



MARKET BRIEFS

**Executive summaries of market trends and opportunities
in key market segments and regions worldwide**

The Oil and Gas Market for Satellite Services

Oil and Gas Highlights



- The oil and gas sector is increasing its use of video streaming for operations monitoring and crew welfare.
- NSR, expects almost 17 Gbps of demand from oil and gas end-users on High Throughput Satellites (HTS) by 2022, with growth taking off in a big way in 2017.
- There is an increasing demand for satellite technology to connect remote exploration sites to the communication network and head office.

by **Virgil Labrador, Editor-in-Chief**
Satellite Markets and Research

Oil and gas are among the most essential commodities in the modern industrialized world. Oil powers everything from the cars we drive to the electricity in our homes. The emergence of newly industrializing countries in Asia, Africa and Latin America has only serve to drive up demand for this important commodity. Thus, oil production and exploration has been at historical highs. Maximizing the successful operation of the oil & gas rigs of the future will depend on bandwidth usage level of 100 times that of today.

This was the analysis of Brastrading, the Florida, USA-based company which provides engineering and high-level logistics, services, equipment and

worldwide telecom solutions for the oil & gas market. Multi-path communications, applications-aware networks, universal device IP-connectivity – all be required to improve rig on-board situational awareness, enable faster decision-making, facilitate real-time remote control, increase automation, lower operating costs, and create a safer working environment. This analysis was presented during the GVF Oil & Gas Communications Brazil 2014: Big Oil, Big Data: The Deepwater Ocean Ex-pansive conference which took place in Rio de Janeiro last April 2014.



Crew welfare, mobility solutions, the ability to monitor and control remote equipment and processes, among others, are driving demand for satellite services in the growing oil and gas industry.

Research firm NSR projects global Oil & Gas satellite revenues will grow from approximately US\$ 600 Million in 2010 to US\$ 975 Million in 2020, yielding total retail revenues of nearly US\$ 8.8 Billion over the ten-year period.

This growth will be driven by new technologies such as High Throughput Satellites (HTS), and the push of Oil & Gas operations into remote envi-

ronments where satellite is the only game in town.

Going Deepwater

There are large amounts of known but unproven oil reserves throughout the world, but most can be found in deeper waters further away from shore and beyond the reach of terrestrial communications options said Blaine Curcio of NSR. This presents a unique opportunity for satellite service providers.

With Deepwater Horizon behind the Oil & Gas Industry, companies now have renewed interest in continuing to expand exploration and production plans, and increasing the capacity to deliver crude or natural gas products from production site to their final markets. Oil & Gas companies continue to look for the 'next big thing', both in deeper waters and northern climates. As terrestrial solutions continue to penetrate the traditional markets, these 'next big things' will be where satellite-based solutions dominate, said NSR.

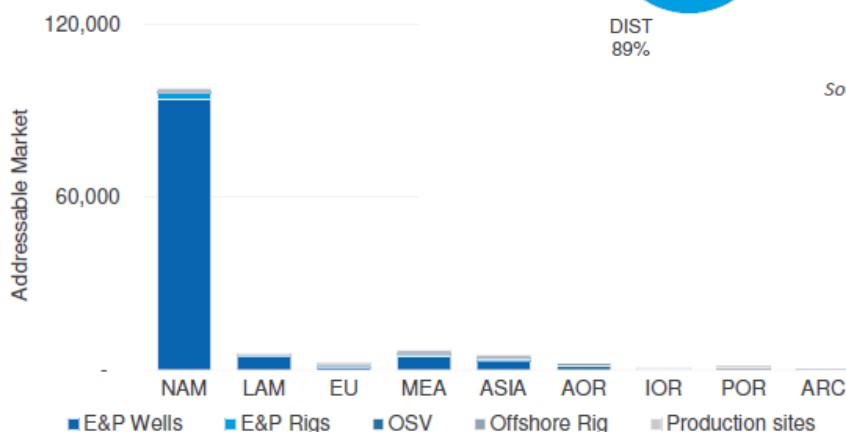
According to the "Global Satellite Communication Market in the Oil and Gas Industry 2014-2018" report, there are currently 135 Ultra Deep Water (UDW) rigs in operation in the Atlantic Ocean. The number of UDW rigs is expected to reach 220-230 units by 2018. Geographically, these rigs will be placed in very risky offshore locations such as in the Indian Ocean, the Pacific Ocean nearer to China, and the Atlantic Ocean nearer Canada and Greenland.

UDW is a very complex exploration process that requires very high safety as well as efficient operational performance. In addition, it requires a large amount of integrated real-time process automation associated with high risks. Hence, UDW rigs require highly reliable broadband networks. Further, as the UDW market is expanding, there is a need for robust and remote communication services in new areas. Thus, satellite communication for UDW exploration is an emerging segment that is expected to propel the growth of the market.

According to the report, one of the main drivers in this market is the challenging environment of oil and gas rigs. Most of the oil and gas exploration and drilling works are carried out in remote places such as deserts, where the temperature shifts from -10 degrees Celsius to almost 50 degrees Celsius; offshore oil and gas drilling rigs, where wind, rain, and waves make for an incredibly hostile workplace; and deep-water oil and gas exploration, where the depth plays a hostile environment.

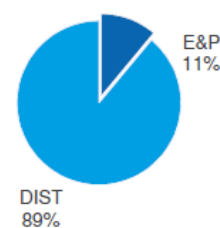
Further, the report states that one of the major challenges in this market is the increasing adoption of fiber optic connectivity. Most of the E&P compa-

O&G Addressable Market: E&P



Source : NSR

O&G Market Addressable Market



Source : NSR

nies are adopting fiber optics communication as an alternative to satellite communications. In addition, many companies with onshore rigs are adopting terrestrial fiber optics connections for backup networks during emergency situations. Recently, BP rolled out a 1,280-kilometer fiber network in the Gulf of Mexico.

Terrestrial penetration in the Gulf of Mexico and the North Sea reduces the value proposition of satellite-based solutions," stated Claude Rousseau, Senior Analyst with NSR, "yet, places without terrestrial solutions will be where satellite players see the largest growth, mainly in deep water or northern latitude markets." Along with terrestrial penetration, increases in regulation and a slowdown of new discoveries also limit overall growth

in traditional markets.

The high initial capital outlay for undersea fiber networks limits its reach to oil rigs closer to shore, and only for those that plan to be in operation for many years, according to Eric Jan Bakker, Head of Sales, Asia-Pacific of Airbus, which provides satellite services to the maritime sector.

Some Key Markets

NSR's newly released Energy Markets via Satellite, 4th Edition finds a challenging market for Arctic-based Oil & Gas satellite connectivity services. Even as more attention continues to move towards the Arctic – for both the transportation of petroleum via tankers through the Northern Sea Route or Exploration & Production activities from oil and players – the market does not provide a green light for widespread satellite communication solutions as found in other areas such as the North Sea, Gulf of Mexico, or the shale-plays in the lower 48 states.

"While oil and gas majors invest in the mineral and development rights throughout the Arctic, and dedicate capital and

resources to the region – the limited time-frame for activities, extremely harsh operating conditions, and ongoing environmental concerns pose significant barriers to the overall O&G industry in the Arctic,” states report author and NSR Senior Analyst Brad Grady. “These issues all trickle-down into the planning cycles for satellite operators and communications service providers who continue to look at the Arctic as a potential – but cannot yet see a green light for widespread investments of coverage and capacity.”

Although providing double-digit growth opportunities for those systems that have coverage, and providing a 3x increase in the number of In-service units providing MSS-based communications solutions, by 2023 the total Arctic market opportunity is projected to be approximately 100 In-service MSS units. Compare that to the next smallest region – the Indian Ocean at 5,000 In-service Units – and the Arctic remains an interesting proposition, but not enough to sustain widespread dedicated focus.

While Oil & Gas development will occur in the Arctic, technically recoverable resources still exist in areas with longer operating windows, better known environmental management practices, and greater access to logistical support such as satellite communications. An on-going maturation in the North Sea and Gulf of Mexico shifting activity into Latin America and Asia-Pacific will be larger growth drivers for energy market communications providers than a shift into the Arctic. In a global market of almost 170,000 In-service units just in the Oil & Gas sector alone, the Arctic is and remains an extremely small niche opportunity for satellite communications.

“The energy boom is raging across North America – from the Gulf of Mexico and

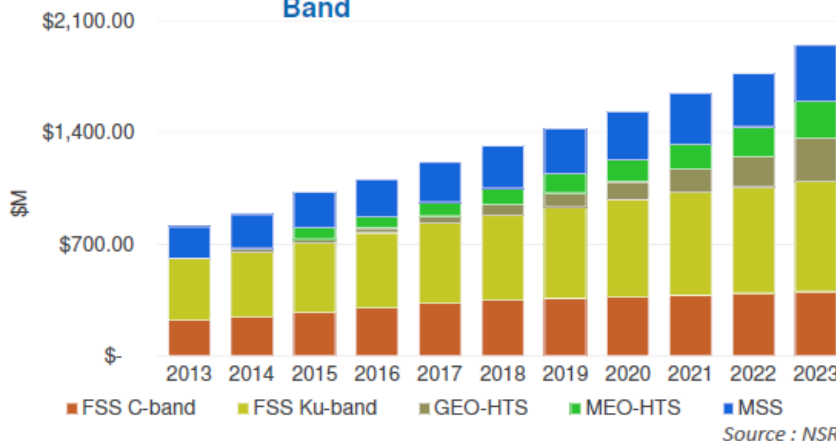
“...This growth will be driven by new technologies such as high throughput satellites (HTS), and the push of Oil and Gas operations into remote environments where satellite is the only game in town...”

Texas to North Dakota and beyond, and it’s very exciting to see SES satellites playing an increasingly critical role during this historic time in the region. New shale operations, for example, are growing rapidly and these shale energy production firms need to connect their remote teams and facilities to headquarters like never before as part of a huge push for mobility capabilities. Whether a

delivered over our spacecraft. That allows crews aboard oil and gas drilling rigs to communicate with colleagues at headquarters or friends and family back home from the middle of the Gulf of Mexico or some of the most remote inland locations on earth. People want their laptops, mobile phones, and their social media services to work no matter where they are, even aboard exploration vessels at sea,

and oil production facilities in the middle of nowhere. We’re working with companies like Rignet, ITC Global, Harris Caprock, GDS and SageNet/Spacenet to turn that vision of a connected drilling rig or oil pipeline into reality in some of the most isolated and challenging locations anywhere. It’s rewarding work that is really driving efficiencies and streamlining operations across the oil and gas industry,” said SES’ Sikorski.

Energy Markets O&G Total Retail Revenues, by Band



crew needs to connect to the corporate network or they simply want to Skype with the family back home, satellite is making it happen. The demand for satellite capacity is at an all-time high, as oil and gas production in the U.S. is now ranked third in the world. Younger drilling crews want to be connected like never before,” said David Sikorski, Sales Director of satellite operator SES, who focuses on the oil and gas and maritime markets.

Applications

“Our satellite fleet is perfectly positioned to enable seamless connectivity throughout this region – everything from high-speed broadband and Internet access to high-powered data and voice services are

Crew Welfare is one of the key applications for satellite VSAT networks in the oil and gas industry. Crews in oil platforms and rigs deploy for weeks or even months at a time in relative isolation and more and more of them are demanding the same level of connectivity as they get when they’re on land. This applies as well for those working in remote land locations which are not served by terrestrial networks. Crews not only expect to be able to send e-mails, but watch streaming videos or do video calls. All these require satellite bandwidth.

Another key application is broadband connectivity to extend reach of corporate networks and support two-way communications. Today’s oil rigs and platforms operate like virtual data centers which can

be remotely controlled and providing real-time transmission of drilling data and other key monitoring indicators. The sophistication of communication networks in remote sites have given rise to the emergence of “Digital Oilfields.” Oil and companies now require always-on, high-speed broadband connections for access to Supervisory Control and Data Acquisition (SCADA) as well as video monitoring of operations and risk and damage assessment.

“Mobility is driving the need for and the development of a new generation of applications aimed at enabling the oil and gas industry, with mobile devices at its fingertips, to monitor and manage oil and gas operations from anywhere in the world. This has changed everything. No longer are crews tethered to big machines to monitor the pressure and flow through an oil pipeline crisscrossing the country. Now they can manage the vital signs of a pipeline network or a drilling operation in the middle of Alaska, North Dakota or the ocean with SES’ satellite spot and broad beam technologies built into our fleet of 50-plus satellites,” said SES’ Sikorski.

Mobility beams like those aboard the SES-6 satellite also enable exploration vessels at sea to remain seamlessly connected – even as they venture from one region into another. As the oil and gas markets demand more sophisticated communications capabilities, satellite operators such as SES and others such as Intelsat with its forthcoming EPIC satellites and Inmarsat’s Global Express and O3B network of Ka-band satellites are well positioned to deliver on these demands with high-throughput satellites and high-powered coverage designed to enable communications on the go.

Field Deployments

To cite an example of satellite networks for the oil and gas industry, Hughes has extensive experience in supplying highly reliable network solutions in support of SCADA applications. Hughes has provided services to industry leaders such as BP Pipeline, Shell Pipeline, Marathon Pipeline, and Tepeco.



C-COM antennas used in mobile vehicles at a remote gas site.
(photo: C-COM Systems)

In Hughes’ experience, no matter where a pipeline or transmission line runs it is vital that all SCADA points can be monitored and commanded at any time of the day. This requirement is driven by both economic needs as well as security and environmental demands. It is simply unacceptable to lose connectivity.

SCADA applications have very high traffic Quality of Service (QOS) requirements. Seconds are vital in making a decision regarding the control of a pipeline or transmission line. The communications solution must be able to both quickly (and consistently) provide accurate real time monitoring but in the event of an anomaly the operator must be able to effectively send commands quickly and with certainty. Low latency and consistent (predictable) response times are important elements in a successful solution.

The very nature of pipelines and transmission lines is that they run through very remote and harsh geographic areas. Often there is no shelter and AC power is not always present or reliable. The right solution must be able to adapt to these conditions.

Due to the fact the remote locations are in isolated areas it can be difficult and time consuming to get a technician to the remote SCADA site. The communications solution must be robust and the service

provider must provide a service which enables zero down time even for maintenance windows, according to Hughes.

Another example of satellite equipment used in oil and gas applications is C-COM’s iNetVu®. The first larger volume orders for the iNetVu® mobile Internet & satcom VSATs came from the oil and gas industry following extended testing of the units under extreme climate conditions in many parts of the world.

In addition to providing basic broadband Satcom (satellite communications), the iNetVu® systems also deliver Voice over Internet Protocol (VOIP) solutions, SCADA (Supervisory Control And Data Acquisition) connectivity, remote video feeds and of course email and web browsing.

Some of the VSATs are mounted on independent support vehicles, some on the rigs themselves and some are transportable VSAT (antennas in cases) that can be deployed from the ground. Over a period of time, the iNetVu® mobile VSAT has been customized to fulfill the rigorous reliability and durability requirements of the oil and gas industry’s satellite communication needs.

The North American Market

The three countries comprising North America: the United States, Mexico and Canada are all major oil producing coun-

Providing Customized Solutions

In the demanding world of oil and gas, off-the-shelf solutions are not enough

When Harkland needed a customized communication solution for its ships, it turned to service provider ITC Global for a custom engineered satellite communications solution that is tailored to the unique requirement of their vessels.

Harkland is one of the few inspection, repair and maintenance world players able to provide clients with a true one-stop shop service including engineering, project management, ROV services, diving, survey and operating a fleet of high-quality offshore support vessels. They currently operate in four distinct regions across the globe: Africa/Middle East, Asia-Pacific, Europe and North America.

Requirements

Harkland needed to extend broadband communications for multi-regional locations and upgrade all onboard satellite technology. It also needed a secure connection to corporate network.

Solution

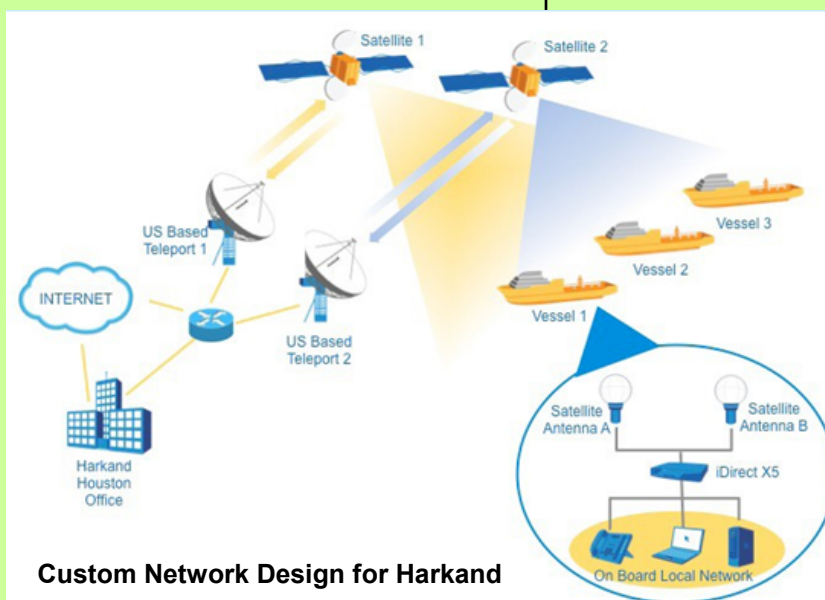
ITC Global designed a custom network using iDirect X5 VSAT platform to ensure high-efficiency

broadband connectivity. Dual-stabilized satellite antenna systems were provided. The network has the ability to be pooled and shared only by Harkland sites in the same footprint. Secure network connection were established from remote sites to corporate HQ. The network was also capable of beam switching.

ITC Global currently supports the diving support vessel Swordfish, the multi-purpose support vessel Viking Poseidon, and sub-sea vessel Spearfish. These vessels act as a base for advanced remotely operated vehicles (ROVs), and have been placed in the Gulf of Mexico and North Sea to inspect and repair offshore installations. ITC has developed an end-to-end satellite commu-



Harkland's Spearfish multipurpose service vessel.



Custom Network Design for Harkland

nications solution tailored to the unique requirements of Harkland. The network has been designed to ensure operational integrity, protect personnel and property, and provide seamless coverage to sites across the globe.

Results

The result was Improved communications speeds over the previous solution. The network supports additional voice, video and data applications, as well as Citrix, HSE and Financial Procurement corporate applications for Harkland and its clients.

Jim Parker, Vice President Group Marine Assets said "Communications are critical to providing streaming video for our ROVs (remote operated vehicles). ITC Global takes a proactive approach to recommending innovative designs that improve the quality and cost effectiveness of our service. We actually started to take for granted how well ITC Global's services work."

"The personal touch and attention to customer service has been excellent, whether it is business hours, after hours or the weekend. They go above and beyond, and we can even request specific technicians by name," said Jerry Sims, Vessel Manager, Harkland Group.

Interview with ITC Global CEO Joe Spytek

How do you see your position right now in the oil and gas communication segment?

Today we are proud to be one of the top three satellite networking providers to remote industrial markets. ITC Global is a world leader in satellite-base voice, video and data communications for remote industrial operations in over 60 countries and across all the world's oceans. We have service centers and field operations in 40+ countries, over 2GHz of bandwidth across 30+ satellites, and presence in 20+ international teleports, the company has both the global reach and local presence, to meet the customer's needs, no matter how remote the location.

What differentiates you from your competitors?

At ITC Global, we custom design networks rather than impose cookie cutter solutions. We engineer comprehensive solutions for each unique application environment, without bias toward any particular product or technology. This allows us to tailor a solution using the best available technology for our customer. Our clients look for a true partner who will see them as a strategic relationship, not just another contract or point of market share. We focus on the long-term and on what we do best, providing highly-engineered communications backed by excellent service, without bias toward any particular product or technology. This allows us to tailor a solution using the best available technology for our customer.

What trends do you see in the oil and gas space?

The biggest trends we see is a demand for more bandwidth balanced by a need for more cost-effective means of delivery. Offshore operations may want 2, 4 or 10 times the bandwidth they experience today, but they can't necessarily afford up to ten times the price. The network for crew morale angle is no longer a "nice to have." It is critical for the younger generation of employees tasked for working in far locations for weeks on end. From an innovation perspective, we are focusing on new technologies both in orbit and on the ground that improve the bandwidth delivery proposition for the client.

How is your company meeting the changing requirements of your clients?

At ITC Global, we stay on top of newly emerging technologies, but we do not make recommendations until it is field proven. If it works, we deploy it in a way that provides meaningful value to our customers. We have also expanded our capabilities in providing excellent customer service across the globe. We have moved some of our operations closer to the customer base.

What can we expect from ITC Global in the near future? What are your immediate goals and plans?

To improve external communications and provide more real-time data for our clients, the Engineering and Operations teams have been developing a new Customer Portal specifically for our energy clients that will be unmatched in the industry. The portal is in the final stages of developments and will officially be launched Q2/Q3. It will feature a user-friendly dashboard-style interface for use on both table and traditional PCs. The secure portal will enable customers to have near real-time access to their sties on a global map with constantly updated communications link status. The portal will also provide the latest information on any incident tickets, as well as provide a library of standard and customizable performance reports.



"...From an innovation perspective, we are focusing on new technologies both in orbit and on the ground that improve the bandwidth delivery proposition for the client..."

tries. There has been a resurgence of exploration activities in this region due to new technologies such as hydraulic fracking. There is also the large-scale tapping of Shale gas, is natural gas that is found trapped within shale formations. Shale gas has become an increasingly important source of natural gas in North America.

Canada has the third largest proven oil reserves in world after Saudi Arabia and Venezuela. The oil and gas sector is Canada's largest industry accounting for over 18% of its exports in 2012. The Canadian oil and gas industry made an estimated CDN\$ 55 Billion in investments in 2012, according to the Canadian Association of Petroleum Producers. Fueled by rising demand from the US and the emerging markets of India and China, coupled by the instability of the Middle East oil supplies, the growth of the Canadian oil and gas industry is assured in the years to come.

One quarter of Canada's discovered resources of conventional petroleum are in the North and remain undeveloped, as well as about one third of the country's estimated potential. Thus, most oil and gas operations, such as land-based drilling and pipelines, are in the northern area.

Service provider Hunter Communications chose Satmex-7, now called Eutelsat 115, for its Canadian payload due to its orbital location of 114.9° W is in the center of the Canadian arc. This position provides some key advantages, according to Hunter, including:

- It is the only satellite orbital location that can see both the northwest tip of the Yukon and the southeast tip of Newfoundland at a 10 degree elevation or better.
- All other satellites in the US and Canadian domestic arcs, have restrictions placed on them due to adjacent satellites. There are no Canadian beams on either of its two neighboring satellites, so Satmex 7 enjoys fewer regulatory restrictions. For any application involving small antennas (less than 1 meter), this is a critical cost benefit that allows a client to use less MHz to

“...Oil and Gas companies continue to look for the 'next big thing', both in deeper waters and northern climates. As terrestrial solutions continue to penetrate the traditional markets, these 'next big things' will be where satellite-based solutions dominate..”

achieve the same Mbps throughput.

- The Hunter beam in Canada has the strongest power (measured as EIRP) of any beam that exists on competing satellites (see EIRP map in previous page). While the beam covers all 50 US-states, the power is concentrated to the north. This allows for efficient teleport operations through all of North America, but still provides the highest EIRP in Canada, where it is most needed. From the oil-fields of Alberta to the northern passage and Hudson Bay, there is no other Ku-beam with such high power, allowing smaller antennas and lower costs per Mbps.

Conclusion

Among the many new vertical markets emerging for satellite services, the oil and gas market is one of the most promising. The demand for oil and gas shows no signs of diminishing as developing countries become more affluent and demand the same amenities as in the developed countries. This will only lead to increased oil exploration and production activities. Such activities always requires connectivity and communications solutions and satellite will always have an advantage in remote regions and in the oceans of the world. The question is whether satellite service providers continue to innovate and leverage its strengths in order take full advantage of this opportunity.



Virgil Labrador is the Editor-in-Chief of **Satellite Markets and Research** based in Los Angeles, California. He is the author of two books on the satellite industry and has been covering the industry for various publications since 1998. Before that he worked in various capacities in the industry, including a stint as marketing director for the Asia Broadcast Center, a full-service teleport based in Singapore. He can be reached at virgil@satellitemarkets.com



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