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The Global Information Newsletter for the Whole Submarine Cable Industry

EDITORIAL

Eckhard Bruckschen

Welcome to the October issue of SubCableNews.

Another month has passed by and several submarine telecommunications cable projects have been awarded and contracts been signed. SCF, New Caledonia - Australia, Angola Festoon, etc. just to mention a few. Other projects have been discussed in more detail and are close to signature.

In one of our special reports we are presenting the First Mid-East Cabled Seabed Observatory constructed by Lighthouse R & D Enterprises Inc.

Furthermore, Dr. Qian Zhong, Director of System Designs for Tyco Telecommunications is trying to identify a reliable communications network for the offshore industry..

And of course we are presenting another cable ship of the world, the CS "Segero" from KT Submarine.

In this issue you will find the latest project updates and company news from the submarine cable community.

Enjoy reading our Newsletter.

The Editor Eckhard Bruckschen

KT Submarine

Picture: KT Submarine

CS "Segero" in Hawaii

Submit your industry photo
(Installations, cables, office, people etc.)
And be published (free of charge)
With your company logo
On the first page of
SubCableNews

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Biography

Dr. Qian Zhong is Director of System Designs for Tyco Telecommunications and has been working in the telecommunications industry for more than 15 years. He started his carrier at AT&T Bell Laboratories in the optical fiber research area. At Tyco Telecommunications, Dr. Zhong's organization is responsible for the design and provisioning state-of-the-art global telecommunications systems. Dr. Zhong has published more than 20 publications and holds 6 patents. He has been a Keynote speaker for several international conferences and serves on a number of technical committees. Dr. Zhong holds a Ph.D. in engineering and Masters in Business Administration.

The 2005 hurricane season unleashed five unforgiving storms on the Southern United States and Gulf Coast. Hurricanes Katrina and Rita battered the U.S., resulting in unprecedented levels of destruction to offshore oil and gas rig infrastructures. According to the National Ocean Industries Association (NOIA), the impact of the 2005 storms on the Outer Continental Shelf was severe; destroying 113 offshore platforms, seriously damaging 52 more and shutting-in over 95% of offshore Gulf crude oil production, or roughly 27% of total U.S. crude oil production.

The 2006 hurricane season, as predicted by the National Oceanic and Atmospheric Administration (NOAA), is expected to once again wreak havoc in the offshore community with an estimated four to six major hurricanes of Category 3 strength or higher. This poses a challenge the offshore community must face: how can oil and gas providers proactively minimize downtime and speed the recovery efforts of future damage? In efforts to prepare for the unknown, rig operators are looking to identify a reliable communications technology that can protect rigs from the dooming cost of uncertainty.

Identifying a Reliable Communications Network

There are three main options for communications for offshore operations: short range systems, satellite and undersea fibre optic cable. Each of the three provide communications in

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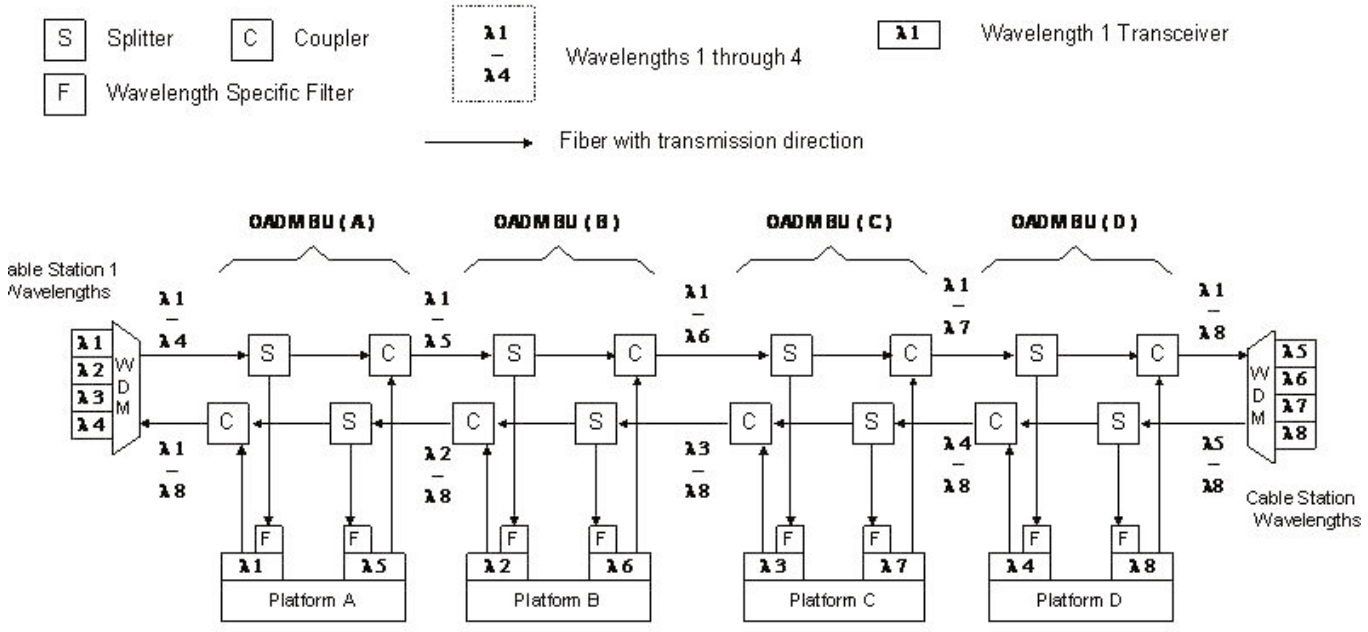

Figure 1 depicts the optical transmission configuration of a typical implementation of Tyco Telecommunications' OADM PSBU, reduced to four platforms for simplicity served by a single fibre pair. Each platform communicates directly with each cable station on a unique, dedicated channel independent from any other platform. A fibre pair configured for eight WDM channels can serve four platforms, each with two paths to shore. The concept is easily extendable to tens of platforms per fibre pair.

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different scenarios, but when reliability is imperative, business decision makers must incorporate current business needs with weather trends to maximize the platform's longevity and productivity. Decision makers should bear in mind critical communications roadblocks and analyse which solutions will optimise the earning potential and viability of their offshore platforms.

Short Range Systems

For rigs close to shore, a wide variety of communications technologies exists to serve their needs, including microwave radio, cellular, WiFi, etc. However, as platforms move farther and farther from shore, line-of-sight microwave becomes less feasible. The opportunity to daisy-chain microwave links to extend reach requires the cooperation of several other platform operators (possibly competitors), and depends on the survival of the entire chain in adverse weather conditions. Microwave, radio and cellular have significant bandwidth limits and are very susceptible to platform movement and weather.

Satellite

Satellite connectivity has the attribute of being ubiquitous, enabling point to multipoint topologies and eliminating last mile issues for companies seeking communications for their rigs.

There are, however, quality and capacity considerations of satellite service for offshore communications to consider. Satellite makes offshore communications susceptible to weather, echo and crosstalk. It has higher latency and materially lower statistical availability/uptime when compared to other options, such as undersea fiber optic cable. Satellites have relatively modest capacity and becomes quite expensive at higher bandwidths when compared to the cost of fiber amortized over its design life. These weaknesses run counter to offshore industry needs of robustness, high reliability and rapidly increasing demand.

Undersea Fiber Optic Cable

For the last 20 years, undersea fiber optic networks have been deployed in the world's oceans and seas to provide secure and reliable telecommunications connections between countries as well as for domestic applications. The high-reliability, low-cost, high-capacity fiber optic technology available in the mature undersea marketplace follows a long tradition of analog and digital transmission cables, according to the Journal of Lightwave Technology. Further, the technical capabilities of these systems, offering a cable capacity in excess of 5 terabits per second via wavelength division multiplexing of 10 Gb/s data streams over multiple fiber can more than meet the bandwidth and security needs of the oil and gas industry well into the future while simultaneously providing the most secure communications network of the three technology options.

Fully integrated Optical Add/Drop Multiplexers (OADM), a state-of-the-art communication infrastructure element provided by industry leaders such as Tyco Telecommunications, fur-

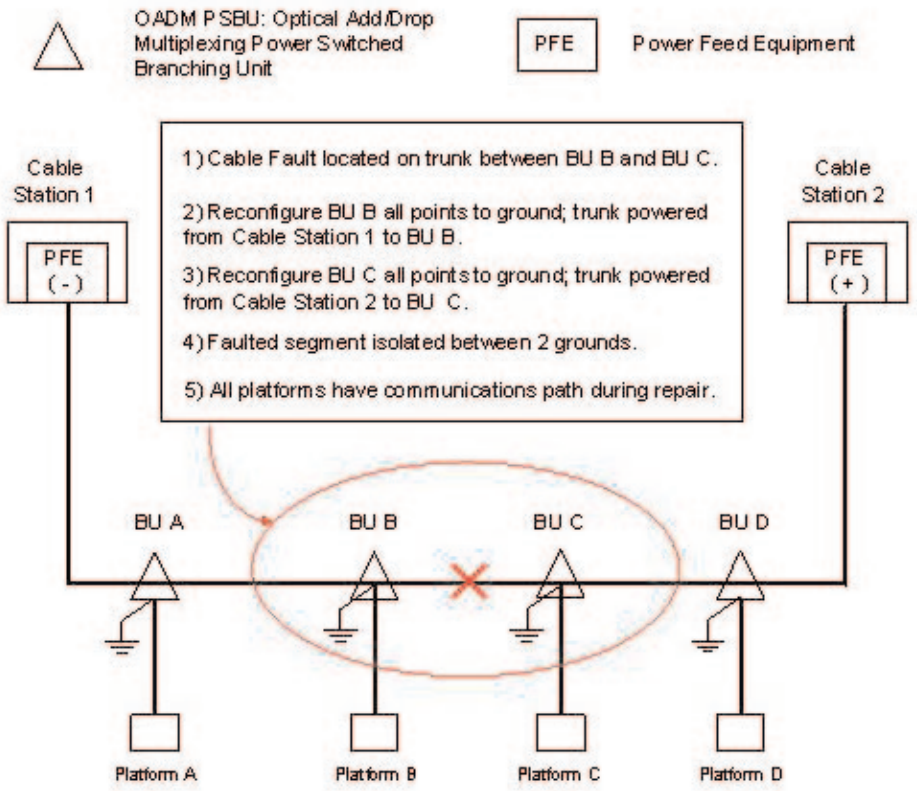

Figure 2 illustrates the powering configuration of the same four-platform network. In the event of a fault in the trunk cable, OADM PSBUs can be reconfigured from the cable stations to electrically isolate the faulted segment during a marine repair. During the trunk repair, all platforms can maintain communications with one cable station.

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ther strengthens a communications network with dedicated bandwidth, enabling constant communications with offshore rigs during turbulent events. OADM technology connects a chain of rigs to the backbone of one undersea fibre optic network. Each platform is provided with a dedicated channel and bandwidth which allows traffic to continue flowing in the event that another rig's connection is interrupted.

OADM

OADM is an add/drop multiplexer system specifically designed to insert and remove optical (10Gbs) wavelength channels from a linear or ring network. Lower level tributaries such as E1 or GigE interface to the 10 Gb/s rail via standard networking equipment such as routers and multi-service SONET/SDH platforms.

Optical Add/Drop Multiplexing Power Switched Branching Units (OADM-PSBU), like those offered by Tyco Telecommunications, are designed for use in systems requiring undersea branching with optical connections. The OADM-PSBU provides optical channel connectivity from each branch leg onto the trunk via its passive OADM optical circuit. The OADM-BU also provides the ability to remotely switch the electrical power path of the undersea cable for fault isolation during repairs.

The OADM PSBU is a broadband system which splits the full optical spectrum of a trunk fibre between the branch cable and the straight-through trunk fibre path. This flexible approach allows a single OADM PSBU design to be used at any location in the system and serves as a universal spare. The advantage of incorporating universal configured BU's into a system presents an attractive solution from OpEx perspective.

The OADM-PSBU power switching feature is controlled remotely and enables system reconfiguration during hurricanes and other external events, maintaining traffic in non-affected segments during marine maintenance operations. The system's internal electrical connectivity is controlled by an optical signal delivered to the branching unit through the same optical fibres used to carry traffic. The electrical switching features support a system design in which the repeatered system's main cable, also referred to as the trunk, can connect to sea ground at any branching point without affecting traffic through the system.

In the event of a system cable fault, such as damage to one connected rig, this feature enables any segment of the trunk to be grounded at both ends during repair operations, while reliably maintaining traffic to all platforms connected to the system. The branching unit can be configured to support fault location techniques, such as electroding, of the branch and trunk cables from an electroding resource at a branch terminal.

What's the cost of loss of communications?

To understand the significance of communications to a platform/well operator, it is important to note that unplanned events cost the oil and gas industry more than $1 billion every year, according to Schlumberger, a leading oilfield services provider. The revenue from a single platform can easily exceed $10 million per day. For example, a single floating platform in water depth of 1,900 meters and with 25 subsea wells is designed to produce 250,000 barrels of crude and 200 million cubic feet of natural gas per day. At current wholesale market prices, this output has a value of over $15 million per day.

The need for reliable communications is further emphasized when examining the impact each threatening storm imposes on an offshore platform. For example, when turbulent weather is predicted, platform evacuation is announced days in advance of the storm's arrival. With the assistance of communications-driven equipment and monitoring systems, the platforms can remain in remote operation throughout, minimizing downtime and facilitating faster recommissioning after the storm passes. The implementation of a reliable communications system supports the return to production in a much shorter period and averts a catastrophic loss of the platform's functionality without compromising the safety of workers.

Conclusion

When considering the importance of their communication systems and determining which communications system to choose, oil and gas companies must consider that proven and innovative high performance communications solutions like undersea cables utilizing OADM, can increase revenue, profitability and oilfield yield, lessen environmental impact, and improve worker safety.