ISSUE 45 | NOVEMBER 2015

SATELLITE PRO

TECHNOLOGY INTELLIGENC ET

MIDDLE EAST

OFFSHORE SERVICES
Satellite services have evolved to incorporate a lot more than just communications on oil rigs

TRANSFORMING TRAVEL
Being constantly connected is no longer a choice, but a necessity for passengers in the sea and sky

Imparting knowledge

Arabsat to grow 26-degrees East and promote anti-jamming, through ground control, with Badr 7


A new star for broadcasters
eutelsat
EUTELSAT 8 West B was successfully launched on August 20th, 2015 and joined the satellites already operated at the adjacent 7° West position by Eutelsat and Egyptian satellite company, Nilesat. The 7/8° West video neighbourhood is one of the most dynamic in the global satellite TV market, with a rapidly growing audience and channel line-up. 52 million homes in North Africa and the Middle East are already equipped for DTH reception.
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Magical Marrakech

Marrakech is a wonderful city, full of old-world charm. It left a lasting impression on me when I visited it last month for the Arabsat Broadcasting Forum, Atheer 2015. The people were extremely hospitable, and the cuisine scrumptious. The old souk felt like it was trapped in a place that time had forgotten. With traders selling everything from pottery to textiles, handicrafts and spices, it felt almost as though I had been transported back to the Berber dynasty.

The event was well attended by some of the most influential CEOs in the satellite and broadcasting sphere, from the Arab region. Familiar faces included those of Ali Ahmed Al Kuwari of Es'hailsat, Sam Barnett of MBC, Saud Alganam of Al Majd Network, Samir Safir of My-HD, Amr El Kahky of Al Nahar TV and Dr Raed Khusheim of Selevision. This truly was an event not to miss, not just discussing the challenges in the region, but also addressing new technologies and satellites that Arabsat is planning to launch. Speaking of new satellites, Badr 7 will be launched from Arianespace in French Guiana on November 10th. This will enhance the 26-degrees East hotspot and will allow Arabsat to host 1000-1500 channels at this hotspot.

In other news, with ADIPEC taking place from November 9-12, we decided to do a feature on the use of satellite technology in the oil and gas industry. The feature looks at how satellite is no longer just used for communications, but also other services like M2M, rig management, telemedicine, TV broadcasts and to maintain crew welfare. Read more on page 18 of this issue.

I look forward to seeing you all at our annual event titled "ASBU presents BroadcastPro Selevision Summit and Awards" on November 10, at the Habtoor Grand Hotel in Dubai.

Have a fantastic November!

Clayton Vallabhan
Editor

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"With this expansion, we will be able to host around 1,000-1,500 TV channels."
Khalid Balkheyour, President and CEO, Arabsat
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"The reliable 99.9% availability of satellite links allows applications such as telemedicine to deliver clinical health care in emergency situations."
Hussein Oteifa, GM, ME, SES
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"By combining GEO and MEO capacity, a unique offering in the satellite industry, we can provide comprehensive mobile coverage that offers massive throughput."
Gez Draycott, VP, Portfolio Management Data Mobility, SES
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"This represents a neutral or minimal cost impact, and at the same time, we have not experienced any deterioration in ADS-C performance."
Mary McMillan, VP, Inmarsat's Safety and Operational Services
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Badr 7 to launch on November 10 from French Guiana

At Arabsat's 8th Broadcasting Forum, Atheer, Khalid Balkheyour, President and CEO of Arabsat, announced that the company's Badr 7 satellite is ready to launch on November 10.

The Badr 7 satellite will broadcast from the 26-degree East orbital position and will accompany other Badr satellites at this hotspot. This will increase capacity at this position and thus allow for more TV channels to be broadcast.

The satellite operator will also be launching three more satellites in the future.

Balkheyour said: "The other three are currently being manufactured, one in partnership with the global operator Inmarsat, the second in partnership with King Abdelaziz City for Science and Technology in Saudi Arabia, and the third in partnership with some Arab administrations, featuring high satellite capacity including Ka-band package capacity, with an investment exceeding $1.5 billion."

+ www.arabsat.com

Badr 7 to launch on November 10.

APT SATELLITE PENS CONTRACT

APT Satellite has entered into a contract for the APSTAR-6C satellite with China Great Wall Industry, immediately after the successful launch of the APSTAR-9 satellite. The APSTAR-6C satellite is the second DFH-4 platform satellite that APT Satellite has procured from CGWIC-HK.

APSTAR-6C is an in-orbit delivery programme. The satellite will be equipped with 45 transponders in C-, Ku- and Ka-bands, with designed service life of 15 years, providing high-power transponder services to customers across the Asia-Pacific region for VSAT, video distribution, DTH and cellular backhaul applications.

APSTAR-6C is designed to replace the in-orbit APSTAR-6 satellite, and can also serve as a backup for other APSTAR satellite programmes being planned.

APT Satellite owns and operates the APSTAR satellite fleet, covering Asia, Europe, Africa and Australia, containing approximately 75% of the world's population.

+ www.apstar.com

EUTELSAT'S CEO TO STEP DOWN IN 2016; WILL CONTINUE ON BOARD

Eutelsat has announced that Michel de Rosen has decided to step down from his position as CEO in March 2016. He will remain in the role of non-executive Chairman of the Board of Directors of Eutelsat until the end of his current mandate in November 2016, at which point his mandate will be submitted to the Annual Shareholders' Meeting for renewal.

Eutelsat's Board of Directors has elected Rodolphe Belmer as the successor to Michel de Rosen in the role of CEO, effective from 1 March, 2016. In order to create the conditions for a smooth transition process, he will join Eutelsat as Deputy CEO on 1 December, 2015, alongside Michel Azibert, Deputy CEO and Chief Commercial and Development Officer. He will be proposed as a member of Eutelsat's Board at the Annual Shareholders' Meeting of November 2016.

"It has been my great privilege since 2009 to serve as Eutelsat's CEO and latterly as Chairman and CEO," said Michel de Rosen. "During this period, we have consistently put innovation at the heart of our service to customers, significantly expanding our geographic reach and cementing our reputation as leaders in technical excellence. We are proud to have launched Europe's first full High Throughput Satellite, the first commercial all-electric satellite, and to have procured Eutelsat Quantum, the first software-defined satellite. I take this opportunity to salute all our employees for their tremendous dedication and talent which have made possible these accomplishments."

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M-Three Satcom acquisition complete

Giglio Group, a global multimedia and TV network, has announced the acquisition of the totality of M-Three SatCom Srl (M-Three), an Italian company active in the supply of high-end services and solutions for the radio and TV broadcasting industry. The company counts among its clients major TV and radio networks, both Italian and foreign.

M-Three operates via a proprietary infrastructure based on two teleports for satellite broadcasting, integrated in an optical fibre network with hundreds of international PoPs, allowing the company to detect and distribute signals all over the world.

The value of the transaction is 2.65 million euros, to be fully paid in cash. Thanks to this acquisition, Giglio Group will now incorporate a strategic partner capable of integrating its TV signal broadcasting technologies, via both satellite and optical fibre, together with Giglio Group's very own platform of content and channels

that already spread all over the world.

M-Three closed the 2014 financial year with total revenue of 8.3 million euros and an EBITDA of 586,000 euros (7%), showing a wide margin for improvement. The sum paid by Giglio Group to acquire 100% of MThree was determined by multiplying 2014 EBITDA by 4.5, confident that the margin in previous years will improve significantly in the near future.

By acquiring M-Three, the Group now owns an important production and broadcasting infrastructure.

+ www.m3sat.com/en

MBRSC PARTICIPATES IN THE 7TH SUMMIT ON EARTH OBSERVATION

The Mohammad Bin Rashid Space Centre (MBRSC) took part in the 7th Summit on Earth Observation Business, held in Paris. Representing the United Arab Emirates, Eng Salem Al Marri, Assistant Director General for Scientific and Technical Affairs, attended and spoke at the summit on behalf of MBRSC and introduced the Centre's projects and goals to the participants.

During his session, Al Marri discussed the different sectors of MBRSC, focused on MBRSC's main projects and also spoke about how innovation is a major focus in all the Centre's projects.

He gave updates on KhalifaSat, the first Emirati-built satellite, scheduled for launch in 2018; DubaiSat-1, the first remote sensing satellite owned by the UAE; and DubaiSat-2, the Earth observation satellite.

He also spoke about the upcoming Emirates Mars Mission (Hope Probe), which is due to be launched in 2020.

+ www.mbrsc.ae

AsiaSat 4 satellite at 122-degrees East.

ASIASAT AND ROHDE & SCHWARZ DEVELOP FTA UHD TV SERVICE

AsiaSat and Rohde & Schwarz have partnered to advance next-generation Ultra-HD (UHD) TV technologies by implementing the first free-to-air (FTA) UHD channel on AsiaSat 4. The R&S AVHE100 encoding solution and R&S CLIPSTER mastering station are key components of the UHD broadcast platform, which will launch a UHD channel at 122°E on AsiaSat 4 this month.

AsiaSat plans for an UHD TV broadcasting service over satellite have taken a major step forward with the imminent launch of its first channel, following an extensive technical evaluation carried out at the AsiaSat UHD laboratory. Through AsiaSat 4's high-power coverage, broadcasters and pay-tv platforms with an AsiaSat 4 C-band antenna in the Asia-Pacific region will be able to receive the UHD channel directly.

Operating at 122°E, AsiaSat 4 provides leading-edge satellite solutions to clients for TV distribution, DTH and broadband services.

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Environmental monitoring key to UAESA

The importance of satellite and space technology to environmental monitoring was highlighted by the UAE Space Agency at the Eye of Earth Summit 2015 in Abu Dhabi. Director General HE Dr Mohammed Al Ahbabi, speaking at the summit, explained that the UAE Space Agency will support international collaboration through space agency cooperation, to promote the use of space assets that facilitate joint environmental research projects.

The UAE Space Agency will support and harmonise access to Earth observation monitoring resources from international organisations and locally generated data from MBRSC's DubaiSat.

Dr Al Ahbabi said: "Space assets are our Eyes on Earth and enable us to perform Earth observation. GNSS and satellite communications are indispensable tools for environmental monitoring and management and help pave the way for a sustainable, safe and ecologically balanced environment."

"The UAESA will endeavour as part of our mandate to promote Earth monitoring and tracking, not only for the benefit of the UAE, but for the benefit of all."

+ www.uaesa.ae

The launch of Eutelsat 8 West B from Arianespace in French Guiana.

EUTELSAT 8 WEST B BEGINS BROADCASTING TO THE MENA REGION

Eutelsat has announced that its new EUTELSAT 8 West B satellite has been fully powered up and is already broadcasting TV channels to over 52 million homes in the Middle East and North Africa.

Launched on August 20 by an Ariane 5 rocket, the new high-power satellite is co-located with a constellation of satellites operated by Eutelsat and Nilesat at the 7/8 degrees West neighbourhood.

Working in close collaboration with clients, Eutelsat completed a seamless upgrade on the night of September 30 of over 210 television channels onto the new satellite, from two Eutelsat satellites located at 7/8 degrees West. Both satellites are now being relocated. The additional capacity on EUTELSAT 8 West B will enable over a hundred further channels to be accommodated.

For the Arab and international broadcasting community, the entry into service of EUTELSAT 8 West B marks a milestone in the growth story of the most popular satellite TV neighbourhood in the MENA region.

+ www.eutelsat.com

EUTELSAT AND FACEBOOK PARTNER TO BRING AFRICA ONLINE

Eutelsat and Facebook have announced they are partnering on a new initiative that will leverage satellite technologies to get more Africans online. Under a multi-year agreement with Spacecom, the two companies will use the entire broadband payload on the future AMOS-6 satellite and build a dedicated system comprising satellite capacity, gateways and terminals. In providing reach to large parts of Sub-Saharan Africa, Eutelsat and Facebook will each be equipped to pursue their ambition to accelerate data connectivity for the many users deprived of the economic and social benefits of the internet.

Scheduled for start of service in the second half of 2016, the Ka-band payload on the AMOS-6 geostationary satellite is configured with high-gain spot beams covering large parts of western, eastern and southern Africa. The capacity is optimised for community and direct-to-user internet access, using affordable off-the-shelf customer equipment. According to the terms of the agreement, the capacity will be shared between Eutelsat and Facebook.

Using state-of-the-art satellite technology, Eutelsat and Facebook will each deploy internet services designed to relieve pent-up demand for connectivity from the many users in Africa beyond the range of fixed and mobile terrestrial networks. Satellite networks are well suited to economically connecting people in low-to medium-density population areas, and the high throughput satellite architecture of AMOS-6 is expected to contribute to additional gains in cost efficiency.

The capacity will enable Eutelsat to step up its broadband activity in Sub-Saharan Africa, initiated using Ku-band satellites to serve professional users. Eutelsat is establishing a new company in London to steer its African broadband vision and business. It will be led by Laurent Grimaldi, founder and former CEO of Tiscali International Network, and will focus on serving premium consumer and professional segments.

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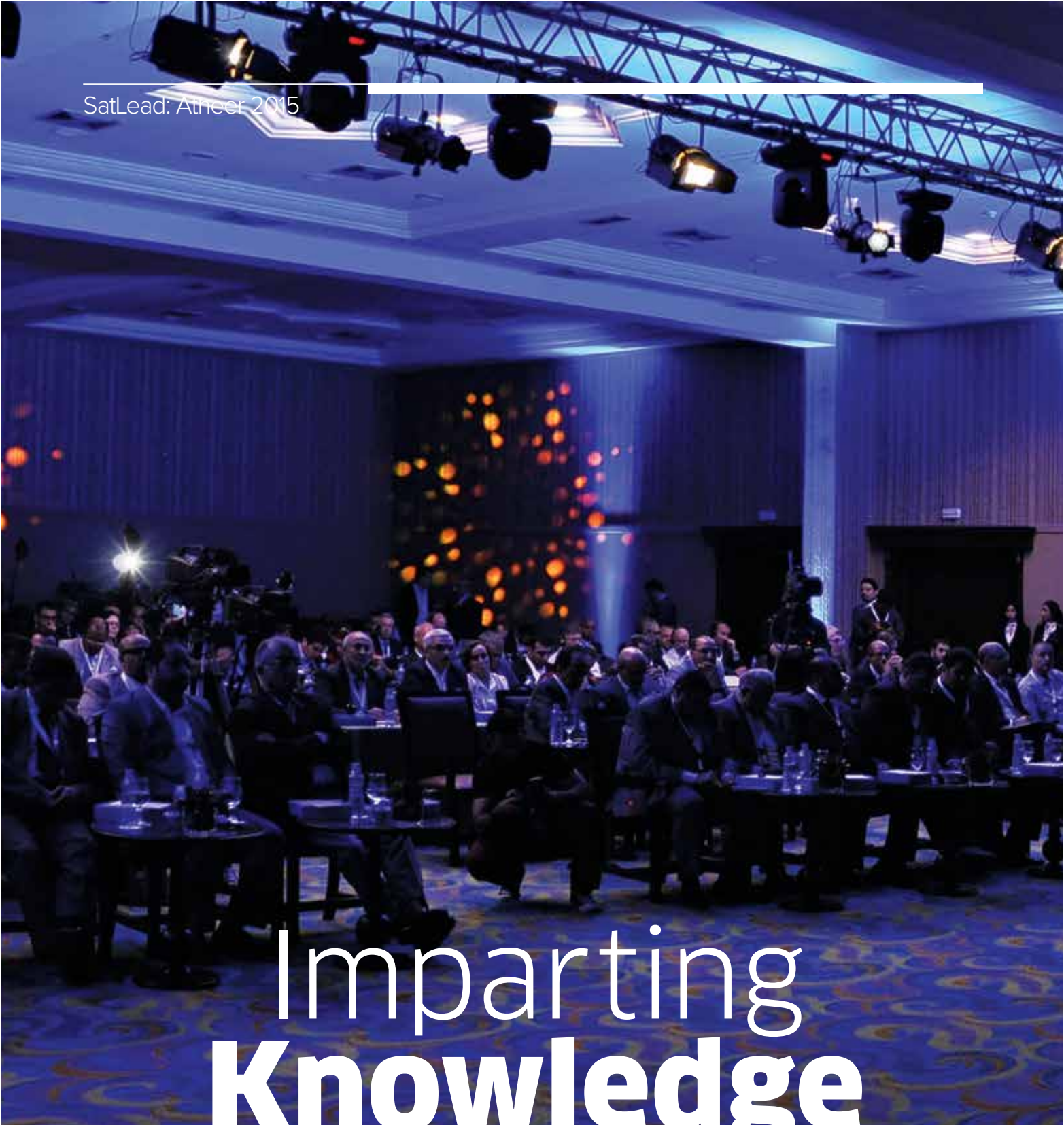

Imparting **Knowledge**

Arabsat's Broadcasting Forum, Atheer, brought together more than 130 delegates, to discuss the challenges and technological advances in the MENA satellite sphere

Arabsat's eighth Broadcasting Forum, Atheer, took place in Marrakech, Morocco last month, and was attended by 130 delegates, many of who are the operator's major customers.

The location of the event tied in nicely with the Arabian theme, and Marrakech lulled all present with its old-world charm and resplendent culture. The event was held at the new Savoy Le Grand in Marrakech, which exuded an ambience of grandness and opulence.

The 26-degree East hotspot which is Arabsat's prime hotspot, has been hotly competed against by other operators. Arabsat's objective is to differentiate itself and be the first choice for the Arab world. In order to achieve this, says Ahmed Balkheyour, President and CEO of Arabsat.

He says the company has taken many initiatives to improve the hotspot.

"The administrative part of these initiatives is the right content. We also have the best fleet in the region with Badr 4, Badr 5 and Badr 6. Badr 7 is also coming up at the 26-degree East orbital position, and hence technically we have the best coverage and the newest fleet, which we are expanding in other locations of Arabsat too."

Balkheyour thinks that part of the lure for customers to this hotspot is its agreement with Es'hailsat. He considers this partnership a solid proposition for enhancing the value of the hotspot.

"In Qatar, there is a lot of content, through local government channels and Al Jazeera and BeIN. It's a win-win situation, we share with them our location, they grow and we grow, and this enriches 26-degrees East. We also have all the capacity needed with our new fleet. We can cater for HD, and also for a lot of additional channels. This will help us grow."

Other Arabsat initiatives include being closer to customers. It has contributed to building platforms in many countries, which are going to be exclusively broadcast through Arabsat.

The operator has also introduced the concept of spot beams, where different broadcasters can selectively choose different coverage areas across the Arab world. Balkheyour believes these availabilities will help leverage customer needs.

Atheer discussed the importance of enriching the 26-degrees East hotspot for Arabic programming.

Delegates at the forum included some of the top CEOs in satellite broadcasting and programming in the region.

"Today we are transmitting around 550 channels on our Badr fleet, and with this expansion we will be able to host around 1,000-1,500 channels. All of this capacity will be sold directly to the broadcasters through Arabsat, and not resellers. This is what further differentiates us in the way we do business in the region"

KHALID BALKHEYOUR,
President and CEO, Arabsat

With the launch of Badr 7 on November 10, there will be a lot more incremental capacity at the 26-degree East hotspot. Balkheyour says: "Badr 7 has Ku-band capacity, spot beams and Ka-band, which offers high throughput for data. The satellite also has coverage over the MENA region, as well as all of Africa."

"Today, we are transmitting around 550 channels on our Badr fleet, and with this expansion we will be able to host around 1,000-1,500 channels. All of this capacity will be sold directly to the broadcasters through Arabsat, and not resellers. This is what further differentiates us in the way we do business in the region."

The Ka-band capacity on the satellite was pre-sold to Trio, a triple-play service provider. Balkheyour thinks this will enhance the location and add to Arabsat's customers that need data services and the internet.

Another customer concern is the need for anti-jamming capabilities. Technology can be embedded in the satellite so that it can be used for anti-jamming; however, this is very expensive on commercial satellites.

Arabsat does things a little differently. Balkheyour says the operator can mitigate jamming through ground control, where it uses different spectra or different stations to uplink to the satellite. A jammer can only be within one particular location or spot to jam, and jamming usually comes from within a neighbouring country. He explains that this makes it unlikely that the signal can be jammed, as it is being uplinked from multiple locations.

"Speaking about the Ka-band spectrum on our satellites, there are two things. The first is that it is not readily available in the market and costs much more, but it's not only that. Even if a jammer can acquire a station, he has to be within that spot to jam the signal. Another option that we are offering on Badr-7 is the ability to uplink from Europe, so a jammer has to be in Europe to jam, not in the neighbouring countries in the Arab world. These will protect our customers from intentional jamming."

Arabsat has had a few jamming experiences in the last three years, and Balkheyour says the operator fought

against these in technical and legal ways. It addressed the problem to the Arab League and the ITU in Geneva, and measurements were taken in the legal arena.

He thinks jamming has been reduced significantly since implementing these initiatives, and says with a smile of contentment that in the last six months there have been no cases of jamming, and that he is sure it will stay that way.

Atheer was a power-packed event that also discussed other salient topics that educated Arabsat's clients about new technologies incorporated by the operator. It addressed pertinent issues such as piracy and content protection, and ways to mitigate the emerging threat.

CEOs from the Arab satellite and broadcasting world were present at the event, including Ali Ahmed Al Kuwari of Es'hailsat, Sam Barnett of MBC, Saud Alganam of Al Majd Network, Samir Safir of My-HD, Amr El Kahky of Al Nahar TV and Dr Raed Khusheim of Selevision.

Panel discussions ruled the first day of the event, followed by interviews with movers and shakers in the industry on the second.

Balkheyour says: "We have developed this event for eight years and are very keen to be close to our customers, as well as differentiate ourselves in our customer care. We at Arabsat are serious about doing this actively, and interaction with our customers is key. We always encourage them to come to our networking events and be active in expressing their needs, plans and how we can serve them better."

He says that he is very pleased with the turnout this year, and that Arabsat always tries to find a place with easy access for visas, as well as a serene environment where people can relax. The main focus, however, remains the operator's customer needs.

There were many dignitaries that attended, including Fawzi ElGhowil, Director of the Technical Secretariat of the Information Ministers Council, in the League of Arab States. In a speech, he asserted the necessity of implementing the Arab media code of conduct as a binding regulation for media professions in the Arab region. He also stressed the need to adopt professional ethics in methodology and behaviour, applying to all media, as it is a major outlet that serves the causes of mankind. This includes the adoption of the Arab media action plan outside the Arab region and approval of the anti-terrorism joint Pan-Arab media strategy.

"We do believe in free media, but there is no absolute freedom. There are always some guidelines, whether it's for Arabic media or international. People have to work within those guidelines and respect their viewers. We are not a media company, we transport media. However, we do have a responsibility"

KHALID BALKHEYOUR,
President and CEO, Arabsat

Also present were representatives from Saudi Media City, who explained that the public authority for audio-visual communication in Saudi Arabia seeks to further develop the media sector in the country. It encouraged channels to broadcast from within Saudi Arabia and is looking forward to launching new channels based in Saudi Arabia, as well as encouraging Saudi-owned channels operating abroad to move their headquarters to the Kingdom.

"We have a lot of competition. Arabsat started the first satellite TV operation in the Arab world. After a while, other operators came on, and there was also competition with operators from outside the Arab world. This is what concerns me, because then we lose control of our ethics, standards and guidance, and it recedes into becoming non-obligatory.

"I'm not talking about controlling the media. We do believe in free media, but there is no absolute freedom. There are always some guidelines, whether it's for Arabic media or international. People have to work within those guidelines and respect their viewers. We are not a media company, we transport media. However, we do have a responsibility," says Balkheyour.

In conclusion, Atheer was a real pleasure to attend, and was a fantastic networking opportunity for Arabsat's customers and players in the industry.

It was about a three-hour scenic drive from the airport in Casablanca. Acres of agricultural land were interspersed with goats grazing in pastures, a shimmering river passing sleepily through and the picturesque Atlas mountains in the background. The soothing pink architecture throughout the resort town of Marrakech provided just the reprieve necessary for a hardworking community like ours, and the rich cuisine of saffron-infused tagine, combined with mesmerising storytellers and entertainment, transported all and sundry to a place that time forgot.

The city's medina was a throwback to a medieval era when the Berber dynasty ruled supreme. Rustic horse-drawn carriages transported tourists through maze-like alleyways, where throngs of market dealers sold artefacts, pottery, cosmetics, jewellery and textiles.

Morocco left a lasting impression, and the generosity and friendliness of its people will be forever etched in memory. PRO

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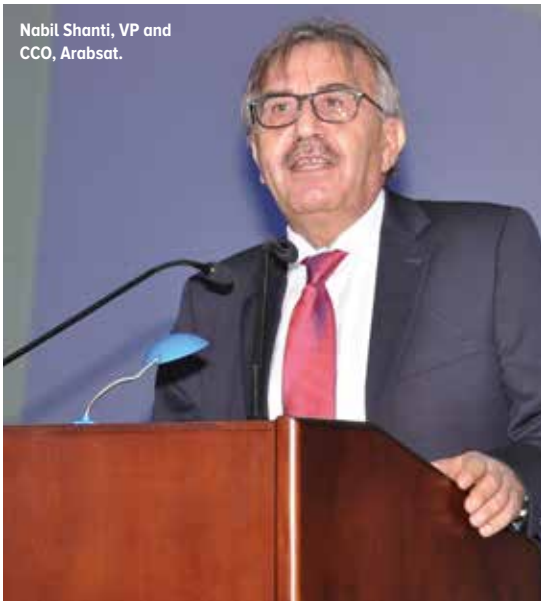
Ali Ahmed Al Kuwari, CEO, Es'hailsat.



Nabil Shanti, VP and CCO, Arabsat.

Delegates networking with Khalid Balkheyour, CEO, Arabsat.

Group photo of all the delegates and speakers at Atheer 2015.

Dr. Raed Khusheim, CEO, Selevision.

Chris Forrester, journalist, Advanced Television.

Dr. Riyadh Najm, Media Expert.

Offshore **Communications**

With oil and gas operations taking place in the most remote locations onshore and offshore, where it is not economically viable to lay terrestrial network infrastructure, satellite communications are essential to support the industry

The only communications technology that can support the global nature of the oil and gas sector is satellite. Operations often take place in remote areas – on land and at sea – and supervisors at headquarters need to maintain constant contact with their sites. Broadband satellite connectivity has served as a critical communications link for oil and gas companies for decades.

"Intelsat provides always-on, true broadband via the Intelsat Global Broadband Mobility Network, a network of 14 customised beams on 12 satellites that is fully integrated with our existing satellite fleet and our IntelsatOne terrestrial infrastructure. This enables the rigs to leverage bandwidth-intensive applications to improve day-to-day operations and profitability as well as provide entertainment and welfare services for the crew," says Karen Emery, Director, Product Management, Broadband Services, Intelsat.

Satellite links are used for secure intranet and internet access, giving remote workers the same access to business and control applications they have in the onshore office. According to Hussein Oteifa, GM, SES, Middle East, offshore rigs and support vessels are also progressively relying on satellite communications to increase operational efficiency, with real-time monitoring, seismic surveys, M2M sensing and video surveillance.

"Additionally, health and safety has always been of utmost importance for energy companies working in these environments. The reliable 99.9% availability of satellite links allows applications such as telemedicine to deliver clinical health care in emergency situations, or e-training on safety and best practices for crew on board," says Oteifa.

Oteifa also says that HTS will be a game-changer for the oil and gas industry. SES is the only satellite operator to offer both GEO and MEO HTS satellite capacity. Through a significant investment in O3b, SES is offering MEO HTS capacity, whose low latency features further enhance the value proposition of a satellite solution to satisfy thin client applications.

"Through frequency reuse over multiple high-power beams to increase throughput by a factor of 20, HTS capacity – whether on a geostationary (GEO) or Medium Earth Orbit (MEO) satellite – is enabling the industry to offer lower cost per bits, making satellite a competitive offer to terrestrial infrastructure.

Hussein Oteifa, GM, SES, Middle East.

"Through frequency reuse over multiple high-power beams to increase throughput by a factor of 20, HTS capacity – whether on a geostationary (GEO) or Medium Earth Orbit (MEO) satellite – is enabling the industry to offer lower cost per bits"

HUSSEIN OTEIFA, GM, SES, Middle East

"Energy users understand the inherent need for satellite to provide reliable connectivity to remote users. The ability to push more data through HTS bandwidth while decreasing the cost per bit makes the proposition of increasing operational efficiencies via satellite connectivity ever more attractive. This revolutionises the potential of automation and will bring office-like high-speed connectivity to these remote installations and mobile vessels," Oteifa says.

Fahad Kahoor, Director of Market Development for Energy at Thuraya, says that even though HTS comes with a lot of benefits, feedback from Thuraya's clients shows that companies are cautious about making new investments and remain focused on cost management. The current situation of falling oil prices means there is a challenge for some companies to gain access to satellite communications, either as a primary channel or as a secondary one, in a cost-effective way. Kahoor says it is an opportunity to provide a reliable service that appeals to oil and gas companies' operational applications and crew communication needs, with cost-effective, competitive packages in comparison to other satellite operators.

Emery says: "The Intelsat Epic^{NG} platform is designed to exceed the requirements of leading service providers, enabling throughput in the range of 25-60Gbps per satellite, about 10 times that of traditional satellites. This will provide the global bandwidth solution service providers need to serve oil and gas customers. At the same time, the design of Intelsat Epic^{NG}, which combines backwards compatibility with an open-architecture approach, enables service providers to evolve their existing infrastructure to address any changes or increases in demand."

"The first two Intelsat Epic^{NG} satellites will be placed into service in the next 18 months, providing a fully integrated HTS overlay to our current wide beam services. Intelsat 29e will provide HTS coverage over the Americas and the North Atlantic. Intelsat 33e, scheduled for launch later in 2016, will bring capacity over Europe, Africa and Asia."

Beyond communications on an oil rig, there are a lot of other reasons for the use of satellite. If an oil and gas operator needs to bring back live video from a rig, or support data or video coming from a rover, satellite provides flexible solutions. Emery explains that satellite broadband allows on-site managers to interact with onshore staff during critical periods of operations, exchange time-sensitive data in a secure, reliable manner and remotely monitor rig functions.

All of this helps improve day-to-day operations and profitability. Satellite connectivity also enhances crew safety and health, as social media and online entertainment are vital to maintaining crew welfare. This can have a real impact on an operator's ability to retain trained and qualified crew, and reduce the expense associated with employee churn.

Oteifa says environmental safety on an oil rig is another critical requirement, especially in the wake of several oil spill disasters in recent years. Technology innovation and improvements are therefore needed to mitigate the risk of such incidents.

Another aspect of implementation on an oil rig is data recording via remote sensors, providing workers with information on when to act on safety measures, and emergency procedures which can prevent anomalies that would otherwise have an environmental impact or even endanger lives.

Kahoor says there are many ways that satellite communications can facilitate mission-critical applications on oil and gas installations. "Companies today need to consider private radio, GSM and mobile satellite solutions as part of their overall communications infrastructure. MSS [mobile satellite service] solutions have the resiliency and reliability to act as a backup plan for terrestrial solutions. For geographically remote locations not served by terrestrial networks, oil and gas companies can leverage the strength and capacity of L-band networks, such as Thuraya's, to enjoy uninterrupted connectivity, even under adverse weather conditions."

"The next is securing assets: Security and pipeline monitoring applications are a growing concern in the energy sector. To address this, IoT [Internet of Things] applications can be leveraged for video surveillance to monitor operations in areas which are not easily accessible by teams. Deployment of VPN via mobile satellite solutions such as IP broadband terminals provides an additional layer of secure and reliable, end-to-end connectivity over public or private communication networks."

Real-time monitoring and remote access is another important requirement for oil and gas applications. Kahoor sees real-time measurement of how operations are run 24/7 for upstream and midstream, including well-head monitoring, as highly critical. Oil and gas companies need to be apprised of the status of oil production regularly, to adjust production capacity where and when needed in the supply chain. During critical times, remote access and reporting are vital in controlling operations while identifying causes and resolving issues.

Other trends shaping satellite communications in the oil and gas sector are operations increasingly being conducted in extreme locations, often in harsh conditions. To address this, Intelsat has unveiled the IntelsatOne Flex offering, a customisable wholesale Mbps service that aggregates Intelsat's space segment, ground infrastructure and HTS platform.

This allows service providers to adjust their offering to deliver customers' bandwidth when and where it is needed, responding readily to surges and shifts in geographic demand. IntelsatOne Flex also delivers a predictable cost structure for accessing services, aligning operating costs with revenue generation activities.

"Intelsat also is focused on making access to satellite capacity and services easier than ever – for the oil and gas sector as well as other end users. For example, in January 2015, Intelsat and Kymeta announced an agreement to design and produce innovative, flat, electronically steerable Ku-band mTenna satellite antenna solutions optimised for Intelsat EpicNG. The new antennas will be easier to install, require lower power and have an improved form factor, delivering a range of benefits for oil and gas operations," says Emery.

Market Challenges

The recent fall in oil prices is hitting the industry hard, and tough decisions on cost-cutting measures are an industry-wide reality. Satellite communications have traditionally been viewed as an expensive necessity. However, technology innovations such as HTS are making satellite a more economical way to deliver invaluable connectivity and increase operational efficiency, thus reducing operational costs.

Oteifa explains: "Today, most oil and gas exploration and drilling activities are taking place in inaccessible geographical locations; some offshore locations might require a 24-hour boat ride, and the drilling itself is becoming more complex. This means that real-time monitoring and sensing is needed to constantly adapt to difficult and unexpected finds."

The market has been keen to constantly innovate and better equip vessels, platforms and rigs. There is now, more than ever, a need for reliable communications for a more diverse range of applications. This ultimately requires higher throughput.

"In addition to operating over 50 GEO satellites and O3b's MEO satellites, SES has made significant investment of over $1.2 billion in hybrid HTS satellites, and will develop products that can specifically address the evolving connectivity demands of the oil and gas industry.

"Depending on the customers' needs, our hybrid network of C-, Ku- and Ka-band satellites offers both high throughput spot beam and wide beam capacity as packaged

Satellite connectivity is a necessary means of communication on oilfields.

Fahad Kahoor, Director of Market Development for Energy, Thuraya.

"Security and pipeline monitoring applications are a growing concern in the energy sector. To address this, IoT [Internet of Things] applications can be leveraged for video surveillance to monitor operations in areas which are not easily accessible by teams"

FAHAD KAHOOR, Director of Market Development for Energy, Thuraya

solutions. These solutions offer flexible and scalable bandwidth at different times and with varying commitment, hence allowing us to address the industry's ever-changing connectivity needs," says Oteifa. Kahoor adds that L-band satellite technology is not affected by weather or any environmental changes, and has long been an attractive option for oil and gas operators in maintaining communications. Workers in remote locations can leverage the strength and capacity of L-band networks for uninterrupted connectivity, even when operating under extreme conditions.

He concludes by saying that Thuraya is driving future technological developments that have the potential of enhancing operational efficiency for energy companies, which are at the core of Thuraya's strategy. Thuraya will continue to invest in voice and data solutions that meet the energy sector's evolving demand for reliable voice connectivity and optimised data speeds at cost-competitive rates. PRO

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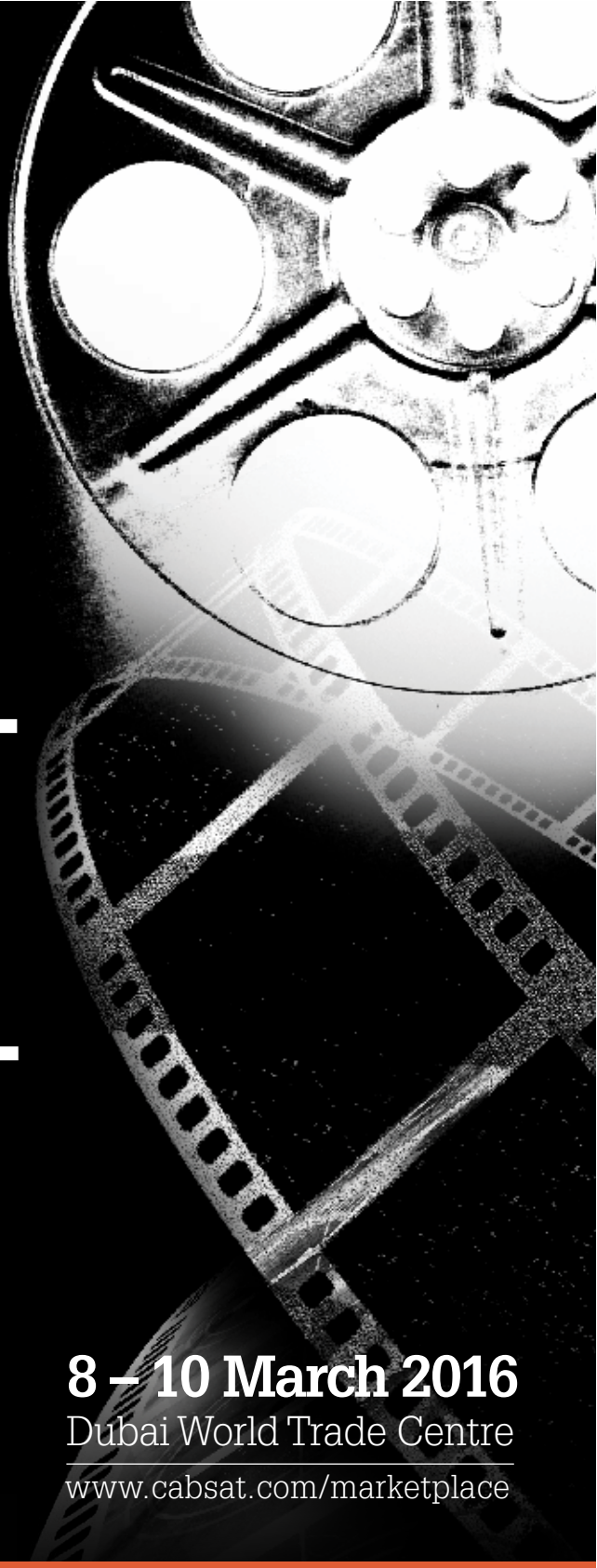

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Polarcus: Smart Marine Communications

Magnus Oberg, Vice President, Information Technology at Polarcus, a Dubai-based progressive marine geophysical company with an environmental agenda, explains why having customised, always-on, superior quality satellite communications capability on their seismic vessels is fundamental to the business

Today's maritime industry places increasing importance on the ability to communicate ship-to-shore seamlessly with broadband and the shift towards VSAT, as the preferred satellite communications service is becoming more pronounced each year.

In the oil and gas sector, real-time connectivity is vital for a number of major reasons – safety, accuracy, reliability and efficiency. For pure-play marine geophysical company Polarcus, the installation of Marlink's Sealink C-band VSAT service on its purpose-built, 3D seismic vessels was always a priority as it builds up its specialised fleet to meet the demands of offshore seismic exploration on a global scale.

Polarcus vessels use Sealink's C-band VSAT terminals for seamless connectivity.

The Provider

Marlink has long established itself as both pioneering and highly innovative within the competitive satellite communications industry. As early as 1976 it launched its Eik teleport in Norway, designed to provide communications to the North Sea platforms. For Polarcus, which has vessels operating around the world, working alongside a tier-1 satcoms provider which owns several teleports worldwide was a prerequisite to ensure quality of service and technical support.

Magnus Oberg, Vice President, Information Technology at Polarcus explains: "We wanted to use a high-end provider, with a long history and strong track record of working in the maritime business. As a global provider, Marlink's expertise and services matched our criteria as well as offering the product we needed."

Accuracy, Reliability and Stability

Customised to meet the technologically advanced requirements of the Polarcus fleet in terms of accuracy, the Sealink VSAT system includes dual C-band antennas with automatic switchover, dedicated full-duplex bandwidth through a Single Channel Per Carrier (SCPC) satellite link. The dual system also includes several LAN networks onboard, eight simultaneous voice lines and access to Marlink's highly advanced prepaid platform.

"When Polarcus is operating within a congested area, for example within vicinity of an oil rig, we need to be guaranteed the bandwidth we're paying for. The alternative services offered by many other providers would mean using a shared bandwidth and this would be detrimental to our operations," explains Oberg.

Polarcus needed a service which has full resilience coupled with the ability to operate out of normal trading routes, as seismic operations do not generally follow conventional maritime routes. These operations include routes into the polar region, where Ku-band is insufficient and a large antenna is required to stabilise the satellite link.

The Sealink VSAT therefore allows the

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Sandip Virk, Group Sales Manager, Broadcast and Satellite Division
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highest quality broadband connectivity and stability, ensuring a reliable service.

Environmental Agenda

Polarcus clearly recognises that the public debate on environmental matters is becoming increasingly vocal across the globe, with a corresponding demand for greater transparency from companies of all types. In response to these demands, the company is continually seeking ways to address and reduce its emissions both by design and through its operations. This commitment to reducing its environmental footprint is deeply rooted.

Oberg explains: "Taking active steps to preserving the environment during our work is one of the founding pillars of our company strategy, and as part of this we have consolidated our IT requirements as far as possible, and this is contributing significantly towards reducing the amount of power we use. As previously highlighted, seismic operations require a highly skilled crew to be onboard."

"However, should any technical difficulties arise, for example with the vessel engines, having the provision for remote diagnosis via internet detection through satellite can short circuit the need for costly call-outs and transportation from onshore, including the related high fuel usage.

"As part of this power-saving and environmental strategy, the distinctive Ulstein X-Bow double hull vessels we have commissioned also incorporate some of the most advanced navigation systems available today, and this ensures our exploration is expanded without harming the surrounding environment. The 'clean design' double hull helps control and limit operational emissions and discharges to air and water, as well as using diesel-electric propulsion, high specification catalytic converters and water treatment systems as well as fuel tank protection from grounding damage, handling of ballast water, fuel oil, sewage and garbage. Each vessel has environmentally friendly antifouling, controlled combustion machinery emissions and safe use of refrigerants. Polarcus also has a Green Passport Inventory for recycling the ships later on."

"During critical seismic operations, priority is given to office online requirements and crew internet capacity is reduced"

MAGNUS OBERG, VP, IT, Polarcus

Crew Welfare

The new generation of internet-savvy seafarers expect connectivity wherever they are, in order to communicate with the outside world. Having adopted a progressive approach to operations, Polarcus recognises the importance of its crew's welfare in order to retain the skilled crew required onboard seismic vessels.

By providing high-quality internet access through VSAT, they are in pole position to recruit and retain a first-rate geophysical team.

Oberg goes on to describe the approach taken by Polarcus. "Undoubtedly, there's been a huge shift in what is available to crew in terms of communications and entertainment onboard. It's only relatively recently that ship owners have begun to realise the importance of allowing crew to have access to the internet onboard, and there's an increasing drive for more bandwidth because of this demand, particularly amongst the more sophisticated ship owners, who want to attract and retain quality crew by allowing them the freedom to keep in contact with friends and family."

"Social media chat platforms such as Facebook demand even more bandwidth than email, and from our experience, providing internet access for social media, as well as online services such as personal banking, is perhaps becoming even more important than television. The internet has really become a very important part of onboard crew life, and this is another major benefit of using Marlink's VSAT.

"Obviously, during critical seismic operations priority is given to office online requirements and crew internet capacity is reduced, but only temporarily. From an IT perspective, we are able to operate in essentially the same way as an onshore office – that's the whole point really of paying for a quality service like VSAT."

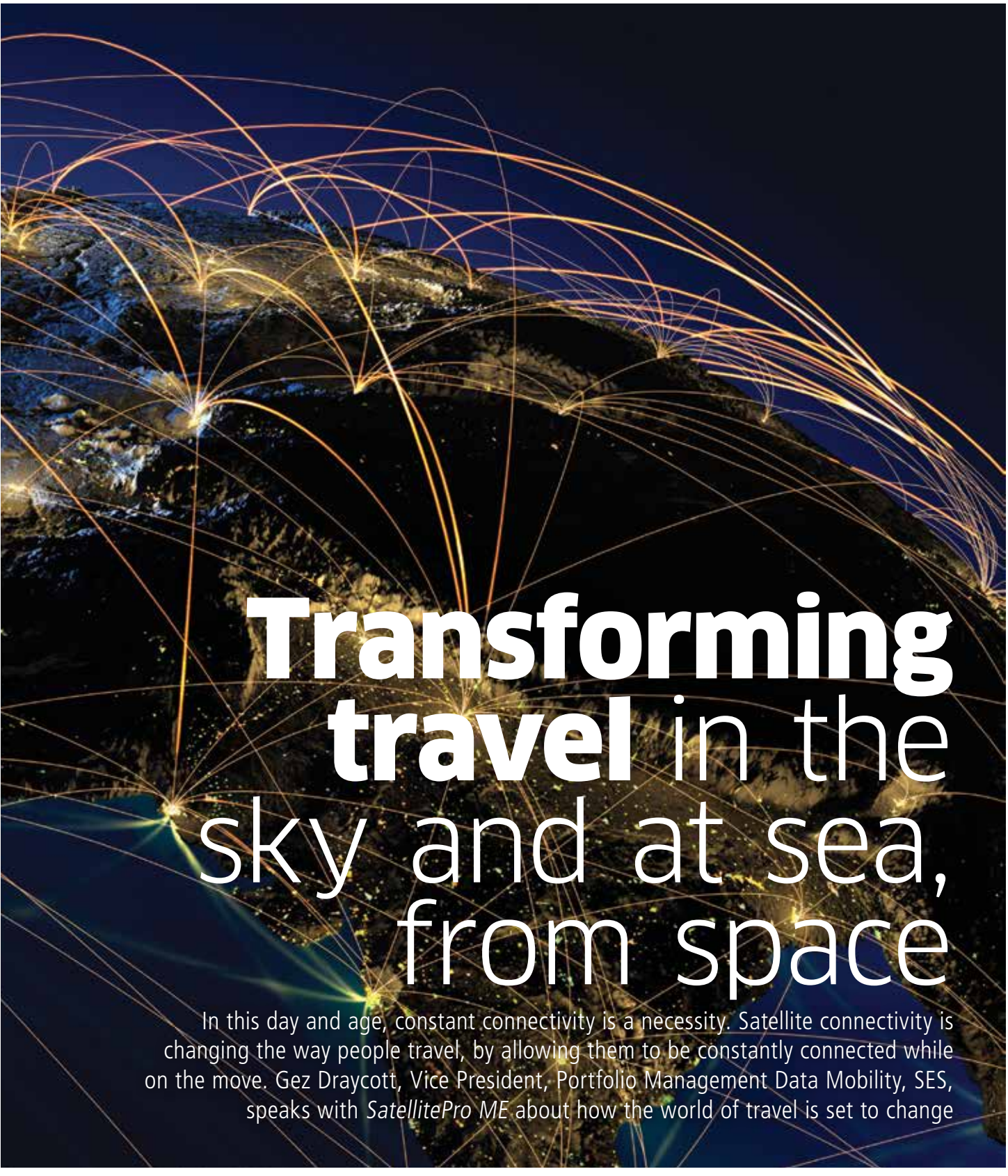
The Future

Polarcus has extended its global VSAT contract with Marlink for a further three years. The contract includes ongoing provision of reliable voice and data connectivity through Sealink, Marlink's C-band VSAT solution for Polarcus' fleet of seismic vessels. This year, the fleet will also be migrated from a dedicated configuration to a shared non-contended configuration, using the new iDirect X7 modem to benefit from more dynamic bandwidth allocation to optimise connectivity.

As part of the contract extension with Marlink, Polarcus will continue to receive reliable global VSAT coverage while benefiting from a faster link, with an increased Committed Information Rate (CIR) of 512/1536Kbps and a Maximum Information Rate (MIR) of 1536/3096Kbps. Possible through the move to iDirect X7, the MIR is a burstable bandwidth increase, ensuring that Polarcus, in addition to its guaranteed IP connectivity, always has potential for more throughput if available at the time.

"Sealink VSAT has become integral to operational efficiency and crew welfare on board Polarcus' seismic fleet, and is also important to help the company to future-proof its operation," says Tore Morten Olsen, Head of Maritime Satcom in Airbus Defence and Space.

"We're delighted that Polarcus has extended its contract, a move that reflects our commitment to offshore vessel owners and operators in the Middle East and globally." PRO



Transforming travel in the sky and at sea, from space

In this day and age, constant connectivity is a necessity. Satellite connectivity is changing the way people travel, by allowing them to be constantly connected while on the move. Gez Draycott, Vice President, Portfolio Management Data Mobility, SES, speaks with *SatellitePro ME* about how the world of travel is set to change

To the millennial generation, always-on connectivity – at any time, and from anywhere – is seen as an absolute necessity, whether for checking emails on the way to the office, connecting with friends on Facebook, posting pictures on Instagram or watching a YouTube video at the local café.

Yet these expectations don't extend evenly across all facets of the consumer's life. When the same person takes a flight across the Alps, or steps onto a cruise ship bound for Hawaii, connectivity is at best chancy, at worst non-existent. And that's highly frustrating for a generation that demands to live seamlessly across both physical and digital worlds.

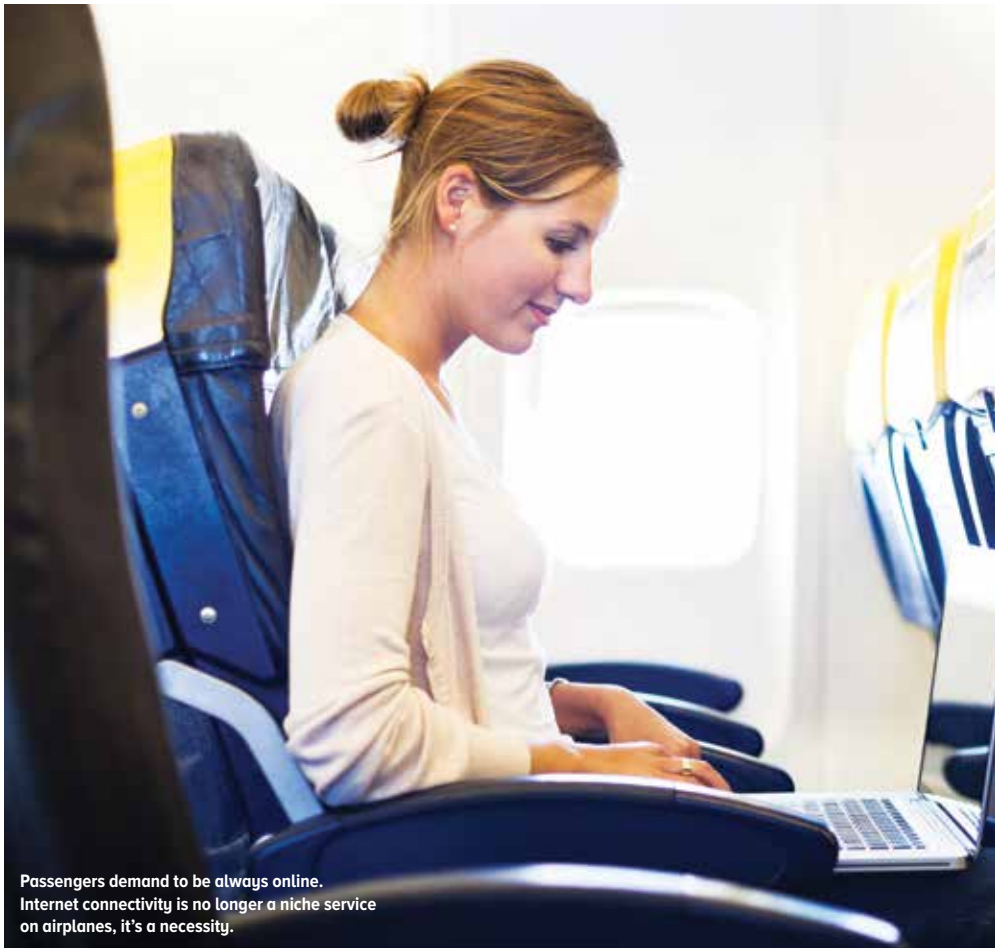
So it's no surprise that players in the maritime and aeronautical industries are waking up to the massive opportunity that this pent-up demand creates. According to NSR's latest Aeronautical SatCom Markets report, in 2016, 3.6 billion passengers are expected to fly across countries, continents or oceans, growing by about 6% each year. Boeing and Airbus are forecasting demand for at least 2,200 new aircraft annually over the next 20 years.

The maritime industry is also seeing solid growth. As of 2014, there was a total of 349,540 seafaring vessels, and that number is projected to grow to 445,210 by 2024, based on NSR's Maritime SatCom Markets report in May 2015. Last year, Comsys estimated that cruise liners ferried more than two billion passengers in 2013 alone.

To put that in context, that's an average of 9.8 million people in the sky and almost six million at sea every day – and growing – who need to satisfy their craving for apps, data and connectivity, at the same levels of speed and capacity they already enjoy at home or in the office.

How can satellite operators help businesses in the aeronautical and maritime markets tap into this opportunity? By combining insight, creativity, imagination and intelligent partnerships, we can ensure that these demands are met competitively and effectively.

Right now, the industry is launching a new and innovative generation of satellites capable of at least doubling – and in some cases tripling – the capacity that can be delivered over traditional fixed satellite services (FSS). The launch of such high-throughput satellites offering Ka-band and Ku-band capacity heralds a new era of pricing flexibility, upending the economics of the industry. With abundant bandwidth, we have the option of selling capacity to a greater number of users – at a significantly higher throughput rate – for lower latency and cost.



Passengers demand to be always online. Internet connectivity is no longer a niche service on airplanes, it's a necessity.

Operators can also offer the flexibility to mix and match a combination of regional and global beams for broadcast/multicast applications serving low-density traffic zones, and narrow spot beams for high-capacity broadband communications serving dense traffic zones such as major shipping or flight routes.

Airlines and ship operators can take advantage of these capabilities to offer their customers a broad range of service packages, from free and low-priced services to premium packages.

As an industry, we're working with manufacturers and airlines to develop consumer-friendly onboard technologies that allow in-flight connectivity and entertainment. We're also partnering with major aeronautical service providers such as Global Eagle Entertainment, Panasonic and Gogo to forward development of these exciting new markets.

We have applied the same creative approach to the sea. For instance, by combining GEO and MEO capacity, a unique offering in the satellite industry, we can provide comprehensive mobile coverage that offers massive throughput (up to 1Gbps) to follow a ship as it travels at sea, with speeds and latency equal to that of any terrestrial fibre service.

A recent beneficiary has been Royal Caribbean's Quantum of the Seas, dubbed

Gez Draycott, Vice President, Portfolio Management Data Mobility, SES.

"the smartest ship at sea". Guests enjoy an ultra-high bandwidth connection greater than that of all other cruise ships in the world combined, delivered over O3b, an exciting MEO venture in which SES has a significant stake. Thanks to this super-fast connection, Royal Caribbean is also showing what's possible for the cruise industry by implementing innovative applications such as RFID luggage tags that track luggage in real time through smartphones, and a mobile app that empowers guests to manage every detail of their vacation during the cruise.

Finally, to underscore just how seriously we view the opportunities in the mobility sector, SES alone is investing some one billion euros in three new Ku-band high throughput satellites in the coming years.

Our aim is high. We want to enable bandwidth-intensive applications to be delivered anywhere, anytime in the world as a basic necessity of life, whether a person is sitting in the office, or in a commercial jet 35,000 feet in the air, or on a cruise ship plying the route from the Horn of Africa to Australia.

"Operators can also offer the flexibility to mix and match a combination of regional and global beams for broadcast/ multicast applications serving low-density traffic zones, and narrow spot beams for high-capacity broadband communications serving dense traffic zones such as major shipping or flight routes"

GEZ DRAYCOTT, VP, SES

Today, modern high-capacity satellite systems are the only viable answer to insatiable digital cravings in the sky or at sea. When it's time for the connected generation to fly or sail the world, their desire to live in both the digital and physical worlds simultaneously are satisfied solely because of the presence of the satellite.

As William Shakespeare once wrote: "It is not in the stars to hold our destiny but in ourselves." We in the satellite industry have continuously demonstrated that we can scale and evolve with the times, whatever the latitude, longitude or altitude. And the future is bright. PRO

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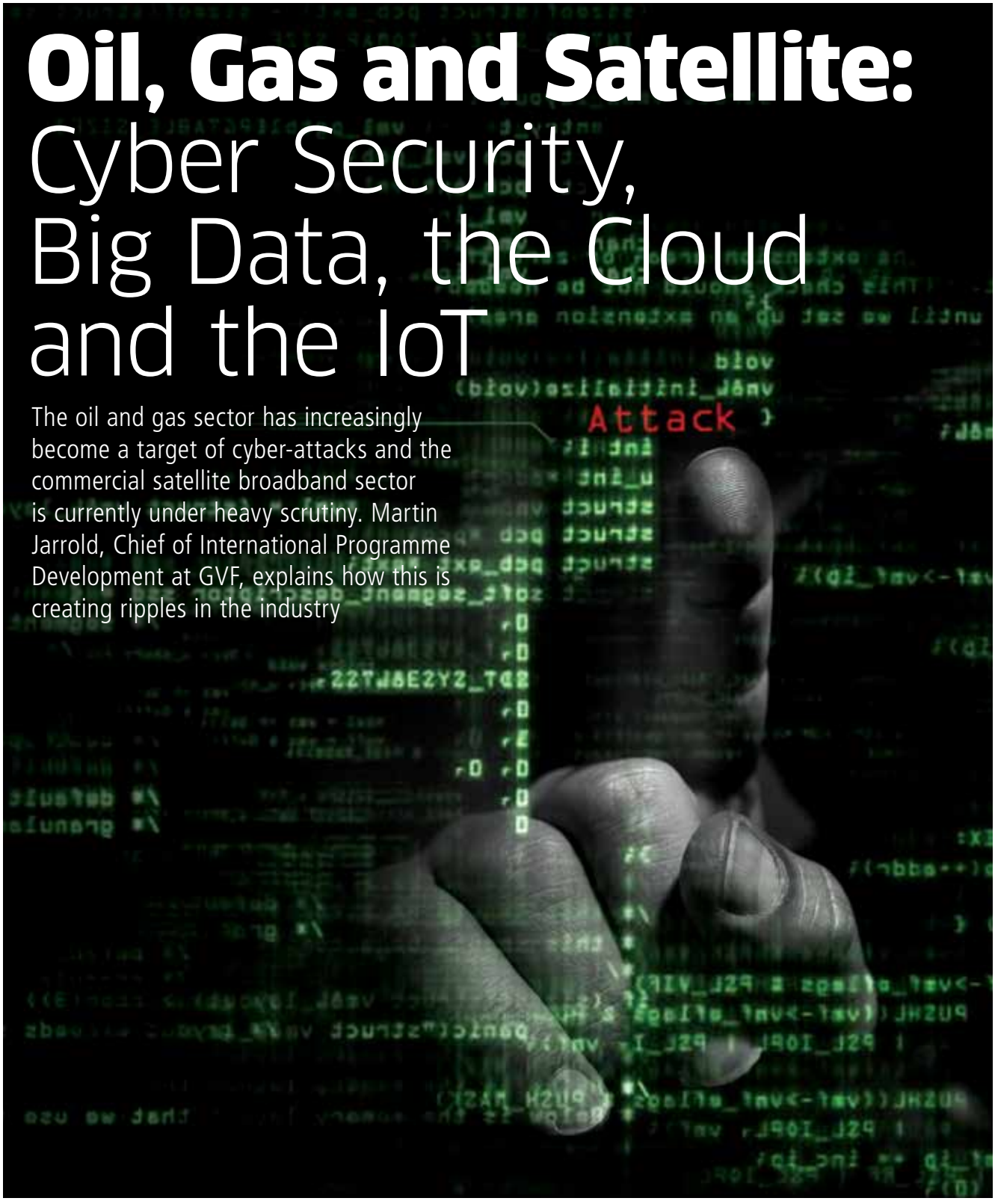
Oil, Gas and Satellite: Cyber Security, Big Data, the Cloud and the IoT

The oil and gas sector has increasingly become a target of cyber-attacks and the commercial satellite broadband sector is currently under heavy scrutiny. Martin Jarrold, Chief of International Programme Development at GVF, explains how this is creating ripples in the industry



"It is critical that oil and gas companies maintain capital investment in respect of managing cyber-security risk"

MARTIN JARROLD, Chief, International Programme Development, GVF

Cyber-attacks are a very grave threat to the oil and gas sector.

In the modern, digitally inter-connected world, no part of industry, commerce, government, civil society or, less directly, the individual internet user as a customer of online services, is exempt from the constant threat and frequent actuality of cyber-attacks. Targets include banks and financial institutions; healthcare facilities; utilities and other critical infrastructure; oil, gas and petrochemical upstream and downstream facilities; retail and consumer databases; vehicle and other mobile asset-tracking systems; telecommunications service providers; and the satellite industry.

Volume, as well as variety and sophistication, makes it difficult to achieve 100% prevention of cyber-attacks, but networks must be made resilient enough to bounce back from attacks instantly. These efforts mean that, collectively, the actors in the cyber-crime space are forcing massive expansion in the cyber-security industry. The current global market is estimated to be $80bn, forecast to increase to over $140bn by 2019.

The oil and gas sector – critically and increasingly dependent on an ever-more complex ICT infrastructure – has been the target of well-known cyber-attacks. The commercial broadband satellite industry – a key networking communications solution provider to the oil and gas industry across its upstream, midstream and downstream segments – is currently subject to a greater degree of networking security-related scrutiny than ever before. These two industries have a clear customer and provider common interest in working to ensure that cyber-security prevails.

The oil and gas industry's constant preparation for, and need for vigilance against, the threat of cyber-attack must not be compromised by any infrastructure and systems security investment budget caps that may follow from the ongoing price per barrel oil market slump. The most famous cyber-attack on the oil and gas industry happened in 2012, when the price of a barrel of oil was circa $85, when 30,000 computers in Saudi Aramco's network were crippled by an attack by the group Cutting Sword of Justice. The operations of the largest oil producer in the world were disrupted for months, but although the terrorists failed to actually stop oil and gas production, the attack was one of the most destructive cyber-security strikes against a single business.

During the current, or any other, downturn, it is critical that oil and gas companies maintain capital investment in respect of managing cyber-security risk exposure. Reliable and secure data enables oil and gas companies to make key decisions. Now, more than ever, that data needs to be protected.

Thanks to accelerating advances in ICT,

the oil and gas industry has been able to automate many of its processes to ensure a safer, more cost-effective approach to exploring for, producing and distributing energy resources. Companies have been able to significantly reduce costs through replacement of many inefficient manual processes, but with automated equipment controlled through the internet, there needs to be a greater focus on network security. The evolution of cyber-threats and the exploitation of data vulnerability is escalating, and the proliferation of sophisticated efforts by malicious state, terrorist and economic actors to steal and monetise corporate data or leverage it to assert power, track trends and behaviour, or cause physical disruption in operations, is a growing concern in the energy industry, in which critical infrastructures and processes are managed remotely from central control centres.

Centralised process and systems control in the oil and gas sector is strategically dependent on global satellite communications, an industry that – as noted above – shares in the fight to preserve cyber-security. In 2014, the GVF, the satellite industry's only global representative body, established its Cyber Security Task Force (CSTF) as a coordination centre for satellite security knowledge. Following a not insignificant volume of print and online media reports about satellite networks security, beginning around mid-2013, a February 2014 GVF press release noted that the satellite industry required a "global initiative to address escalating cyber-security threats with the establishment of a task force that will identify best practice and provide guidance on how users and industry can optimise the application of VSATs to reinforce network integrity."

Essentially, the CSTF is encouraging equipment vendors and network operators to implement robust protection measures, abandoning widely discredited practices where they still exist. Further details of the work of the CSTF are available by contacting the Task Force chairman, and in the first instance by contacting me at martin.jarrold@gvf.org.

The security of oil and gas critical infrastructure ICTs brings together three facets of the modern digitised world:

- **Big Data** – The continuous churn of enormous amounts of information being gathered and sifted for specific purposes.
- **Cloud computing** – The online storage and repository of this data using massive networks of computing resources, with less information stored on local hard drives and more data aggregated together and hosted on servers somewhere on the planet.
- **Internet of Things (IoT)** – The all-things-connected phenomenon – forecast to encompass nearly 50 billion connected devices by 2020, with an average of more than six connected devices per person – gathering this data.

Big Data (from Big Oil)

Despite the negative impact of current market conditions, we are still in the era of Big Oil. As today's digital oilfield increases in sophistication, we have Big Data – solutions and services to store, manage, protect and analyse information extracted from the large volume of data streams generated by the oil industry. These streams come from such sources as drilling equipment, seismic sensors and security application installations, with much increasingly generated from the rapidly expanding satellite communications/ Machine-2-Machine (M2M) interface.

The Cloud – Applications and Connectivity Imperatives for the Digital Oilfield

The digital oilfield brings together cloud server applications which facilitate the transfer of oil/gas field IT infrastructure, and IT personnel expertise, away from multiple offshore, remote locations to centrally located headquarters/regional offices. This supports fully integrated operations which comprise always-on, real-time well-head/ drilling measurements and data networking/ sharing, along with video-based equipment and instrument monitoring, video-based remote surveillance for safety and security, and video conferencing. Additionally, it encompasses components of crew welfare/ training, and also Bring Your Own Device (BYOD) environments, and it is also linked with the prioritisation of mission-critical traffic flows over less critical traffic.

IoT in Oil and Gas

In covering the above facets of cyber-security, the interface and synergy of M2M communications and satellite communications will also comprise part of the Kuala Lumpur Meeting subject-matter. The IoT will be the ultimate realisation of a future universal M2M environment which will far exceed the potential boundaries and limited scope of even the greatest reach of a legacy supervisory control and data acquisition (SCADA) systems environment.

The IoT will bring ubiquitous computing and an integrated digital and physical world. Improved sensor device capabilities will facilitate business logic at the edges of networks, with decision-making based on real-time readings from sensor networks. Satellite M2M is growing fast, and the aggregated target markets make its potential for the satellite industry very important. PRO

Keeping the **Skies Safe**

Inmarsat has trialled advanced flight tracking systems on Qantas Airways and Virgin Australia flights, using ADS-C to pinpoint the location of an airplane every 15 minutes

Inmarsat has finalised an important safety evaluation alongside Airservices Australia. The evaluation assessed improved flight tracking services on commercial airline flights operated by Qantas Airways and Virgin Australia to and from Australia, using existing satellite communication capabilities.

The results of the trial, published in a comprehensive report delivered to the International Civil Aviation Organisation (ICAO), provide important guidance to the global aviation industry on ways to meet the flight tracking requirements outlined by ICAO in February this year. Copies of the report have also been provided to the International Air Transport Association (IATA) and the Civil Air Navigation Services Organisation (CANSO).

The trial supports ICAO's efforts to enhance global flight tracking in coordination with aviation industry stakeholders, governments and other related specialists. Earlier this year, the UN agency issued a resolution that will require commercial aircraft to report their position on a minimum 15-minute basis from the end of 2016, compared to the current standard of 30-40 minutes. The reduced interval is designed to ensure air traffic control has a more accurate view of aircraft positions and can respond to potential incidents in a more timely manner.

In response, Airservices Australia and Inmarsat launched a joint initiative to determine if existing ADS-C capability could meet ICAO's normal tracking requirements in oceanic airspace without affecting airline communications costs or operational efficiency. ADS-C is a proven technology that establishes links between aircraft and air traffic control systems to provide information such as an aircraft's position, speed, altitude and direction of flight. It is routinely used over oceanic or remote areas.

"Ongoing monitoring of the Inmarsat satcom network continues to confirm that the increased message frequency has had negligible impact on the network and total ADS-C messages. This represents a neutral or minimal cost impact, and at the same time, we have not experienced any deterioration in ADS-C communication performance"

CAPTAIN MARY MCMILLAN, VP, Inmarsat Safety and Operational Services division

The trial was conducted in carefully managed phases to better monitor data communication loads and performance. Evaluation commenced on 30 January, 2015 over oceanic airspace in parts of the Brisbane Flight Information Region (FIR), followed by expansion to all of northern Australia and Honiara and Nauru oceanic airspace in April. Airways New Zealand joined the evaluation in May, with the coverage area expanded once again to include the Melbourne flight information region.

By the end of the trial, aircraft across all oceanic airspace managed by Australia were being tracked. A minimum reporting rate of 14 minutes was established to allow the application of a reduced separation standard, while maintaining a good balance between system limitations, costs and monitoring requirements during normal operations.

"The evaluation was a success and met the ICAO-defined requirements and regulatory performance criterion. Ongoing monitoring of the Inmarsat satcom network continues to confirm that the increased message frequency has had negligible impact on the network and total ADS-C messages.

"This represents a neutral or minimal cost impact, and at the same time, we have not experienced any deterioration in ADS-C communication performance," said Captain Mary McMillan, Vice President of Inmarsat's Safety and Operational Services division.

Based on the results, Airservices Australia has now adopted the 14-minute reporting requirement as standard operating procedure in oceanic airspace. In addition, other air navigation service providers (ANSPs) have commenced evaluations as a result of the successful Australian trial. PRO

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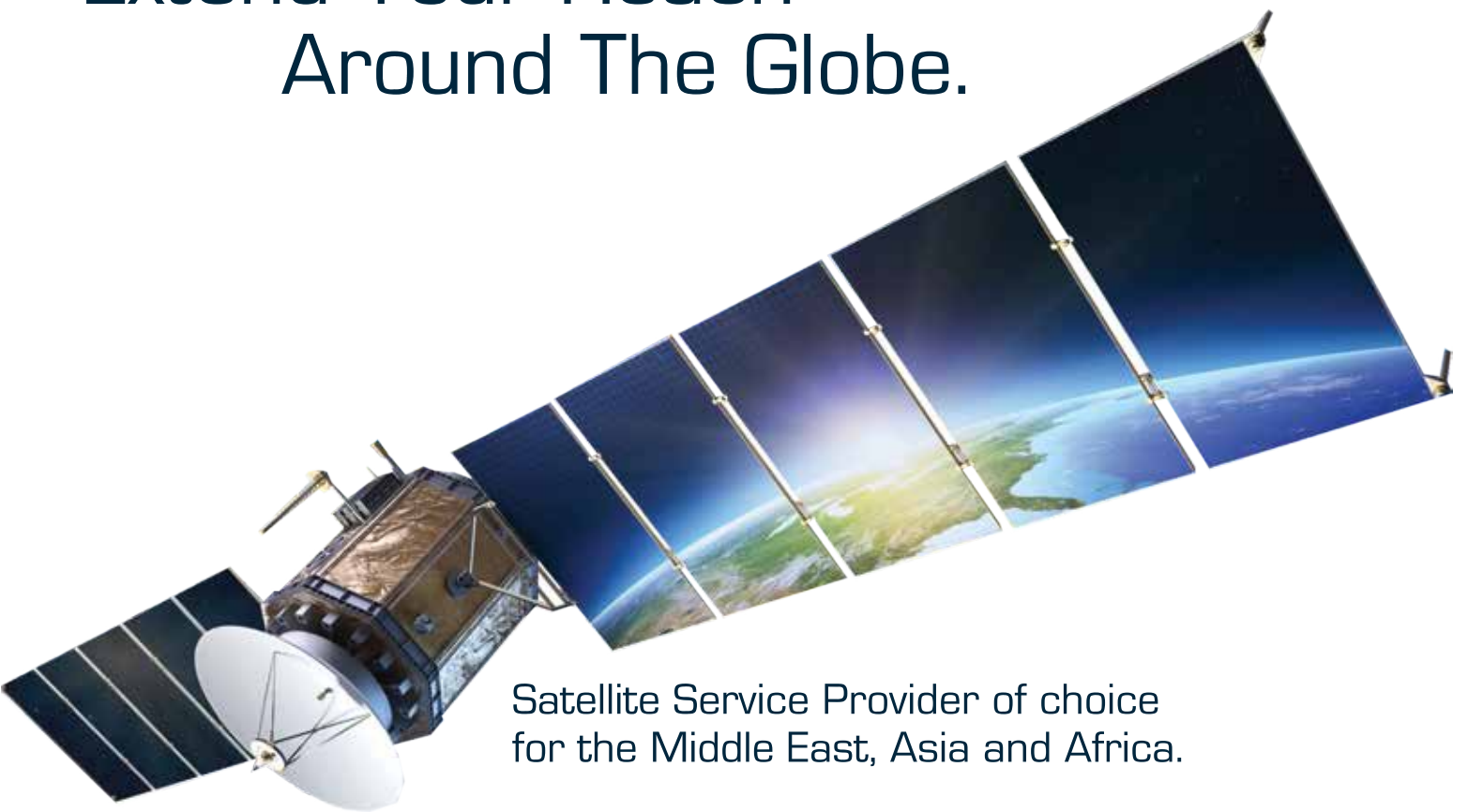

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