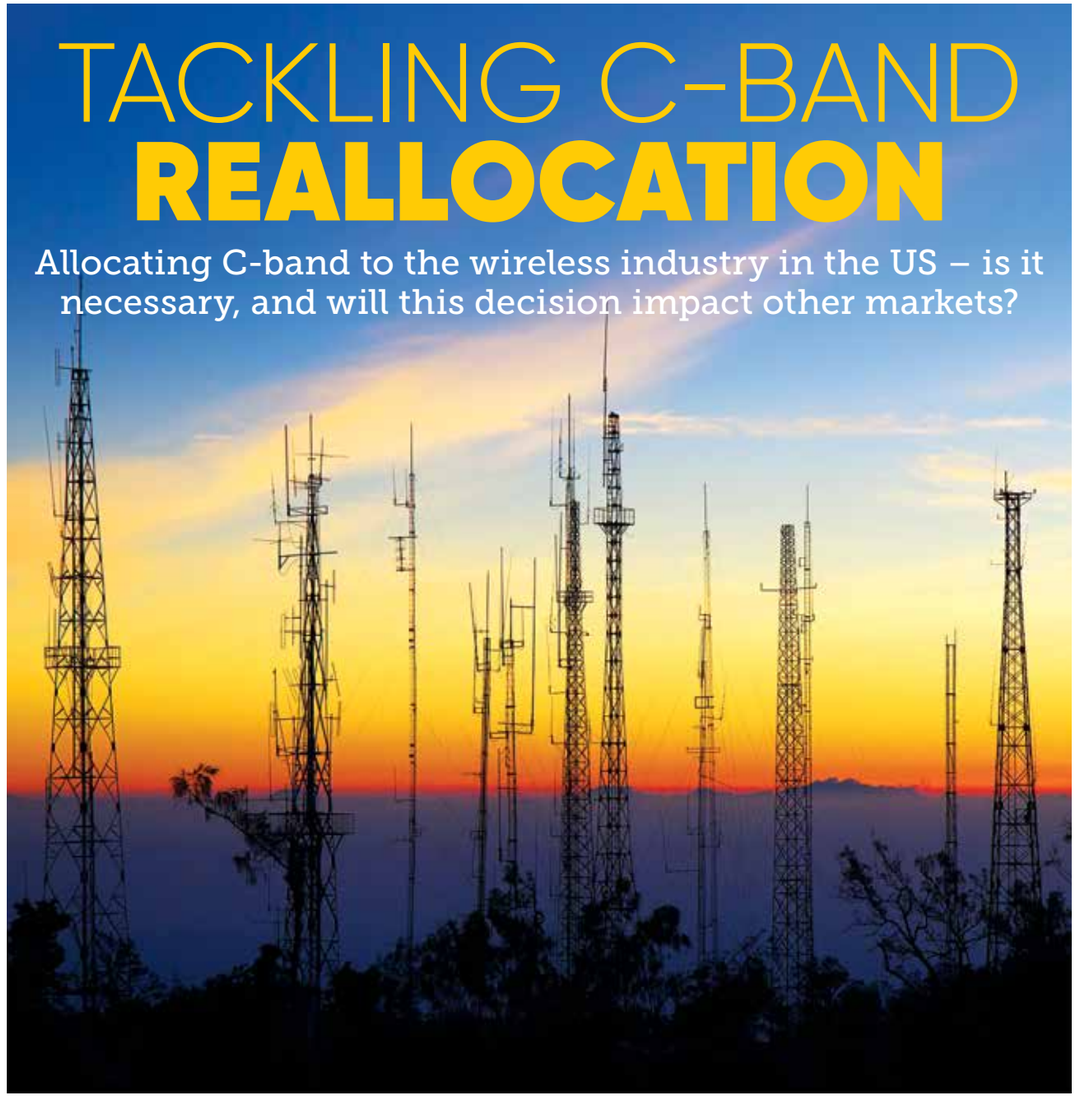
ConnecTechAsia will return for its 2019 edition from 18-20 June at Marina Bay Sands and Suntec in Singapore.

Dave Rehbehn, VP, International Division, Hughes Network, says HTS has finally arrived in APAC.

Ivan Verbesselt, Senior VP of Group Marketing at Nagra Kudelski, says the OpenTV Signature Edition accommodates different multi-generational journeys.

TACKLING C-BAND REALLOCATION

Allocating C-band to the wireless industry in the US – is it necessary, and will this decision impact other markets?



A recent proposal from the US Federal Communications Commission (FCC) aimed at giving the wireless industry access to C-band, which commercial satellite operators have long used to deliver cable and broadcast network programming, was received with mixed feelings. The proposal is said to have been initiated by Intel, Intelsat and SES. In July, Intelsat, SES and Eutelsat announced that they are aligned on the proposal to establish a commercial and technical framework to enable terrestrial mobile operators to quickly access spectrum in the 3,700-4,200MHz frequency band in the US, to expedite the deployment of next-generation 5G services. *Vijaya Cherian* spoke to stakeholders on both sides to hear their views on the recent ruling in the US and if it is likely to affect other markets that use C-band extensively.

Intelsat


Hazem Moakkit, Intelsat VP of Spectrum Strategy

For at least the past decade, Intelsat and other satellite operators have been defending C-band from encroachment by mobile network companies who want to take over that spectrum to expand their services. So when we announced a collaborative proposal with Intel (later joined by fellow operators SES and Eutelsat) that clears some C-band spectrum in the US for use by wireless 5G providers, other satellite operators, particularly those outside the US, wondered if we had inexplicably switched teams mid-game.

Nothing could be further from the truth. Intelsat has not changed its view on the importance of protecting satellite operators' ability to deliver reliable, quality services to C-band customers. There is no room for compromise when it comes to the quality satellite transmissions needed by customers. We are the leading advocate that the services delivered in this band are crucial for media distribution and other essential data services in the US. We've successfully lobbied globally for C-band protection for over a decade.

The proactive stance of our US proposal was a direct response to an increasingly menacing regulatory landscape there. The MOBILENOW Act and AIRWAVES Act introduced by US legislators suggested complete reallocation of C-band services to wireless, or shared use with other unlicensed services. Additionally, public statements by FCC officials made it clear that the C-band environment will not remain the same.

When the FCC asked for recommendations from the industry on how C-band spectrum could be shared by the wireless community to accelerate the deployment of 5G in the US, we came forward with a proposal that preserves the satellite ecosystem in the band, while addressing the strategic objectives of the US government with respect to 5G leadership. With our proposal, satellite operators can continue to deliver the highest quality service to our media and telecommunications customers in the US.

However, we don't think that the pressure on conventional C-band (3.7-4.2GHz) in other parts of the world is as intense as in the US, for two primary reasons:

1. The US Table of Frequency Allocation differs from that elsewhere. The rest of the world has already identified the 3.4-3.6GHz band (and in some cases 3.4-3.7GHz) for mobile use. In contrast, 3.4-3.7GHz in the US is allocated to federal use and to the new Citizens Broadband Radio Service.

In other words, the rest of the world has already made a significant amount of mid-band spectrum (200-300MHz) available for mobile use; this was not an option available to the FCC, so all eyes were on the conventional C-band.

2. Many countries rely heavily on C-band infrastructure to support social and welfare programmes, and thus have a regulatory posture much more favourable to FSS. In much of Asia, South America and Africa, C-band is relied upon for a broad range of services, and the intensity of usage is arguably much greater than in the US. Rain patterns and other factors have resulted in significant deployments of C-band services for vital communications and video transmissions by national/government-affiliated organisations, as well as commercial satellite operators. Therefore, governments are unwilling to compromise their ability to deliver these fundamental services to citizens. This makes the situation much less conducive for reallocating conventional C-band to mobile in these regions.

> "The rest of the world has already made a significant amount of mid-band spectrum available for mobile use; this was not an option ... to the FCC, so all eyes were on C-band"
>
> Hazem Moakkit, Intelsat VP of Spectrum Strategy

But let's not lose sight of the big prize: 5G promises to generate incredible growth in the economies where it is deployed, benefiting satellite every step of the way. The satellite industry, with ground and space assets that last decades, is defined by its ability to envisage the future. Throughout our history, the satellite industry has demonstrated time and again resilience, adaptability and flexibility. Our entry into the 5G era should be no exception.

Our US-focused proposal recognises that the fast-moving technology and regulatory landscape does not work well with one-size-fits-all solutions. It is tailored to the unique US environment and to respond to the US government's strategic objectives of maintaining 5G leadership. Our proposal should be viewed solely through that lens.

MEASAT

Dr Ali R. Ebadi, Advisor to Board of Directors, MEASAT.

Gradually, the satellite spectrum is being taken and reallocated to the mobile business. The issue with the FCC is that they want to allocate another 100MHz to mobile from the 3.7-3.8GHz band, and also have access to the entire C-band in the future. Satellite users of this band must migrate and move out to other bands.

We are gradually giving our spectrum away to mobile businesses. At the end of the WRC (World Radiocommunication Conference), while agreement has been obtained internationally, regulators can regulate for their respective countries without needing international recognition. Korea, Japan and other leading mobile countries are in favour of the C-band spectrum and they will purchase this band.

> We are gradually giving our spectrum away to mobile businesses"
>
> Dr Ali R. Ebadi, Advisor to Board of Directors, MEASAT

Mobile operators have access to the 800-2,000MHz range and other spectrums as indicated in the Radio Regulations. The existing allocation of C-band to satellite usage should not be compromised, and vast numbers of users of C-band in Asia, Africa and South America with tremendous investment in the infrastructure should not be disturbed. Under agenda item 1.13 of WRC 19, mobile operators are requesting more than 30GHz allocations and even using up to about 80GHz frequencies. This means they do have the technology to operate at higher frequencies. So we do not know why they are clamouring to grab our satellite spectrums.

Europe and Africa have agreed to use 3.4-3.6GHz for mobile applications. Under the current ITU regulations, usage of the 3.4-3.7GHz band by certain countries in Region 3 of ITU (Asia and Asia Pacific) is subject to certain technical limitations and requires agreement from countries using these bands. Satellite operators should work together by lobbying through their administrations as well other organisations such as CASBAA and APSCC to protect the satellite C-band.

SES


Christophe De Hauwer, Chief Strategy and Development Officer, SES.

Satellite C-band frequencies are critical for broadcast and data services and underpin the economy, society and security of many parts of the world. In Asia, billions of dollars have been invested by SES and other operators to develop C-band capacity; state-owned satellite operators have followed suit with significant C-band investments, and customers have spent millions on ground equipment. The result: a highly efficient, highly reliable ecosystem whose reach is unrivalled by any other technology.

Recently, the FCC indicated its intention to reallocate a portion of the standard C-band (3.7-4.2GHz) for terrestrial 5G. This is driven largely by the fact that the US Table of Frequency Allocations is different from that of most of the rest of the world. While most of the world can use the 3.4-3.6GHz band for terrestrial 5G, the US cannot because government radars operate in that band.

At CASBAA SIF 2018, some Asian satellite operators expressed concerns that other countries might follow the US approach. While we see some pressure to reallocate the standard C-band in other parts of the world, we do not think it necessary for other countries to follow the US, especially when the lower C-bands remain unassigned and could be readily available for terrestrial 5G. Policymakers in other countries must also fully consider the local context of C-band use in their country, including different market conditions, geography and weather.

Additionally, due to heavy rainfall in Asia, C-band is the most reliable communications option and is often used in vital government and back-up systems.

> Billions of dollars have been invested by SES and other operators to develop C-band capacity"
>
> Christophe De Hauwer, Chief Strategy and Development Officer, SES

AsiaSat


Dr Roger Tong, CEO, AsiaSat.

Numerous field tests and practical experience have demonstrated that it is not feasible for IMT and fixed satellite service (FSS) to coexist in the C-band downlink bands (3.4-4.2GHz) within the same geographical area. C-band is used for a multitude of services in Asia and around the world. It provides basic lifeline connectivity to rural and remote areas, and plays an essential role in the socio-economic development of many developing countries. It is also used for mission-critical operations such as disaster recovery.

> Consultation ... and developing 5G systems at the right spectrum range will facilitate the coexistence of mobile service with the existing satellite industry"
>
> Dr Roger Tong, CEO, AsiaSat

The C-band spectrum is crucial for backbone distribution of news, sports and entertainment. It is more resilient to rain fade and so is better able to offer reliable services to the rainy regions that contain the majority of people in the Asia Pacific region. Though an administration has the sovereign right to decide what service to deploy within its own territory, we call for proper consultation, planning and collaboration to protect the incumbent satellite operators, with mitigation measures including frequency selection and planning shielding both sides.

Nevertheless, we are of the opinion that alternate spectrum available, such as the millimeter wave (Mm wave) and extremely high frequency (EHF, mainly above 30GHz) bands offer much better opportunities to support the spectrum-hungry 5G mobile service for high data rate and lower latency applications. Performing the right consultation and developing 5G systems at the right spectrum range will facilitate the coexistence of mobile service with the existing satellite industry, and would be a win-win solution for all stakeholders.

APSTAR


Chen Xun, Executive Vice President, APSTAR.

40% of our revenue comes from video. C-band is of paramount importance in Asia for video broadcasting and satellite communications, which are less affected by rain compared with other frequency bands. We currently operate many C-band satellite transponders. Indonesia has around 17,000 islands and they rely heavily on C-band even for 3G cellular backhaul.

The 3.4-3.6GHz frequency band (extended C-band) has been allocated to 5G in many regions, and 3.7-4.2GHz (standard C-band) is allocated to fixed satellite services by ITU; however, according to the Intelsat/Intel/SES C-band Spectrum Solution Proposal to the FCC, part of standard C-band should also be allocated to 5G in the US. This is a big concern and sets a bad example for those using C-band. This allocation will be a big blow for the broadcast industry.

> As 5G and satellite services cannot coexist in this band, the implementation of 5G base stations will cause interference and wipe out satellite services"
>
> Chen Xun, Executive Vice President, APSTAR

As 5G and satellite services cannot coexist in this band, the implementation of 5G base stations will cause interference and wipe out satellite services. Intelsat, as an satellite industry leader, should not allow that. Standard C-band must continue to remain with satellite players. We have fought for so long to have it remain with us. Intelsat and SES control 90% of the C-band in the US and they are in favour of 5G and can influence international C-band allocation. PRO

MAINTAINING THE VALIDITY OF SATELLITE FOR BROADCASTING

Satellite still remains the best method of providing the highest quality content reliably, and it's this trump card that will enable it to compete with OTT, says Andrew Bond of ETL Systems

As viewers demand content everywhere at any time, eschewing linear viewing in place of the widespread adoption of OTT services, some suggest that satellite for broadcasting is moving towards its demise. While it's true that fibre, OTT and other internet-based distribution methods have caused the satellite industry to lose some of its market share, rumours that satellite has had its day are not strictly true.

The high demand for live events and sport is great news for the satellite industry. There's no way of ensuring reliable and quality coverage of live events without satellite. Of course, the dependence of 4K OTT content on fast internet speeds also plays into the hands of satellite, since even areas of the UK struggle to reach the required speeds needed to stream 4K perfectly.

Spot-on Quality

OTT is undoubtedly piling the pressure on broadcasters. To maintain the attractiveness of satellite in the face of this competition, it's important that broadcasters ensure that viewers at home get a high-quality feed resilient to outages. This way, satellite broadcasting continues to offer something which OTT and other internet-based service can sometimes fail to provide.

At the same time, the responsibility for maintaining a quality viewing experience doesn't just lie with the broadcaster. It's up to the entire satellite industry (manufacturers and operators alike) and all those with a stake in the satellite broadcasting sector. After all, when a consumer experiences a poor-quality broadcast, it not only encourages that one consumer to move away from satellite services, it can cast doubt over satellite broadcasting as a whole.

Of course, it's not just consistent quality that satellite can offer. In April this year, a report from Futuresource Consulting predicted that consumer demand for TV sets would return to growth of 5% in 2018, boosted by 4K ultra high definition (UHD). I see this trend reflected in the satellite industry too, with demand for 4K content pushing the popularity of satellite services. This is because satellite is well capable of coping with the high bandwidth required by 4K, whereas streaming this content usually requires internet speeds of around 25Mbps. This is pretty significant when we consider that the BBC recently reported that the average broadband speed in the UK is 18.5Mbps.

With all this talk of the death of satellite, it's easy to forget that satellite is still the most relevant choice for broadcasting popular events. When a signal needs to go to 100 broadcasters at the same time, for example, satellite is always the most cost-effective way of doing so. Just one SES satellite, Astra 3B, currently carries 243 channels, reaching a huge 35 million households. This doesn't even take into account the importance of satellite for broadcasting live events and sports, which almost completely relies on satellites like Astra 3B.

Connected Everywhere

For one, live sport and breaking news aren't well suited to the OTT viewing experience. This is due to the demand for immediate coverage and little to no latency, as well as social factors in the case of sports viewing. It's difficult to imagine satellite becoming irrelevant with such high demand for sport and other live events to be made available to viewers unable to attend.

In the case of live sport, particularly long-distance events or those based in a rural location (rallying or cycling races for example), not many other distribution methods can provide the required level of reliability. Broadcasters spend billions of pounds for the rights to some popular sporting events; imagine the disruption if a feed was suddenly cut off or became unwatchable. That's not to mention that consumers pay a lot for satellite TV packages that include access to this sports content. Any disruption or even minor latency could prove seriously detrimental. With satellite, sports rights holders know a feed is reliable, cost-effective and offers viewers the best possible quality.

> "In the case of live sport, particularly long-distance events or those based in a rural location, not many other distribution methods can provide the required level of reliability"
>
> Andrew Bond, ETL Systems

News events are rarely predictable. Despite the fact that we live in an increasingly connected world, news reporters can't always rely on there being a fibre connection installed at every breaking news site. This is particularly the case in remote locations, where satellite remains the only option.

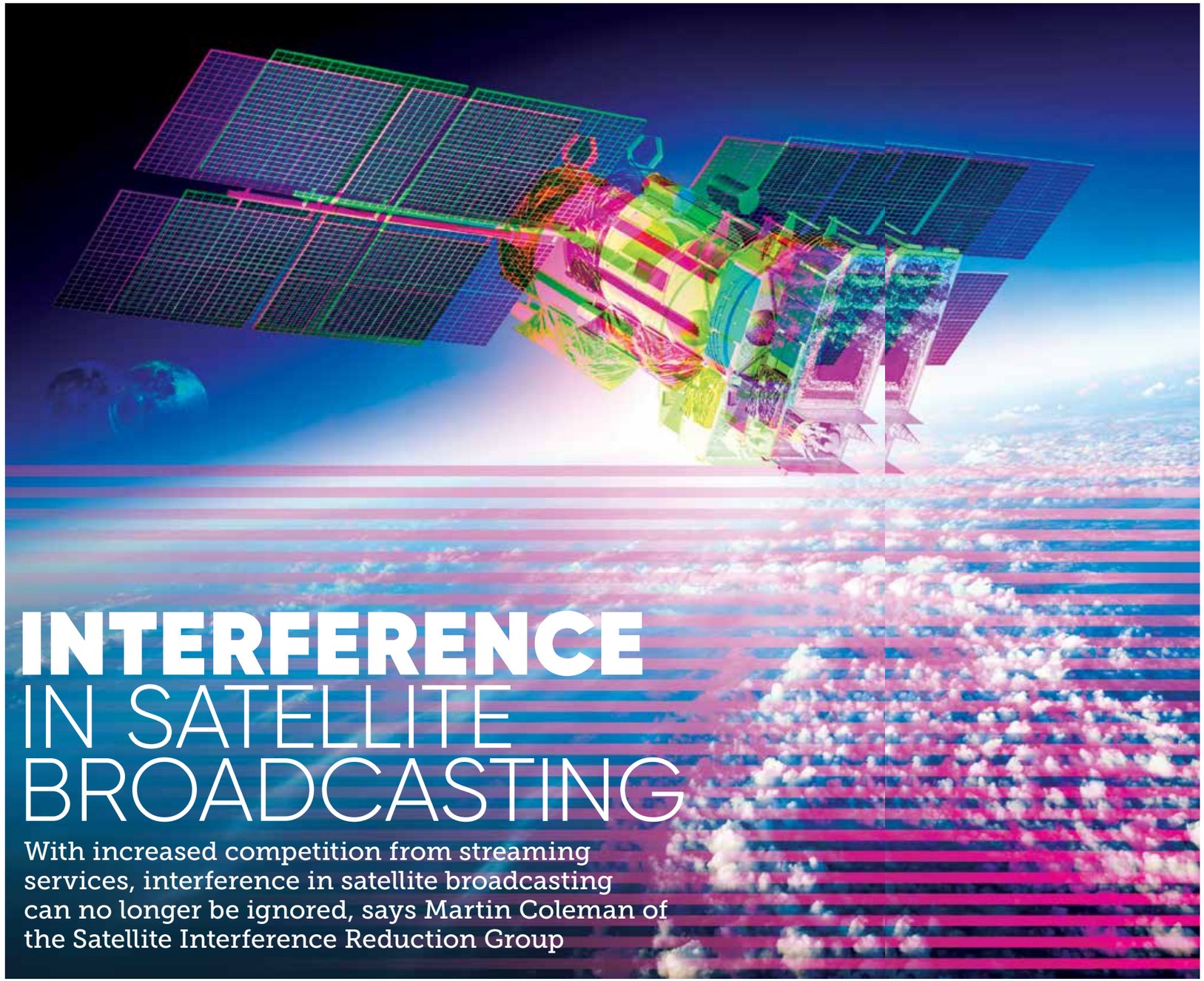
The problem for the satellite industry is that outside broadcast (OB) relies on very small aperture terminals (VSATs). These are cheap and quick to install, but almost everyone working with them admits they are a cause of many problems and transmission errors. It's absolutely essential that we don't allow errors caused by VSATs to threaten the validity of satellite broadcasting. Luckily, many of the problems pertain to poorly made equipment and components, which is at least easily solvable by investing in properly manufactured equipment.

It actually makes more cost-effective sense to invest in quality equipment, especially for moving parts like amplifiers, attenuators, block up converters, couplers, etc. That's because the added cost of better quality equipment is offset by spending less time and resources solving VSAT problems. Broadcasters are under increasing pressure to keep subscription costs low (partly because of OTT), so operational costs must also be kept to a minimum. Satellite operators that invest in the right equipment can keep errors to a minimum. In turn, this means less expenditure of resources, meaning they can keep the cost of services low and reliability high. That's a win-win for everyone.

Conclusion

There seems to be a misconception surrounding satellite that it is a legacy technology and won't keep up with the pace of change. In actuality, satellite is a highly innovative industry which is constantly developing solutions to problems around the world. It's the satellite sector which developed auto-pointing antennas to solve the problem of unskilled employees incorrectly setting up VSATs, for example. Without doubt, satellite will remain relevant, an opinion reflected by a report from Northern Sky Research, which points out: "It is sometimes easy to forget that video markets remain the single largest driver of satellite revenues worldwide, and are expected to continue to do so moving forward." PRO

Andrew Bond is Sales and Marketing Director of ETL Systems



INTERFERENCE IN SATELLITE BROADCASTING

With increased competition from streaming services, interference in satellite broadcasting can no longer be ignored, says Martin Coleman of the Satellite Interference Reduction Group

For broadcasters, satellite interference can seem like a thorn in the side. It's always there niggling away, but it's not something that usually causes major disruption or is worth worrying about. Interference is seen as a satellite problem, and not something broadcasters can tackle easily. But interference becomes much more than just a nuisance if it hampers the provision of content to consumers, especially with increased competition from OTT providers.

This is not bad news, as several measures are already in place on the satellite side of the fence to ensure the validity and reliability of satellite broadcasting. In some ways, it's these measures that make broadcasters feel safe in their assumption that interference isn't a big problem. So where does the broadcast industry currently stand in relation to interference, and where does it go from there?

The Current State of Interference

Solutions that have proved successful in the past haven't been designed to work long-term. For example, satellite operators have long been simply moving broadcast customers to different spectra to solve interference issues in the short term. This means we gradually end up with scattered amounts of unusable bandwidth, as well as doing nothing to consider how we could prevent interference in the long term.

The inception of Carrier ID (CID) has helped. For one, it is great that satellite manufacturers were able to come together towards a common goal, but we still struggle to encourage users to fully adopt CID or simply switch it on! It is already in all modems and modulators, but very often it is shipped with CID switched off. Many broadcasters are not aware of CID or even realise that it needs to be activated, so there is still work in progress here.

Low budgets also counteract the ability for broadcasters to embrace CID. There is a reluctance to invest in new CID-enabled equipment when existing infrastructures are still operating well. And, of course, broadcasting is changing with IP and the use of VSATs.

These changes in broadcasting have naturally led those tackling satellite interference to rethink the mitigation strategy. For OB, VSATs are now essential, but they have been responsible for causing an unparalleled percentage of interference. Statistics aired at last year's IRG Annual Workshop neared 40%. OB services can include breaking news, live events and sports. It's imperative that these remain error-free, not only so that broadcast customers are satisfied, but also so that the validity of satellite bandwidth is maintained.

Poor equipment is a big cause of problems with VSAT. The terminals themselves can be cheaply made, as they are designed to be quick to deploy and cost-effective, but the result is often more errors in the long run. Broadcasters must ensure they always invest in the best quality equipment to avoid this issue.

Another issue with VSATs is human error. Broadcast personnel do not always have the specialist satellite knowledge required to operate equipment. On top of this, in the OB environment it is common to see only two people, or even one, responsible for the entire operation. As a result, there is a lot of pressure on these multi-skilled employees, which can often lead to more errors.

Over the last five years and on the back of CID, manufacturers have been developing a range of new tools for VSAT operations and management, which have proved

effective when integrated into broadcast operations. Particularly useful for correct installation of VSATs, these tools can monitor for issues and auto-point antennas, for example, as well as now being able to quickly find any VSAT terminal that may be causing problems, regardless of the size of the operating network.

A Competitive Future

Broadcasters are facing a challenging environment, with increased competition from streaming services and tightening budgets. With a desire to keep operational costs low, it's no wonder interference isn't at the top of their to-do list.

At the same time, though satellite broadcast providers shouldn't be too worried about the so-called death of satellite, they should at least be prepared to put some measures in place at their end to ensure that services offer reliability and quality. This relies on preventing disruption caused by interference.

For broadcasters, entire operations rely on resilient transmissions – if there's any disruption, it can mean two things:

- A bad user experience for consumers
- Potential loss of revenue from interrupted ads

Particularly for live sports, events and breaking news (which still rely almost solely on satellite), any disruptions can have serious consequences on the overall business operations of the broadcaster.

While interference may not be a big enough problem, the consequences of even the smallest amount of interference are much more significant than they were when satellite broadcasting dominated the market.

An AI Collaboration

The satellite industry has always innovated to stay relevant; you only need to look at the amazing applications it enables across the globe to see this. The broadcast industry is much the same, having evolved significantly since the inception of broadcast television.

Having said this, artificial intelligence remains relatively unexplored in the satellite industry, especially when we consider the breadth of advancement the technology has enabled in other sectors. The broadcast industry, on the other hand, is awash with talk of AI-enabled processes, from content management to network optimisation. This poses the question: could we both work together to explore the potential for AI to solve the issue of interference and for more efficient management of our ever growing and complex networks?

AI and machine learning techniques have the potential to improve processes and efficiency, and possibly completely remove the likelihood of interference incidents. Furthermore, as the learning process gathers knowledge over time, the more precise characterisation of a problem means decision-making and predictive processes become more accurate. It is likely that incident management will speed up by augmenting this new process with automated systems and tools. It will also be interesting to see if deliberate interference can be avoided before it happens, using our collected data and adding both commercial and political trending to this specific scenario.

Interference will probably always be a problem, but if we can get better at spotting patterns of occurrences, we will be able to resolve them more quickly using technology.

The current state of interference, in general, is positive. Our members are constantly developing tools and methods to limit the disruption caused by interference, but we in the satellite industry need to work more closely with those in the broadcast space to find real, workable solutions for the long term. AI could be one major solution, so I'm excited to see where it takes us.

Going forward, we would like to get broadcasters to the table. That way, they can better communicate what tools and technologies they really need from the satellite industry to improve operations and prevent incidences of interference in the first place. Collaboration is the key to the successful future of satellite broadcasting. PRO

Martin Coleman is Executive Director of The Satellite Interference Reduction Group

> "Interference will probably always be a problem, but if we can get better at spotting patterns of occurrences, we will be able to resolve them more quickly using technology"
>
> **Martin Coleman, Executive Director, The Satellite Interference Reduction Group**

ELCOME MAKES A SPLASH

No ecosystem today is complete without connectivity and on-demand entertainment, and yet this continues to remain a challenge for the maritime industry. Dubai firm Elcome tells **SatellitePro ME** about its plans to bring a new wave of connectivity and entertainment to those at sea

Always-on connectivity and entertainment on demand, often taken for granted on land and air today, is still a luxury on ships at sea. However, with the launch of several small satellites and lower-Earth orbit constellations, always-on connectivity and broadband availability are looking more promising for the vessels of the future.

Dubai systems integrator Elcome, which will celebrate its 50th anniversary in 2019, is one of the first players in the market to aggressively pursue an entertainment and connectivity solution for the maritime industry.

"We are one of the few companies in the world that provide a full turnkey infrastructural and technology installation for any type of vessel, and connectivity is one element that we have been focusing on in the last eight or nine years, as it is becoming increasingly important," remarks Jimmy Grewal, Executive Director at Elcome.

"Connectivity and crew welfare have become beneficial. If you can provide that connectivity and entertainment, it's a huge attraction for crew to join a vessel," he points out.

Grewal, a software engineering graduate who worked on developing Internet Explorer at Microsoft before he joined his father's business at Elcome, says his job at the US tech giant helped him understand bandwidth consumption and some of the pain points around it.

With high demand in the market and the right leadership, engineering and strategic skills to address the requirement, Elcome decided to give connectivity its due attention. Today, the systems integrator is working closely with Global Eagle Entertainment, a major solutions provider in the aviation sector, to provide an enhanced entertainment experience to the maritime industry.

Global Eagle touts an entertainment solution called Ocean Prime TV, which is still quite nascent with just five channels in the bouquet and a high premium attached.

Elcome hopes that together, the two companies will be able to develop a solution that includes a much bigger bouquet at a much lower price.

"We will have a substantial offering ready by 2020," says Asneed Ameer, Deputy Manager at Elcome.

The company has already been bundling connectivity packages on some of its clients' vessels and has seen an unprecedented escalation in demand.

"Around 10 years back, people only wanted standard voice call and email. Today, vessel owners want 4Mbps, 8Mbps or more. In fact, crews only want to join a vessel if they have TV or internet on board. We had started by giving some ships 120MB a month, which was huge then. We slowly moved that to 500MB. More recently, we provided a customer with 4GB but that soon became insufficient. Now, we are providing between 6GB and 8GB each month to crew members on some vessels," explains Ameer.

> "Connectivity and crew welfare have become beneficial. If you can provide that connectivity and entertainment, it's a huge attraction for crew to join a vessel"
>
> **Jimmy Grewal, Executive Director, Elcome**

However, he cautions that connectivity is not as straightforward at sea as on land. To ensure that crew usage does not interfere with connectivity for operations or third-party service providers, Elcome allocates connectivity to address three separate requirements.

"Our connectivity solutions are split into three – high-priority network for corporate and operations; the second for crew; and the last as a third-party network for machine-to-machine communication. This way, we ensure that crew usage of data does not impact operations or third-party services. We monitor crew usage, analyse the data and share that with the owners so they know how to allocate bandwidth. We are constantly looking for solutions that don't harm the network while trying to give people a solution that works for them as well," explains Ameer.

But crew welfare is only one aspect of connectivity, Grewal adds. Others need to be addressed to ensure that the vessel can sail safely. Engine, propulsion and other electrical systems, for instance, are significant, and therefore all new vessels are designed and deeply integrated with sensors that have connectivity as a standard feature.

"We introduced this around two years ago," he explains.

Since then, Elcome has fitted this solution into nine vessels, where third-party companies can connect to the machines.

"We keep this connectivity separate, and those who have access to it need to secure special permission from the authorised person. This is a new introduction to the market and we developed that, and it's evolving because clients are increasingly concerned about security and redundancy," Ameer chips in.

Likewise, navigation equipment, safety systems and other solutions benefit from having always-on connectivity, Grewal explains.

"Navigation, which we have been doing from day one, also benefits from always-on connectivity. We have been investing heavily in putting together solutions that help harvest data from ships that are meaningful for ship owners. For instance, we offer a solution that integrates weather and tide data and any safety warnings into the route planning. This enables the vessel to continuously adjust its route and speed, and optimise its operations based on the latest weather data. So securing that data, processing it in real time in the cloud and providing analytics back to the owners helps them have a better understanding of what is happening with their fleet so they can take steps to optimise the performance of that fleet. That is an ongoing development and something we are working on

with our partners," he explains.

Besides offering connectivity, solution providers have to ensure that it remains consistent and does not fail the team on the ship when they need it the most.

"We have the advantage of being able to provide consistent connectivity and the same bandwidth on all beams. That's because we club four or five coverages together and work with different partners," says Ameer.

Connectivity at sea, however, comes with a lot more challenges at present.

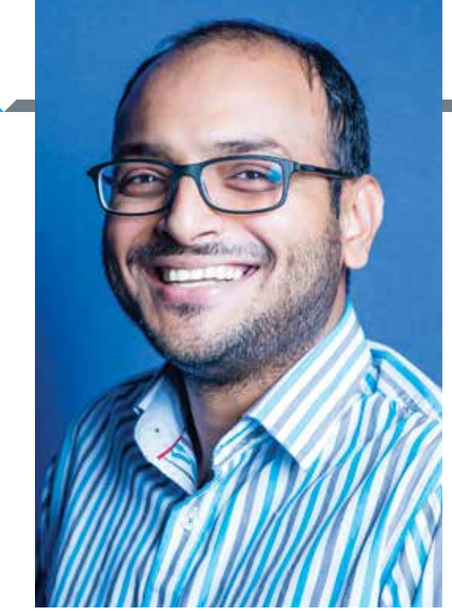
"The majority of data services come through satellite, so there is a much higher concentration of demand on satellite from major shipping and trading routes, but these are designed primarily to optimise coverage over land. Then adverse weather conditions can impact the performance of connectivity. Thirdly, with traditional satellites in geostationary orbits, there have always been latency issues," explains Grewal.

Fortunately, prices are going down as "big satellite providers are making huge investments in terms of repurposing beams to cover dense maritime channels", explains Grewal.

"Then there have been new satellite launches dedicated to addressing the needs of the maritime industry, and when more do this, it drives up supply and competition and eventually there has been a dramatic reduction in prices."

In addition, with VSAT antennas becoming smaller and lighter, more vessels have benefited from always-on connectivity, he points out.

"Now, with the development of low-Earth orbit satellites, we expect to see a similar major change in terms of the amount of bandwidth available at a fixed price. With the reduction in the size of the antennas, the cost of the antennas will go down, and of course there will be a reduction in latency."



> "Around 10 years back, people only wanted standard voice call and email. Now, we are providing between 6GB and 8GB each month ... on some vessels"
>
> **Asneed Ameer, Deputy Manager, Elcome**

With the technology just becoming available to offer sophisticated connectivity on vessels, Grewal reckons "this will be a time of major shift for the maritime industry" – one that Elcome believes it is ready to handle.

"We peaked at the right time because in our industry right now, everyone wants high bandwidth connectivity on all of their vessels. Whether they can justify that today or not is irrelevant. But the demand is there, and with these new networks of satellites coming up in lower-Earth, one no longer has to worry that there is no beam in the sailing route between east-bound and west-bound ships in the Indian ocean and the Arabian Sea. The maritime industry will benefit the most from this."

Grewal is quick to point out, however, that "the business model of providing connectivity will change".

"All the equivalent will be, in order of magnitude, smaller and cheaper. The service will be cheaper, so we have to be able to scale accordingly. And so one of the big investments we are making now is ensuring we are ready to have 10 times the number of vessels and provide them the same level of support that we can offer the current fleet that we manage."

He dismisses any scepticism about legacy equipment, stating that all existing equipment has a certain lifespan.

"The time it is going to take for these services to come fully online roughly coincides with the time of the remaining life of the larger antennas. It is also not yet clear how the weather will impact the LEO constellations in terms of the services they provide."

He believes there will always be challenges but remains optimistic that the industry "has always found solutions".

"Customers have addressed this in the past by having multiple services on board. They may have L-band combined with Ku- or C-band or whatever is required. That's our job. To understand their business and operational requirement, and try and kit them out with the right solution to fit their budget."

With 60% of its workforce holding an engineering position at the company, and three-quarters having an engineering background, Elcome believes it has the relevant skills to develop new solutions. Additionally, it has partnered with the largest navigation and automation equipment players, who are the main drivers in terms of providing connectivity on board, from an operational point of view.

With its 50th year on the near horizon, Elcome is poised to address the connectivity shift in the maritime sector. PRO

THE SHOW BEGINS

Michael Crimp, CEO of IBC, speaks briefly about some of the highlights at the show this year

What are the highlights of the conference this year and how is it different from previous years?
We have a new conference steering group, chaired by Keith Underwood, COO of Channel 4 in the UK. They have guided our team to create six new conference tracks focusing on the most pressing challenges. They have also added new formats into the conference, like breakfast briefings and lounge talks.

Besides the Global Gamechangers stage, which kicks off the conference, there are keynote presentations from the likes of Kelly Day of Viacom, Neal Mohan of YouTube, JB Perrette of Discovery, and former model and entrepreneur Lily Cole of Impossible.com.

What are some of the hot topics that will be addressed during the conference?
We have six tracks through the conference this year:

- New platforms: innovators and disruptors
- Audiences: engage; influence; grow
- Smart connectivity and multiplay devices
- Advertising: the new attention economy
- Cutting-edge tech innovators
- Nextgen: interactive and immersive experiences.

Within each of these streams, we have some big names who have pioneered new approaches and guided their businesses to successful achievements.

Alongside these are some special events, including our popular Leaders' Forum and CTO-level days on cybersecurity and the convergence of media and telecoms, plus the Gamechangers stage and popular regulars like What Caught My Eye and the IBC Big Screen events.

> "The industry is no longer bound by its technology, but by the desire to find new and engaging ways to tell stories"
>
> Michael Crimp, CEO of IBC

The whole conference programme has been very carefully designed to tell a story, to guide the visitor through the whole IBC experience.

In turn, I see that the industry is no longer bound by its technology, but by the desire to find new and engaging ways to tell stories, and to monetise those efforts fairly and equitably. Those, I think, will be the key messages debated at IBC this year.

How is IBC different from the other shows?
Over the last decade or so, the industry – and IBC – has moved away from broadcasting to a world where electronic media is delivered online and in public spaces, and where adjacent industries are adopting video and audio as inherent means of communication. Alongside broadcasting, the industry is expanding, and IBC's value as a global forum is expanding, too. In the earliest registrations for IBC2018, we are seeing measurable growth in visitors from adjacent markets like telcos and the cloud, showing that IBC as an experience is important.

How are the attendees and companies participating in IBC changing?
The last stage of development in IBC was a move away from an engineering-based event to one, which attracts debate from the creative, operational and commercial sides of media businesses. Today, that sweeping approach to all the issues makes IBC the natural forum for those in adjacent industries which are adopting our skills and technologies.

So we have specialist days in the conference which attract those from the telecoms industry, for example, or those charged with managing cybersecurity. Where appropriate, IBC creates a hosted programme to bring leaders from adjacent industries into the event and into the community. PRO

TOP TIP: *The new North-South metro line in Amsterdam has opened up, slashing journey times from central Amsterdam to RAI to just a few minutes*

Newtec addresses bandwidth at IBC

STAND 1A49

With UHD viewing growing in popularity, broadcasters delivering this content over satellite are seeing increasing pressure on their bandwidth and profit margins. The need for higher bitrates and more bandwidth has led Newtec to introduce its MCX7000 Multi-Carrier Satellite Gateway. This comes with the latest DVB-S2X standard, which introduced the concept of channel bonding. It allows a large UHD transport stream to be carried in parallel over up to three satellite transponders. For UHD TV specifically, a 20% gain in channels is possible. If channel bonding takes place over three transponders, it claims it can bring in bigger efficiency gain. The use of UHD with 4K and HDR also puts pressure on contribution links – required bitrates exceed standard available satellite frequency slots, so channel bonding gives the freedom to combine multiple non-adjacent slots.

Newtec will also demonstrate its DVB-S2X wideband modem and its brand-new MDM5010 satellite modem. The MDM2510 is a two-way, easy-to-install, high-throughput satellite modem that supports a wide range of IP services. From internet/intranet access to VoIP, backhauling, contribution and multicasting, the modem is designed for the mobility market, including maritime. The MDM2510 is able to address wideband HTS transponders up to 500MHz, providing further efficiency and operational gains.

The MDM5010 satellite modem is a very high-throughput modem capable of handling more than 500Mbps of traffic, enabling network operators to set up any type and size of network on any available satellite. It supports a range of IP services, including internet/intranet access, VoIP, backbones for mobile backhauling and trunking to fibre restoral/back-up services, contribution and multicasting services. This, along with the modem's high spectral efficiency, high packet and bitrate capability, makes it ideal for bandwidth-intensive services in the enterprise, backhauling, offshore and maritime markets.

Russian satcoms firm offers Express broadcast solutions

STAND 1.B31

Russian Satellite Communications Company (RSCC) will be at IBC to present its satellite solutions for the media industry for almost all regions of the world, using its Express-AM series.

RSCC will focus on solutions intended for broadcasters, based on the use of the capacity of the multifunctional spacecraft Express-AM5, -AM6, -AM7, -AM8 and -AM44, as well as on high-tech ground infrastructure, including RSCC's own TV platform.

The Russian company provides a full range of communications and broadcasting services via its fleet of 12 satellites and terrestrial infrastructure: video distribution and contributions, DTH services, presidential and government applications, broadband access and internet, IP trunking and cellular backhaul, mobility solutions for vessels, and more.

The RSCC satellites are positioned along the geostationary orbit from 14 ° W up to 145 ° E, covering Russia, CIS, EMEA, APAC, North and South America, and Australia.

ETL Systems to unveil StingRay

STAND 1.A33

ETL Systems will be launching its StingRay DWDM solution at IBC. The solution enables high-quality distribution between a satellite antenna and a remote-control room. Using DWDM technology, multiple signals can be transmitted and received over distances of hundreds of kilometres through a single fibre cable. It also offers the potential to deliver redundancy with an additional fibre connection.

The StingRay DWDM is able to maintain a much finer optical spectrum, enabling it to distribute up to 40 channels through a single fibre cable. It is able to cover much larger distances before suffering any signal loss. The addition of pre-amp and post-amp Erbium Doped Fibre Amplifiers further reduces the effects of any potential optical signal loss.

Ian Hilditch, CEO of ETL Systems, said: "Satellite is under pressure to deliver high performance and quality in all environments. Both CWDM and DWDM hold great potential to deliver RF signals more cost-efficiently and over large distances."

DEV Systemtechnik switches to 1975

STAND 5.A15

DEV Systemtechnik will showcase Alpha, a new cost-efficient system as part of its RF-over-Fiber (RFoF) product portfolio, and the 1975 combining matrix switch.

The Alpha, with its high-packing density, is designed for operators of cable networks and satellite ground stations.

"RF signals transmitted over conventional coax suffer signal quality loss, especially over increasing distance. With RFoF technology, this can be almost completely avoided. Here, electrical signals are converted into the optical domain for fiber transmission. At the destination, optical signals are then converted back into electrical form," Manfred Mettendorff, Managing Director of DEV Systemtechnik GmbH, commented.

DEV Alpha serves clients seeking cost-effective fiber optic connections within tight rack spacing. DEV consolidates 32 connections into one rack unit (RU). Owing to its splitters and switching modules, Alpha is also suitable for redundancy applications.

The Alpha indoor housing comes in a 19", 1 RU form factor and can be controlled via SNMP or the DEV Web Interface. Two redundant power supplies are interchangeable during operation. The weatherproof outdoor housing can be mounted flexibly on the antenna mast as part of its compact design to transmit antenna signals directly through optical fiber with no need for a separate outdoor equipment rack.

Also launching at IBC is the DEV 1975 (pic below), a fan-in matrix switch for satellite uplinks. Unlike distributing fan-out matrix devices, combining matrix switches allow several or all input signals to be routed into one output channel. The DEV 1975 can automatically switch signals according to signal levels. This allows a flexible arrangement of redundant capacity switching to guarantee constant availability in the event of signal failure. The matrix can be controlled and individually configured via SNMP or the DEV Web Interface and is available from 4x4 to 16x16 arrays.

An ODE to ViaLite

STAND 1.A23

ViaLite's new ODE-A4 range of outdoor enclosures can house up to four RF channels and offers lower power consumption using ViaLiteHD Blue OEM links. They replace the company's classic ODE-A RF over fibre (RFoF) enclosures and can be used for permanent fixed installations or for rapid field deployment of mobile systems. Small, lightweight and easy to install, the enclosures are IP65- and NEMA 4-rated for harsh environments, with external weatherproof fibre and power connections.

AC and DC versions are available, and dual redundant power supplies are provided. With a five-year warranty as standard, the ODE-A4 range is available in four versions: a GPS version to bring GPS/GNSS signals into buildings; a cost-effective VSAT model; the ODE-A4 Quad LNB for connecting single-channel and quad LNBs for RFoF interfacility links; and ODE-A4 Configurable to configure any type of ViaLiteHD Blue OEM link.

New monitoring with PROFEN's EagleEye

STAND 5.629

PROFEN Communication Technologies, founded by a small group of engineers based in Istanbul and serving the broadcast and satellite companies in the country, will be at IBC this year. PROFEN Group has Turkey's first and only private satellite gateway facility in Konya, to service not only Turkey but also the region. It is currently used by Avanti for broadband internet for the region.

This year at IBC, PROFEN will demonstrate its EagleEye management system, its Konya Teleport facility and services, its portable satellite terminals, X-Y Pedestal Type ESA, satellite TV quality monitoring system, and system integration capabilities in satcom and broadcast.

EagleEye claims to open a new era in NMS technology with next-generation service level management capabilities for broadcasters, teleport and telecom operators, data centres and other types of managed facilities. The EagleEye monitor and control system will keep an Earth station or facility in full operation as well as take care of all daily tasks and workflow.

Key features include multi-client, multi-level, multi-task user configuration and authorisation; M&C of geographically dispersed Earth stations, teleports, data centres, and remote and diverse sites; multi-level real-time signal tracking, fault diagnostics, alarm correlation, graphical signal analysis in real time and offline stored data; audible and visual notification of alarms and events; alarm masking, disable/enable alarm, severity ratings; email notification; task scheduling; redundancy switching at circuit or service level; facility and building services management; and alarms and user events that are logged automatically and can be exported as CSV, HTML, PDF or Image formats.

EagleEye is a Microsoft Windows-based platform which uses SNMP V1/V2, TCP, UDP, SOAP, TELNET, RS232/RS422/RS485, MODBUS and CAN protocols to communicate with all equipment.

The advent of a new portable range from IMT Vislink

STAND 1.A69

IMT Vislink will display new Advent satellite communication products at IBC this year. The Advent range allows operators to access end-to-end satellite communication workflows and provide turnkey deployments in the field.

The new Advent AirPro 75Ka antenna is a low-cost antenna that works alongside the new Advent DVE6100 encoder and IRD6200 decoder, in addition to the Advent MSAT man-portable satellite antenna system and the Advent NewSwift HD 240 motorised satellite terminal. These solutions provide cost-effective, reliable transmissions within mobile and rapid deployment packages.

The Advent AirPro 75Ka is a small, lightweight, low-cost, single-button deployment IP satellite data terminal for use with Eutelsat's Tooway service. It works alongside the new Advent DVE6100 encoder and IRD6200 decoder to deliver greater transmission efficiency. The Advent DVE6100 and IRD6200 are the smallest and lightest 4K UHD DVB-S2X exciter and 4K UHD HEVC DVB-S2X IRD on the market. They provide ultra-low latency with multi-mode compression/decompression for MPEG-2, H.264 and HEVC, with four-channel HD capability for resolutions up to 1080p. Both products include a flexible IP streaming engine.

The Advent MSAT is a portable, lightweight, tri-band satellite terminal that can be set up anywhere for secure and non-secure data and video transmission in as little as five minutes. It supports X-, Ku- and Ka-band configurations, ensuring worldwide coverage is always available.

The Advent NewSwift HD 240 antenna is a Eutelsat-, Intelsat- and Arabsat-compliant lightweight roof-mounted drive-away antenna designed for reliability and functionality for today's broadcast and military markets. All three motorised axes work simultaneously for an on-air time of less than five minutes.

NEW LEASE OF LIFE FOR LOST SATELLITES

In-orbit servicing will revolutionise satellite operations in MEA and beyond, explains Arie Halsband

In the past decade, satellite operators have suffered a series of anomalies. Spacecom, for example, lost contact with its AMOS-5 satellite stationed in geostationary orbit over Africa, while a multi-million-dollar Nigerian satellite had to be shut down a little over a year after its launch, to prevent it spinning out of control and damaging others in orbit. This year, it was revealed that the Al-Yah 3 satellite had been launched into the wrong orbit, forcing it to lose over a third of its expected lifespan to reach operational orbit. The error was undoubtedly a costly one; it is predicted to result in a circa $78 million insurance claim. Careful and devoted engineering efforts allowed it to eventually reach operational orbit.

With satellites costing hundreds of millions of dollars to put into orbit, even the slightest mishap can lead to significant unexpected costs. And if a mistake should occur, satellite operators' options have historically been limited: retire the satellite early, endure extensive costs trying to rectify the mistake, or risk dangerous consequences.

This landscape is one of the key drivers behind the development of in-orbit servicing. In 2014, the US military's Defense and Advanced Research Projects Agency stated that "the ability to safely and cooperatively interact with satellites in GEO would immediately revolutionise military and commercial space operations alike, lowering satellite construction and deployment costs and improving satellite lifespan, resilience and reliability", and since then momentum for the technology has surged. In January this year, market research firm Northern Sky Research concluded in its 'In-Orbit Servicing Markets' report that by 2028 the market will be worth $3bn, with life extension driving much of this revenue.

Satellite servicing technologies enable space assets to be serviced, delivered, maintained, monitored and guaranteed in orbit and beyond.

However, while the advantages of in-orbit servicing are clear, it has only become a reality thanks to recent technological advancements. One critical challenge that had to be overcome was the creation of a viable servicing spacecraft that could be built, launched and operated at the fraction of a traditional satellite's cost. Why would anyone pay for a servicing spacecraft if its cost was the same as buying and launching a replacement satellite? The servicing spacecraft must contain enough fuel to serve its multiple customers; be able to operate for many years; power its own systems; rendezvous and dock with the host satellite; act as an additional propulsion system carrying out the necessary manoeuvres (station-keeping and attitude control); and, if needs arise, relocate or de-orbit the satellite.

To address this challenge, forward-thinking satellite operators are looking to use external 'jet-pack' solutions which can be about the size of a household washing machine. These use electric propulsion, with a substantial supply of onboard propellant, to manoeuvre. This fuel is used to reach the host satellite for station-keeping and attitude control. Further service could include moving a satellite to a new orbital slot.

Earlier in the year, we signed a $100m contract with a major regional satellite operator, which will see two SPACE DRONE spacecraft launched into orbit in 2020, to significantly extend the life of two communication satellites. Anticipated future services include support for low-Earth and medium-low-Earth orbit constellations, active debris removal, in-space explorations, mining and manufacturing logistics. Life extension and in-orbit services are crucial tools that can be used to manage future fleets and assets and ensure commercially viable services. With more than 400 satellites currently in geosynchronous Earth orbit and thousands expected to be deployed in low-Earth orbit, the market opportunities are considerable. PRO

Arie Halsband is founder and CEO of Effective Space

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