Finance & Legal Edition

In This Issue:

- Snapshot Of U.S. Undersea Cable Regulation
- Improving Critical Infrastructure Cybersecurity
- Legal Innovations In Submarine Cable Projects
- Financing A New Submarine Cable Project
**WEBSITE TRAFFIC - UNIQUE VISITS**

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  - 477,095

- **Issue #8** - Released 11-13
  - 370,754

- **Issue #9** - Released 2-14
  - 221,415
Welcome to Issue 75, our Finance & Legal edition.

The news this week of a missing plane has sent chills down the back of our industry. Those of us who have been traveling a fair amount over the last 25 or 30 years, who have racked up special airline “Million Mile” status awards, understand the game of chance.

Nothing can be made perfect.

We design systems with four “9s” in mind; we identify and qualify and quantify risk down to the smallest detail. We design for trawling and typhoons and anchor drag and shark bite. We’ve even adapted to the post-911 realities.

And then a plane goes missing and we take pause.

So many questions are still unanswered; an imperfect rejoinder is mute.

We remember fondly those members of our special community and our thoughts go out especially to their grief-stricken families and colleagues.
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Alcatel-Lucent And Libya’s LITC To Deploy New 1,000 Km Undersea Cable System Linking Tripoli To Benghazi

APTelecom To Kick-Off 2014 ‘State Of Subsea’ Expert Event Series In Washington, DC, On April 1st

2014 PTC Officers Elected

A Whole New World For The WWW In Africa

Alcatel-Lucent And BT Achieve Fastest Real-World Fiber Speeds Of 1.4Tb/S With A World Record Spectral Efficiency Of 5.7B/S/Hz Over Core Network

Alcatel-Lucent To Upgrade EASSy Submarine Cable System Along Africa Arctic Fibre Data Gathering Meeting

Australia Japan Cable Deploys Infinera Intelligent Transport Network Bharti Infratel Stock Zooms On Deal With Reliance Jio

Billion-Ringgit Undersea Cable Project

Brazil, Europe Plan Undersea Cable To Skirt U.S. Spying

Cable Repair To Temporarily Slow Down International Internet Connections

Chunghwa Telecom To Add Overseas Business Offices

Chunghwa To Build 3 Int’l Submarine Cables

Could Tata Be Facebook’s Next M&A Target?

Date Announced for SubOptic 2016

Ericsson And Ciena Announce Strategic Global Agreement

Etihad Etisalat Company : Mobily Signs an Agreement to Build an International Submarine Cable Linking Asia to Europe

EU Mulling Investment In South America-Europe Undersea Cable

Fatal Flaw In Plan To Evade NSA

Fugro Introduces ‘Cable Analyst II’ Route Design And Data Management Package

Fugro Glo Confident of Securing Broadband Licence

Global Marine To Rely On Nexans Green Issues

Hawaiiki Cable Signs Up Solarix
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Huawei Marine Successfully Completes Viatel (Flores-Corvo) Submarine Cable System In 10 Months

Huawei, ZTE Employees Among Passengers on Missing Plane

ICPC Appoints New General Manager

IFC Invests In Seaborn Networks

India’s Reliance Globalcom No Longer For Sale, CEO Says

Kenya Telecoms Market: Arrival Of Fibre-Optic Submarine Cables Revolutionizing Industry

New Developments in O&M

New Submarine Cable Costs Less

NTT Has Launched A Collaborative Study With Alcatel-Lucent Japan And Fujitsu To Develop Server Architecture For Future Networks

Ocean Networks Selects Xtera For The Turnkey Supply Of The South America Pacific Link Submarine Cable System

Pacnet Enhances Wave Premium Service

Pacnet Upgrades Trans-Pacific Submarine Cable with Ciena

Pacnet’s EBITDA Improves But Upgrade Depends on Data Centre Success

Palau Telecoms Selects Xtera For The Turnkey Supply Of The Submarine Cable System Linking Palau to Guam

PCCW Global In All-Stars Consortium To Construct New Asia Africa Europe-1 Cable System

Plan To Sell Submarine Bandwidth

PLDT Links Western Visayas To Palawan Through Submarine Cable

PTCL Inks Agreement To Build Submarine Cable System

Reef Subsea Announce Ownership Changes

Santec Introduces A New Programmable Optical Filter For Flexible Network And Its Test System

Seaborn Networks Mandates Natixis As Sole Structuring Bank, Underwriter, And Lead Arranger On Brazil-US Subsea Cable Project

SEACOM Boosting Services To Meet Demand

[click a title to read the full article]
- Second Submarine Cable By 2016
- Southern Cross To Add Another Terabit Using Ciena 100G
- STF Today Streaming SubOptic Submarine Cable Workshop @ PTC 2014
- Submarine Cable Almanac Issue 9 Is Available Now
- Submarine Cable Workshop Part 2
- Submarine Cable Workshop PTC ‘14
- Tata Selects Ciena GeoMesh To Enable 100G Across Submarine Cable
- Telebras Moves Away From Africa For Undersea Cables Project, Making Europe Its “Priority”
- Telecom Egypt Reaches $12.5M Settlement For Submarine Cable Damage
- Telefonica Del Sur To Focus On FTTH Deployment This Year
- Telekom Malaysia Teams Up with Etisalat SmartHub to Support Its Growing Regional Business
- Telstra Believes Its Subsea Cables Can’t Be Tapped
- Telstra Partners With Infinera In Upgrading Multiple Submarine Routes In Asia Pacific
- Telstra, Optus, AJC Back Subsea Cable Bill
- The Naked Truth: Session 1
- TI Sparkle To Convert Sicily Into Leading Cable Landing Hub
- TM Forms Consortium To Build 20,000km Undersea Cable
- TM, 14 Other Telcos In Undersea Cable Project
- Tyco Names Stephen Wasdick Vice President Of Global Communications
- Unifi Secures Bin Project Permit Renewal From The Republic Of Albania
- Welcome Back My Friends
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- Capacity demand, capacity supply, and capacity pricing
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- Thoughtful insight
- Global perspective
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One Year

2014

2013
Welcome to SubTel Forum’s annual Finance and Legal issue. Every March we aim to take a snapshot of the industry’s current finance and legal status by presenting our most current data as tracked by the ever-evolving SubTel Forum database, where products like the Almanac and Cable Map find their roots. It has been one year since our last look at the financial situation of planned systems around the industry. Planned systems have been announced, announced systems have been implemented, deals have been made, and compromises are found; as we all know, a lot can happen in one year.

Since our last Finance and Legal issue, we observed that of the planned systems announced to be ready for service in 2013, 83% were actually accomplished, the remaining systems were pushed into 2014 for various scheduling or financial reasons. Not all planned systems are destined to become the successor to sliced bread; in the last year, roughly 24% of the systems that we discussed have fallen below standards to be considered a viable planned system. However, not all is lost, while those systems fell by the wayside, 15 new contenders have been announced to be ready for service between 2014 and 2017.
Continuing the theme of comparison, of systems announced to be ready for service over the next 4 years, the ratio of consortium owners to single owners has shifted from last year’s estimate of roughly 46% consortium to 54% single owner, to a new estimate of 50% each. The 4% swing isn’t an earth shattering figure, but it does show a departure from the single owner paradigm, in favor of a larger ownership base with less risk per owner. Seeing the estimates, and with all things being equal, one can easily make the assumption that consortium systems will track more reliably from year to year as self-financed systems, whereas single owner systems with outside financing will be more subject to market pressures and insecurities.

With the dominating number of single owners systems announced for 2015, the ratio of Debt/Equity Financed systems to Self-Financed systems has shifted from last year’s estimate of 37% D/E Finance to 63% Self-Finance, to the current estimate of 43% D/E Finance to 57% Self-Finance. In a one year, the Debt/Equity Financing model has grown 6 points, keeping in track with the influx of new single owner systems announced for 2015.

Over the last year, there has been little change in the actual break down of
regions that are expecting growth over the next four years. The south Atlantic is still ripe with planned system linking the BRICS nations, the Indian Ocean has been added to a few routes, but the elephant in the room is still the Pacific, seeing more than 20 planned systems expected to land in various locations.

With more than 40 some systems planned to be ready for service between 2014 and 2017, it’s hard to not be excited for the submarine cable industry; however, to see past the flashy marketing and barrage of positive press releases, one has only to look at the only true measure of a planned system’s viability: has the system gone Contract in Force? Of the numerous hopeful systems planned over the next couple of years, even just the systems planned for 2014, only 7% has actually gone CIF, a figure that casts a rather dark shadow on the future of many of these planned systems. Financing has been, and remains, difficult in the submarine cable industry, new systems have to present iron clad business cases and financiers must scrutinize those plans, separating out the genuine from the dreamers.

For more information on the regions mentioned in this article, please be sure to check out the SubTel Forum Quarterly Submarine Cable Almanac.

-SubTel Forum Research Team
Snapshot
Of U.S. Undersea Cable Regulation — 2014

Kent Bressie
U.S. regulation of undersea cables typically fills operators with dread. Over the years, regulatory burdens have grown significantly, with scant benefits to the industry. In 2013, however, the industry made notable progress on the issues of fees and cable protection. This article brings readers up to date about Team Telecom security reviews, the impact of disclosures about surveillance by the U.S. National Security Agency (“NSA”), potential changes in universal service contributions and annual regulatory fees proposed by the Federal Communications Commission (“FCC”), and cable protection initiatives undertaken by an FCC advisory committee.

1. Team Telecom Delays and Compliance Burdens Continue

For undersea cable systems, the “Team Telecom” agencies—the U.S. Departments of Defense, Homeland Security, and Justice—continue to conduct security reviews of, and impose mitigation measures on, systems with foreign landings and/or systems with foreign ownership. (Prior to 2008, Team Telecom focused only on foreign-owned systems.) As a matter of practice, the FCC refers to Team Telecom any application disclosing direct or indirect foreign ownership of 10 percent or more. Team Telecom typically petitions the FCC to defer licensing until Team Telecom completes its security review and negotiates mitigation with the applicant. U.S.-owned cable landing license applicants for domestic or military systems are not subject to Team Telecom reviews and are eligible for streamlined grants within 45 days of application acceptance. Table 1 shows license processing times for recent systems.

Team Telecom scrutinizes both applications for new systems, as noted above, and also applications for transfers of control and assignments resulting from mergers, acquisitions, and corporate reorganizations. Transfers and assignments that would result in control by a foreign person are also subject to review by the Committee on Foreign Investment in the United States pursuant to Section 721 of the Defense Production Act of 1950, as amended. Unlike the FCC, which defines “control” as majority equity ownership, voting control, or management control, the CFIUS may consider as “control” any prospective investment other than the acquisition of an outstanding voting interest of

<table>
<thead>
<tr>
<th>System</th>
<th>Date FCC Application Filed</th>
<th>Date of Security Agreement or LOA</th>
<th>Date FCC License Granted</th>
<th>Total Licensing Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerald Express</td>
<td>Feb. 5, 2014 pending</td>
<td>pending</td>
<td>pending</td>
<td>pending</td>
</tr>
<tr>
<td>AT&amp;T GOKI</td>
<td>Mar. 29, 2011 none*</td>
<td>Apr. 14, 2011</td>
<td>16 days</td>
<td></td>
</tr>
<tr>
<td>UUI TERRA-SW</td>
<td>Sept. 14, 2010 none</td>
<td>Oct. 28, 2010</td>
<td>44 days</td>
<td></td>
</tr>
<tr>
<td>HANTRU1</td>
<td>Feb. 25, 2009 none*</td>
<td>June 10, 2009</td>
<td>105 days</td>
<td></td>
</tr>
<tr>
<td>CB-1</td>
<td>June 3, 2008 Feb. 11, 2009</td>
<td>Feb. 13, 2009</td>
<td>250 days</td>
<td></td>
</tr>
<tr>
<td>Unity</td>
<td>May 16, 2008 Sept. 21, 2009</td>
<td>Oct. 5, 2009</td>
<td>508 days</td>
<td></td>
</tr>
<tr>
<td>PPC 1</td>
<td>Feb. 11, 2008 Sept. 4, 2008</td>
<td>Sept. 10, 2008</td>
<td>212 days</td>
<td></td>
</tr>
<tr>
<td>GCI SEAFAST</td>
<td>Oct. 23, 2007 none</td>
<td>Dec. 6, 2008</td>
<td>44 days</td>
<td></td>
</tr>
</tbody>
</table>
10 percent or less acquired solely for the purpose of passive investment. Consequently, even a minority foreign investment can trigger a CFIUS review. Table 2 shows approval times for recent undersea cable-related transactions.

Team Telecom reviews applications for new FCC licenses and for FCC transaction consents, whether for telecommunications infrastructure or for services. Consequently, it reviews applications for U.S. carrier licenses, known as international Section 214 authorizations. In 2013, it took a foreign-owned applicant an average of 290 days to obtain an international Section 214 authorization. By contrast, U.S.-owned 214 applicants are not subject to Team Telecom reviews and are eligible for streamlined grants within 15 days of application acceptance. Table 3 shows application processing times for select international Section 214 applications.

Team Telecom also continues to scrutinize equipment procurement across all sectors of the communications industry, including undersea cables. In the 2013 review of SoftBank’s acquisition of U.S. carriers Sprint and Clearwire—including Sprint’s undersea cable assets—the mitigation agreement with the U.S. Government included a commitment that the U.S. carriers remove certain Chinese-origin equipment in their networks.

Disclosures by former NSA contractor Edward Snowden regarding NSA surveillance inside and outside the United States using U.S. telecommunications infrastructure and (forced) participation by infrastructure owners, carriers, and cloud providers have led some infrastructure owners and carriers to wonder about the use of information gathered during Team Telecom reviews. The disclosures have also generated concern about new delays in the Team Telecom review process.

2. Disclosures About NSA Surveillance Create Fallout for Undersea Cable Operators

The challenges to undersea cable operators and their customers posed by the disclosures about NSA surveillance are not limited to effects in the Team Telecom process. Although the substance of the disclosures is mostly old news—much of the information first came to light in 2006—the disclosures have impaired customer assurance efforts of providers regarding data protection. They have threatened competitiveness of U.S. providers—particularly Internet and cloud businesses and carriers that earn most of their revenues outside the United States. They have led governments and politicians to demand that existing and new undersea cable operators cease or limit participation in such efforts, or creation of bypass routes (the utility of which remains highly questionable). And they have increased

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Date FCC Application Filed</th>
<th>Date of Security Agreement or LOA</th>
<th>Date FCC Consent Granted</th>
<th>Total Approval Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Caribbean Fibre/Digicel</td>
<td>Dec. 19, 2013</td>
<td>pending</td>
<td>pending</td>
<td>pending</td>
</tr>
<tr>
<td>Wavecom/HT</td>
<td>July 17, 2012</td>
<td>none</td>
<td>Dec. 28, 2012</td>
<td>164 days</td>
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</table>
concerns that the U.S. Government may shift data storage obligations, costs, and legal risks to industry.

The legality (under U.S. law) of these surveillance activities remains hotly debated and could be the subject of new legislation limiting such activities, although the timing and likelihood of such legislation remain highly uncertain. It also remains to be seen whether foreign governments might engage in similar surveillance activities—to the extent they do not already do so.

3. FCC Universal Service Contribution Reform Has Stalled

In 2012, the FCC proposed to reform contribution rules for the federal Universal Service Fund by eliminating the “international only” and “limited interstate revenues” exemptions on which many undersea cable operators rely. (For background, see Kent Bressie, Is It Time to Consider Landing in Canada? Proposed Changes to the FCC’s Universal Service Contribution Rules Threaten Undersea Cable Operators, SubTel Forum Issue 64, August 2012.) Undersea cable operators would pay a percentage-of-revenues assessment (currently, 16.4 percent of end-user revenues) on all revenues from sales of capacity touching the United States, regardless of whether the sales are actually made in the United States. Due to changes in FCC leadership, continuing disagreements about related reform proposals, and undersea cable industry efforts to fight the proposal, it appears to have stalled but has not been withdrawn.

4. FCC Regulatory Fee Reform Continues

In 2013, and following vigorous opposition by the North American Submarine Cable Association and other interested parties, the FCC abandoned its proposal to increase undersea cable operator fees by 230 percent. (For background, see Kent Bressie, U.S. Regulatory Update: FCC Proposes Extraordinary Increases in Annual Regulatory Fees Paid by International Undersea Cable Operators, SubTel Forum Issue 64, August 2012.) In its 2013 report and order on regulatory fees, the FCC adopted fees that were essentially static as compared with 2012, with a per-system fee of US $217,675 for a system with capacity greater than or equal to 20 Gbps.

Having pressed the FCC to reform its undersea cable-related fees and avoid associated economic distortions since 2003, the industry is clearly suffering from regulatory fatigue. Nevertheless,
the industry must remain vigilant to prevent the adoption of uninformed and costly proposals. In 2014, the FCC will initiate a further regulatory-fee reform proceeding. The FCC is sympathetic to changes that could significantly reduce annual regulatory fees.

5. CSRIC and Cable Protection

The FCC’s Communications Security, Reliability, and Interoperability Council ("CSRIC")—a committee chartered under the Federal Advisory Committee Act—has formed an undersea cable working group to promote resilience of U.S. undersea cable infrastructure, particularly in light of conflicts with:

- Offshore energy development projects, including offshore wind, wave, and tidal energy and oil and gas projects, and
- Sand dredging and beach replenishment activities.

The working group includes undersea cable industry representatives, capacity customers, and other government regulators and is chaired by the author of this article. By March 2015, the working group will produce three reports identifying industry best practices for separation distances for marine infrastructure and mesh networking, policies and interagency coordination mechanisms for cable protection and coordination of infrastructure permitting, and factors contributing to the clustering of cables and cable landings.

Kent Bressie is a partner and head of international practice at the law firm of Wiltshire & Grannis LLP in Washington, D.C. An expert on telecommunications regulation and international trade and investment, he represents international network owners, service providers, equipment suppliers, and investors in a broad range of legal and regulatory matters, including: national security and investment reviews; telecoms licensing; environmental permitting; export controls and sanctions; WTO/market access; corporate and commercial transactions; and the law of the sea. He works extensively in the undersea cable sector and has led various industry-wide regulatory-reform and cable-protection initiatives.
Improving Critical Infrastructure Cybersecurity

Ross Buntrock
On February 26, 2014, the United States Department of Justice (DOJ) petitioned the Foreign Intelligence Surveillance Court to allow the National Security Agency (NSA) to maintain its database of telephone records that would otherwise need to be purged pursuant to its existing data-collection authority authorized by the court. DOJ requested this additional authority ostensibly to ensure that the DOJ has access to records that may be relevant to lawsuits targeting the NSA’s sweeping collection of telephone metadata of both Americans and other countries’ citizens alike. One plaintiff challenging the NSA’s collection of telephone metadata, the American Civil Liberties Union (ACLU), stated that the DOJ’s request “is just a distraction. We don’t have any objection to the government deleting these records. While they’re at it, they should delete the whole database.”

These revelations and others by former NSA contractor Edward Snowden will likely add more fuel to fire for foreign governments to protect their citizens’ data from U.S. government eavesdropping. Most commentators agree that these revelations have spurred Brazilian President Dilma Rousseff to press the European Union to accelerate the pace of the deployment of the planned $185 million undersea fiber optic telecommunications link that will be laid directly from the northeast of Brazil to Fortaleza, Portugal. It remains to be seen, however, whether the four anticipated submarine cable systems that were planned to be added between the United States and Brazil in the coming years will be put on hold until there is a thaw between the countries’ leadership.

Similarly, German Chancellor Angela Merkel and French President François Hollande have been engaged in discussion recently to explore methods to protect EU citizens’ data and keep email traffic away from U.S. servers. Chancellor Merkel stated she “will talk with France about how we can maintain a high level of data protection. Above all, we will discuss which European providers we have who offer security to citizens so that you don’t have to cross the Atlantic with emails and other things, but also can build up communication networks within Europe.”

Some cybersecurity experts, however, question how secure foreign citizens’ data can be even if it is not processed through U.S. based servers, given the disclosure last year that the NSA was tapping into Pacnet’s submarine cables located across the Asia-Pacific region. Tapping submarine cables, however, is certainly not a recent phenomenon. Beginning in the early 1970s, the U.S. government began tapping Soviet naval undersea communications links deployed between Soviet naval bases. This project lasted until 1981 when NSA employee Ronald Pelton, now serving a life sentence, disclosed the existence of this eavesdropping operation to the Soviets for the sum of $35,000.

More recently, the Associated Press reported in 2005 that the USS Jimmy Carter, a Seawolf-class attack submarine, was repurposed for highly-classified...
missions, including the ability to carry crews of technicians to the bottom of the sea so that they could tap into undersea fiber optic lines. Additionally, the NSA paid its British equivalent, the Government Communications Head Quarters (GCHQ), $25 million to radically upgrade its listening station operated at Bude in the north of Cornwall, where many undersea cables surface out of the Atlantic.

Perhaps to quell some of the ongoing furor surrounding U.S. surveillance, the Obama Administration announced in mid-February the launch of its voluntary Cybersecurity Framework, which is the result of a year-long effort led by the National Institute of Standards and Technology (NIST) and key industry participants to develop a voluntary how-to guide for organizations in the critical infrastructure community to enhance their cybersecurity. In a potential nod to the controversy surrounding the NSA data-collection controversy, the Cybersecurity Framework also offers guidance regarding privacy and civil liberties considerations that may result from cybersecurity activities. Although many organizations already have processes for addressing privacy concerns, the Cybersecurity Framework methodology is designed to complement such processes and provide guidance to facilitate privacy risk management consistent with an organization’s approach to cybersecurity risk management.

The Cybersecurity Framework is a key deliverable from President Obama’s Executive Order 13636, entitled “Improving Critical Infrastructure Cybersecurity” and which President Obama announced in his 2013 State of the Union speech and released on February 12, 2013. The Cybersecurity Framework is intended to steer companies toward best practices that deter hackers and other cyber spies from interfering with critical infrastructure, including global digital infrastructure, such as undersea communications cables that surface on U.S. shores.

The goal of the Cybersecurity Framework is for industry and government to
strengthen the security and resiliency of critical infrastructure based on public-private cooperation. Yet given that the United States Senate has twice failed to advance White House-backed legislation to give government more explicit authority to mandate certain minimum standards for cybersecurity of private sector critical infrastructure, the Cybersecurity Framework remains entirely voluntarily and lacks many key incentives sought by industry stakeholders. Many businesses have argued that perks – such as giving participating companies immunity from lawsuits in the event of a hacking incident, tax breaks, special technical assistance, or other incentives – are necessary to offset the costs of investing in new security technologies and procedures.

Further, despite being applicable to only US-based companies and government agencies that provide critical infrastructure, the Cybersecurity Framework references globally accepted standards, guidelines and practices, so that organizations domiciled inside and outside of the United States can use Cybersecurity Framework to efficiently operate globally and manage new and evolving risks. In refusing to develop US-centric standards, NIST stated that diverse or “specialized requirements can impede interoperability, result in duplication, harm cybersecurity, and hinder innovation.” For organizations with more advanced cybersecurity, the Cybersecurity Framework also offers a way to better communicate with their CEOs and with suppliers about management of cyber risks.

Each of the Cybersecurity Framework components is intended to reinforce the connection between business drivers and cybersecurity activities. The Cybersecurity Framework is divided into the following parts:

- The Cybersecurity Framework Core is a set of cybersecurity activities, outcomes and informative references that are common across critical infrastructure sectors, providing
detailed guidance for a company to develop its cybersecurity risk profile. The cybersecurity activities are grouped by five functions -- Identify, Protect, Detect, Respond, Recover -- that provide a high-level view of an organization’s management of cyber risks.

• The Cybersecurity Framework Profiles are intended to help organizations align their cybersecurity activities with business requirements, risk tolerances, and resources. Companies can use the Profiles to understand their current cybersecurity state, support prioritization, and to measure progress towards a target state.

• The Cybersecurity Framework Tiers provide a mechanism for organizations to view their approach and processes for managing cyber risk. The Tiers range from Partial (Tier 1) to Adaptive (Tier 4) and describe an increasing degree of rigor in risk management practices, the extent to which cybersecurity risk management is informed by business needs, and its integration into an organization’s overall risk management practices.

NIST, however, is quick to acknowledge that the Cybersecurity Framework is not a one-size-fits-all approach to managing cybersecurity risk for critical infrastructure. As NIST stated, “organizations will continue to have unique risks – different threats, different vulnerabilities, different risk tolerances – and how they implement the practices in the Framework will vary.” Organizations are thus encouraged to determine their specific activities that are important to critical infrastructure delivery and to prioritize investments to maximize the impact of their continuing cybersecurity efforts.

Although the adoption of the Cybersecurity Framework is entirely voluntary, the Department of Homeland Security (DHS) has established the Critical Infrastructure Cyber Community (C³) Voluntary Program as a public-private partnership to increase awareness and use of the Cybersecurity Framework. The C³ Program is intended to connect companies, as well as federal, state, local, tribal, and territorial partners, to DHS and other federal government programs and resources that will assist their efforts in managing their cybersecurity risks.

The goal of C³ is to provide a forum for participants to share lessons learned, get assistance, and learn about free tools and resources that can help them.
The industry is at a transformational time in the submarine cable space, and there is a need to come together and exchange ideas and insights and work together toward cultivating a culture of innovation and collaboration across the entire sector. The goal of APTelecom’s ‘State of Subsea’ DGM event series is to establish a forum for all industry players, and to improve the communication within the submarine cable industry for new models and ideas as a younger generation moves into the space.
Legal Innovations
In Submarine Cable Projects

Mike Conradi
Recent years have seen a renewed levels of investment into the submarine cable sector, especially in emerging markets such as Africa and the Asia-Pacific region. Some of these have brought with them some interesting legal and structural innovations. In this article I will aim to discuss, briefly, the innovations that I am aware of, or have been involved in myself. I will end with some legal points concerning the sales of IRUs.

**Sale and Leaseback**

During 2013, the Brazilian investment bank and asset manager BTG Pactual purchased the Globenet submarine cable network (with its 22,500km of cable infrastructure) from Brazilian telecoms operator Oi. The acquisition was valued in the region of US$ 750m, making it one of the largest ever submarine cable acquisition anywhere in the world.

One of the most interesting innovations that the project included was the central “take or pay” arrangement that involved the supply of capacity by GlobeNet back to Oi and its subsidiaries through a fixed-price long-term contract with volume guarantees. This model is effectively a sale-and-leaseback arrangement taken from project finance deals, and usually used in, for example, large energy projects (or telecoms towers deals). DLA Piper’s role was in advising BTG Pactual on this arrangement, and in order to make it work we had to think through a number of completely new issues - such as what guarantees and service levels it would be reasonable for the target company, GlobeNet, to offer to its former parents in respect of the services which are to be provided. We needed to discuss and agree an appropriate mechanism to ensure that GlobeNet was not offering a higher standard of service than it used to provide to its parent prior to sale, when there were no arms-length contracts in place, and we needed to agree on mechanisms to deal with cable cuts, pricing changes and demand spikes over an extended period of time.

**Insolvency of a Landing Party**

Also in 2013, we were involved in a matter for a telecoms operator client that wanted to buy capacity from the landing party of a consortium cable system in an emerging market. The deal was to be structured as an IRU (ie with a significant
up-front payment) but the customer, our client, was concerned about losing their rights, and their money, in the event of the future insolvency of the seller. The most obvious solution would have been to change the payment terms so as to convert the IRU into a lease but for various reasons this was not feasible.

The issue of the possible insolvency of a landing party has not often been a major concern for submarine cable consortia. This is likely to be because, up until recently, most of the cables connected developed countries and most of the landing parties were, as a result, national incumbent operators with a significant financial asset base and so a low likelihood of insolvency. In this case though, it was a legitimate and real concern. If the landing party became insolvent the purchaser of IRU capacity could be left as an unsecured creditor without either its capacity or a refund of its money.

The innovation which we came up with in discussions with our client was to petition the next quarterly meeting of the consortium in order to ask them what sort of protection they might be able to offer. We ended up with a solution whereby the consortium agreed to consider a rule saying that in the event that any of their members is thrown out of the consortium because of insolvency, the consortium would consider, in assessing the suitability of any replacement landing party in the country concerned, whether or not that prospective new party would agree to honour the IRU commitments made by its predecessor to third parties (such as our customer-client). This agreement, together with the good relationship built-up between all the parties as a result of the discussions, meant that although it did not assure the customer that their IRU would be honoured no matter what in a legally binding way, they nevertheless had enough confidence to proceed with the deal.

**Sale of Spectrum (and “virtual spectrum”) not capacity**

Another recent development in the industry has been the sale not of capacity (for example 40 Gb/s) but of spectrum. The concept is that customers buy the rights to use a particular and allocated range of radiocommunications frequencies and then they can use that
piece of spectrum in whichever way they choose by equipping it with equipment to turn that spectrum into capacity. They might, for example, choose to use the same spectrum cheaply by equipping it for a few wavelengths each of, say, 10 Gb/s or they might instead choose to pay more for the latest generation of 100 Gb/s wavelengths (or, in the future, more). It would be up to the customer to choose when to upgrade without reference to the seller of the cable system or to the other users of the infrastructure, so long as they operate only on “their” spectrum and only.

Since this model was first suggest it seems to have rapidly spread as a concept. Because it is so novel, though, there are as yet no commonly-accepted standards for how the contracts should be structured. At its simplest level, a spectrum sale is just a services contract much like a lease (or IRU - see below) of capacity. This means that the customer is simply given a contractual right to use a certain piece of spectrum. Additional complexity may be introduced though because of the fact that some sections of spectrum on any given fibre-pair will be more useful than others. On one contract which I have been involved with recently the customer’s spectrum is “virtual” - they are allocated an amount of spectrum equivalent to a given percentage of the total spectrum on a single fibre-pair, but this could be sub-divided into smaller sections of spectrum across several different fibre-pairs on the same cable.

This then introduces additional concepts - if, for example, there is a problem with one of the fibre-pairs in the cable but not the other, does the customer lose part of their spectrum or does the supplier have an obligation to switch them to the fibre-pair which is still functional?

Private cables becoming consortia

Following on from the previous point, it is not possible to easily split up spectrum into as many different pieces as capacity can be divided into - and so the sellers of spectrum will typically only have a few customers on each fibre-pair in a cable. Each customer, then, is typically being asked for a large amount of money in advance - especially if the sale is by IRU and the contract is a pre-sale for an as-yet-unbuilt system. In these circumstances customers might be concerned about losing their rights in the event of the insolvency of the seller.
As an aside, I would just add that there is, in my experience, still a large amount of misunderstanding of the nature of an IRU in the submarine cable business. This is a topic I have written about and spoken about before but in brief it is my view that an “IRU” does not convey a property right—it is simply a services contract. This means that if the seller becomes insolvent then the holders of IRUs are unsecured creditors. There is no meaningful way in which they can be said to own anything physical.

This concern has prompted another innovation in the submarine cable sector. On one deal we were advising-on recently, the seller was a special purpose vehicle (SPV) set up specifically to build a new system. The business model was to sell spectrum, not capacity, to customers by way of pre-sale and to ask them for upfront payments as IRUs. In order to deal with the above-mentioned insolvency concern the deal has been structured with quite a new model. Although the SPV will contract with a Vendor to build the system and will then be the owner of the assets to be constructed initially, each customer buying spectrum will obtain not just a contractual right to “its” spectrum but will also receive a undivided percentage interest in all of the system. At the same time as buying “their” spectrum they will also sign up to a pre-written and pre-agreed consortium agreement which governs how the assets will be jointly managed and dealt-with.

The idea is to have the best of both worlds—the flexibility that comes with a private cable system in terms of being able to make quick decisions and avoid committees, especially in the early stages when it comes to negotiating with the Vendors and making other arrangements, but also the ability to offer customers real ownership of assets in a meaningful and legally effective way.

Restrictions on resale in a submarine cable capacity (or spectrum) pre-sale agreement.

In a pre-sale contract for a new submarine cable system whose construction would impact markets in the European Union, the seller (ie the company wishing the build the new system) often wants to place a restriction on the buyer, which is typically taking a large amount of capacity (or, these days, spectrum) preventing it from reselling all or part of the capacity to other customers, and instead requiring the buyer to use it only for their own internal business purposes.

The issue here is that restrictions of this type risk falling foul of EU competition (anti-trust) laws because they may be said to distort the market. However, the buyer may argue that without this type of restriction in the pre-sale contract it would not be possible, or would be much harder, to make a business case for building the new infrastructure, and that the new cable will ultimately increase competition and so reduce prices in the relevant markets.

If so, then so long as the restriction is drafted narrowly and is limited in time to the minimum necessary to achieve this pro-competitive objective then our view is that the restriction may, in appropriate cases, be justifiable and so lawful.

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Financing
A New Submarine Cable Project

Andrew D. Lipman, Ulises R. Pin & Andrew M. Ray
The construction of a new submarine cable network generally requires many millions of dollars. Declining margins, increasing operating expenses and stricter financial scrutiny following the “Great Recession” made securing financing for cable projects more difficult for much of the past decade. But there are significant signs of light. After years of stagnation, a combination of increasing worldwide demand for Internet connectivity and bandwidth, the substantial increase in video content, as well as the shift of content away from the U.S. to servers in Asia and Europe is starting to revive the submarine cable industry.

In the next few years, several billion dollars will be spent on submarine cable projects. How does a sponsor secure some of these dollars for a private submarine cable project? This paper describes the steps to successfully secure the necessary financing from various funding sources.

**Step 1: Identify a market opportunity.** An appropriate business plan for a new submarine cable network is largely what separates a funded project from one that is simply a good idea. Yesterday’s “connect the world” and/or “if we build it they will come” approaches will falter. Instead, financeable business plans will focus on targeted opportunities in underserved regions or areas where additional capacity is required to cope with expected demand for broadband and IP-enabled communications. Funding sources are likely to favor systems targeting South Asia, Africa and Latin America.

**Step 2: Prepare a realistic business plan.** Investors generally want to see detailed, phased budgets that take into account all costs, including finance charges during the construction and operation periods, as well as ample contingencies for cost over-runs and delays. To do this well, sponsors must: (a) identify all potential customers by casting a very wide net; (b) be realistic on assumptions and valuation including traffic demand, existing bandwidth availability, other planned infrastructure such as proposed competing cable systems and being very mindful of constantly declining cost of bandwidth; (c) identify sources of debt financing, including vendor financing, which may be coming back; (d) address regulatory and environmental issues early (e.g., permitting); (e) maximize tax efficiencies; and (f) assemble a
top-notch management team. Even
with a complete and thoughtful plan, sponsors should expect potential
investors, including lenders to assess
proposals using a significant discount
on projected revenues.

**Step 3: Secure the appropriate technology vendor.** Without a firm
commitment from a technology vendor, sponsors cannot be sure of project
costs. Additionally, sponsors and their backers should explore obtaining part
of the financing from the network supplier or equipment vendors.

**Step 4: Identify, secure, and structure funding sources.** Identifying,
securing, and structuring financing for a system is critical to the business plan.
The finance jigsaw puzzle may be completed all at once, but it generally
needs to be done in parts, and requires patience. Securing pre-sales or even
“soft” commitments from customers is commonly a precondition to funding.

**Financial source 1: Equity Investors.** No business venture can function without
equity. Potential equity sources for cable systems include private equity ("PE")
finds, venture capitalists ("VCs") and other institutional investors.

Although VC and PE certainly differ, they share an interest in certain matters.
They will both tend to favor projects that: (1) reasonably expect high returns
(including free cash flow); (2) have a “fully funded” network (i.e., having
significant number of pre-sales); (3) provide them a preference over other
equity providers and sponsors; (4) have anti-dilution protections; (5) include
sophisticated corporate governance provisions; and (6) articulate a clear
exit strategy. To ensure that exit strategy, they may have so called “put” or redemption rights after some
period of time, typically between five
(5) and seven (7) years after the initial investment.

PE funds are extremely selective, and
tend to fund later stage companies. PE
may be an option for: (1) developers
building subsequent systems; (2)
funding network updates; (3) funding
systems that otherwise have significant
customer commitments with
predictable cash flows; or (4) as an exit
strategy for venture funded systems.
Thus, VC is the most obvious choice to
provide the bulk of equity commitments
for early stage developers.
Despite a greater tolerance for risk, VC funds are also extremely selective with respect to the opportunities they pursue. On average, only one in every 400 business plans initially reviewed by these funds will receive funding. For taking greater risk, venture capital funds expect greater reward. Venture funds generally expect financial projections to ensure greater than 30% returns on equity capital. Sponsors may be required to contribute hard assets, such as contracts, licenses or permits in addition to “sweat equity” and increasingly significant money of their own.

The exit strategy will also be an important issue to equity investors. VCs generally expect profitability in 3-5 y. After achieving that goal, they will want to know how they can monetize their investment. Since an Initial Public Offering may not be available, alternative strategies must be considered such as: (1) identifying potential strategic buyers and merger candidates; (2) combining with other regional networks; and (3) securing new private equity or institutional investors that prefer mature systems. As noted above, “put” or redemption rights will provide leverage for equity investors to ensure an exit.

Financial source 2: Commercial Lenders. Debt will usually fund a majority (sometimes up to 2/3) of the total building costs, with equity funding the rest. Commercial banks are slowly recovering, interest rates are still relatively low and financial institutions appear to be increasingly willing to fund private submarine cable developers. But lenders are likely to scrutinize business plans more closely and conditions on loans will probably be more stringent. Lenders will favor deals that provide effective sponsor accountability and that consist of reputable operators and sponsors with good performance histories.
Many private submarine systems were financed using a pure “project finance” structure (i.e., senior secured, non-recourse or limited recourse debt payable solely from the cash flows of the project). Despite having a reputation for increased transactional costs, this structure is likely to remain common because the structure is well-suited for mitigating the contingencies that often arise in new submarine cable projects. However, the larger and more complex the project, the more likely developers will need a diverse portfolio of debt, including technology vendors, a commercial bank syndicate, local bank financing, and/or additional commitments (i.e., loans) by equity sponsors.

The business plan will likely require short-term financing as well, including revolving facilities and letters of credit. Securing funding from multiple parties requires implementing intercreditor provisions which are often heavily negotiated. For example, debt in different facilities may want to coordinate “required lender” provisions, share collateral, and generally be on equal footing.

In addition to basic loan terms, debt documents will contain significant restrictive covenants. Most important to every banker are the financial covenants, including cash reserves and debt coverage and debt-to-equity ratios. “Lock box” structures and cash sweeps are very common. To ensure the project is well insulated with cash reserves to protect against foreseeable and unforeseeable contingencies, debt financiers may limit dividends and other distributions during the term of the credit facility. Free cash flow should be sufficient to guarantee return on equity and ensure payment of principal and interest and funding reserves. Lenders will probably expect a diverse and full set of collateral, including stock, contracts, and hard assets.

Financial source 3: Multilateral Organizations. An alternative, and in recent years more prevalent additional source to commercial finance may be the availability of funding from multilateral organizations. Depending on the location of a project, sponsors should
look to regional organizations (e.g., Asia Development Bank, Inter-American Development Bank, Overseas Private Investment Corporation (“OPIC”), International Finance Corporation (“IFC”), etc.). Developers may also look for local or domestic development banks, infrastructure funds, sovereign wealth funds, broadband development plans or other “stimulus” sources from national or local organizations, which are referred to herein as multilateral organizations.

Though uncommon, multilateral organizations may also act as equity sponsors. For example, the IFC, a member of the World Bank Group, has an equity program targeting telecommunications companies and has in the past invested equity in submarine cable operators. In recent years OPIC has also taken equity positions in submarine cable developers.

Multilateral organizations also: (1) act as secondary debt arrangers/providers (typically through “B Loans” where the development agency acts as administrative agent and syndicates loans to other commercial banks), (2) act as guarantors (generally partial guaranties of bonds or loans), (3) insure political and currency risk and (4) provide technical cooperation and grants for feasibility studies. But they generally provide better terms than commercial banks. Additionally, multilateral organizations commonly lend and/or insure projects in emerging markets, and having a multilateral organization on the capital structure may facilitate local permitting. Where legal and regulatory structures are underdeveloped, this can help reduce the greater legal and regulatory risk stemming from long government consent and license approval periods.

There are pros and cons to using multilateral organizations. Funds from multilateral organizations usually come with more rigid conditions including restrictive provisions not typically found in commercial lending transactions (e.g., covenants related to child labor, collective bargaining, higher environmental standards, etc.).
Other Considerations. Negotiating and structuring financing documentation can be a very delicate balancing act. Sponsors need to propose reasonable debt and equity levels and approach short and long term debt sources and equity providers with adequate rewards for the risks involved. Multiple pieces of the jigsaw puzzle must come together at the same time. Patience is crucial. All of these financing sources will be long term “partners” to the sponsors.

In addition to the business plan, sponsors should expect to address and be flexible on corporate governance issues with financial sources. Moreover, all sponsors should be ready to deal with cross-border risks stemming from currency devaluation and convertibility, unpredictable political environments, expropriation, and local law. Insuring against these risks may be costly in some locations. In many emerging market transactions, political risk insurance may be a requirement. Additionally, consideration must be given to environmental and regulatory risks. Crucial to lenders is the timely securing of landing licenses and easements. As the number of jurisdictions that the cable project touches increases, so too will the complexity of the issues. The legal requirements for perfecting collateral will vary from one locale to another. As such, a nationally diverse set of lawyers will be required, increasing overall cost.

In sum, despite some improving economic conditions, the environment remains less than ideal. There is no single solution to finance new networks but multilateral organizations are increasingly taking a more significant role in the development of new regional systems. Success will depend on precise identification of a market opportunity based on local and regional needs for capacity and a business plan that is both focused and realistic.

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Ulises Pin represents U.S. and foreign communications and technology companies on a broad range of corporate, financial and regulatory matters. He also advises private equity firms, venture capital funds and financial institutions in connection with investments in the TMT and technology sectors. Ulises represents clients before the Federal Communications Commission as well as government agencies in Mexico, Latin America, Europe and Asia. His practice includes all sectors of the TMT market, including wireline, wireless and international communications, VoIP, infrastructure projects (land and submarine networks), satellite services and emerging technologies.

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Analyzing The Need For More Trans-Atlantic Capacity

Eric R. Handa
If you attended my speech at PTC in Hawaii this past January, you heard me discuss five key issues that I believe will determine a new Atlantic cable (private or consortia):

First, 2014 is a key year, many systems have been discussed over the past 3 plus years, but price points keep falling (roughly US5K a month or lower for a linear 10G from NY-LON route). Also, equity financing remains challenging for many submarine cable builds globally, and the Atlantic is no exception.

Second, 2015 RFS, many carriers need to start seeing traction with a private cable or look at TAT-15 type of options. Forward planning is super important when running a mesh network in particular across the Atlantic given its critical importance to serve markets beyond such as Africa and the Middle East. Many new systems (such as APTelecom client – Angola Cables) are pioneering new routes via the South Atlantic where no systems exist, and offer diversity and resiliency for European, North and South American, and African networks. This is exciting and innovative, interest remains high to load balance on the South Atlantic route verse North Atlantic route.

Third, 2016 decommissions of existing systems is a possibility on older systems such as TAT-14, Yellow, AC-1, etc…this would help support a new system for nothing else but some supply being taken out of the market and a lower cost basis to run or partake in a new system as an owner of an IRU would likely occur and result.

Fourth, Return on Equity (ROI) cable or not on Atlantic (North), the economics remain challenging. The reality is the hangover from 2000 and the glut and overbuilding that occurred has weighed heavy on many that lost out in trying to finance these assets. In addition, APTelecom believes demand remains strong at current price points across the Atlantic yet will buyers pay more for a new system or simply sweat
existing assets for as long as they can. No clear cut answer here but that’s the question along many that operators area asking themselves.

**Fifth and finally, the allocation of capital and a stand-alone wholesale only business model** seems not to be discussed, and I think it’s important to ask the question: Can a pure wholesaler survive on the Atlantic in 2014 with a true cost structure, not one that was picked up for cents on the dollar? Managed services, security, a balanced product set would help to fill the network and certainly provide a more balanced revenue stream than selling simply pipes that see little price “stickiness.”

It will be an interesting year to see who gets funded and who doesn’t, and what sort of price points we see as we close the first quarter of 2014 across the Atlantic. At some point, upgrading can only continue for so long and new infrastructure will need to be deployed in order to manage meshed networks between NY-LON, yet the economics must make sense or we risk a 2000 repeat and that hurts the entire global submarine industry.

Stay tuned and watch this route in the coming quarters ahead.

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**Which route will get built first?**

- Australia-Singapore (42%)
- South Atlantic (38%)
- North Atlantic (13%)
- Southeast Asia (Indonesia-Guam) (5%)
- Other (2%)

The surprising result in this particular survey was the Southeast Asia – US result. With the population of Southeast Asia continuing to grow, coupled with relatively low Internet penetration rates, one would expect this region to be in focus. Perhaps the respondents believe that the region is currently well served by existing cables.

![Graph from The APTelecom bi-Annual Market Report](image-url)

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**Eric Handa** is an experienced telecommunications executive with expertise spanning global management, sales, and leadership roles. With over 15 years of ICT experience gained at some of the worlds leading telecom companies, he brings practical and structured guidance to APTelecom, integrating best-in-class technology with the tactical and strategic needs of enterprise and wholesale firms. Passionate about telecommunications leadership, Eric consistently drives innovation and customer focus within organizations.
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The Telegraph Construction and Maintenance Company Ltd

The 7th April will mark the one hundred and fiftieth anniversary of the company that was the dominant submarine system supplier of the ‘Telegraph Era’, the Telegraph Construction and Maintenance Company Ltd. (Telcon).

After the failure in 1857 and 1858 to lay a successful telegraph across the Atlantic, a joint committee was set up, between the British Government and the Atlantic Telegraph Company, in 1859, to investigate the failures. It met twenty-two times and its report was finally published in 1861. It was this report that renewed enthusiasm in the Atlantic cable and led to the establishment of Telcon.

Telcon was formed on 7th April 1864 by the amalgamation of two existing companies. The first of these was the Gutta Percha Company, which had been formed on 4th February 1845 by Charles Handcock (1800-77) and Henry Bewley (1804-76), who agreed to share their individual patents and make a wide range of products out of the newly discovered gutta percha. It is generally accepted that Dr William Montgomerie (1795-1856), Assistant Surgeon to the Presidency of Singapore was the man who introduced gutta percha into Western Europe. He first encountered gutta percha (latex from the Palaquium gatta tree) in Malaya in 1842, and shortly afterwards sent samples back to the Society of Arts in London, setting out its properties and possible uses. Early in 1845, Michael Faraday (1791-1867), having seen Montgomerie’s samples, is said to have remarked to his friend, Carl Wilhem Siemens (1823-83), that such a substance, being impervious to damp, might prove very useful as an insulator of electrical current. Siemens obtained a sample from the Secretary of the Society of Arts and sent it to his elder brother, Ernst Werner Siemens (1816-92), with a recommendation that it should be tried on German underground telegraph cable, the insulation of which had proved troublesome. That same year, Henry Bewley developed a machine to extrude gutta percha tubing and, in 1846, the company opened its factory at 18 Wharf, Islington, in London. In 1848, Charles Handcock modified Bewley’s tubing machine in order to coat copper wires in gutta percha. Although he had developed this machine in the company’s time, for some unknown reason he was allowed to patent it in his own name. This patent became the basis for all future submarine cable insulation processes. Bewley and Handcock fell out over this patent in a big way; Handcock was dismissed and set up the West Ham Gutta Percha Company in opposition. The price war that ensued resulted in the collapse of the West Ham Gutta Percha Company and led to Handcock founding of the India Rubber and Gutta Percha Company in Silvertown, on the north bank of the Thames in 1864.

Gutta percha had been used for several years to insulate underground telegraph wires, before the Gutta Percha Company received its first order for cable insulated by...
gutta percha to be used as an experimental submarine cable, in 1848. The experiments were conducted, in 1849, by Charles Vincent Walker (1812-82) on behalf of the South Eastern Railway. Two nautical miles (nm) of copper core insulated by gutta percha was manufactured and Walker laid this from the Princess Clementine in Folkestone harbour. On 10th January 1849, telegraphic messages were exchanged between London and the ship. The next submarine cable projects for the Gutta Percha Company was the 1850 channel cable, followed quickly by the 1851 cable to France, the 1852 cable to Ireland, 1853 cable to Belgium, the Bretts' abortive Mediterranean cables and, of course, the 1857 and 1858 Atlantic cables. By 1864, the Gutta Percha Company was the monopoly supplier of insulated core to the submarine cable industry.

The second company was Glass, Elliot & Company. The history of this company begins on 8th March 1841 with the granting of a patent for "Untwisted Iron Rope" to Johann Baptiste Wilhelm Heimann, a merchant based in Ludgate Hill, London. The patent related to improvements in the manufacture of wire ropes and cables. In 1842, Heimann and Johann George Wilhelm Küper formed a partnership to manufacture wire rope in London. They set up their factory on the Grand Surrey Canal at Camberwell. In 1848 the business went bankrupt; one of the company’s major customers, the mining engineer George Elliot (1814-93), was appointed as the company’s agent and over the next two years reduced the outstanding debt. The company was re-registered as W. Küper and Company and found significant new markets for its cables in mines and as standing rigging on ships, including several major contracts with the British Royal Navy. Offices were opened at 115 Leadenhall Street in London, the Camberwell site was expanded and a new production facility was opened at Mordern wharf in East Greenwich. In late 1850, when Wilkins and Whetherly began production of the 1851 English Channel cable, they were sued for patent infringement by R S Newall (see Back Reflection Issue 55). R.S. Newall took over the project and manufactured the majority of the cable on the Wilkins and Whetherly site but a small amount of cable was subcontracted to Küper and Co. In 1851, Elliott became sole proprietor, having paid of the creditors and bought out the original company directors.

Richard Attwood Glass (1820-75) was a trained accountant and played a significant role in the recovery of Küper and Co. In 1852, he suggested to Elliott that there could be a significant business opportunity in protecting submarine cable with iron wire armouring. Küper and Co secured a number of such contracts including a Sweden to Denmark cable and the initial abortive Mediterranean cables for the Brett Brothers (see Back Reflection 73). In 1854, Elliott took Glass into partnership and Glass, Elliot and Co was formed absorbing the Küper’s business. In that year, the Gutta Percha Company supplied Küper and Co with 700nm of insulated core. The market grew rapidly and soon Glass, Elliott and Co needed to enlarge their manufacturing capability. To do so, they made an agreement to share the purchase of the Enderby’s Hemp Rope Works, with...
a rival submarine cable manufacturer, William Thomas Henley (1814-82).

This Thames side site, which was next door to the Morden Wharf facility, had been crown land since 1694 when it was purchased to build a gunpowder store. Due to ongoing public protest about the risk of explosion, the store was finally shut down and the land sold to Henry Vansittart (1732-70), in 1769. It then became a bleach works and in 1800 was leased for the production of “vitriol” (sulphuric acid). The area was also associated with the manufacture of hemp rope from the end of the eighteenth century. In 1819, the whole site was purchased by the whaling company of Samuel Enderby & Sons. They added a sail works and Hemp factory to the already existing “Rope Walk”. The Enderbys were always prepared to lease parts of the site to other industries and, from 1837, were involved with William Fothergill Cooke (1806-79), joint owner of the first telegraph patent, in the development of an insulated telegraph cable to be laid across the Thames. On 8th March 1845, a devastating fire at Enderby Wharf put an end to the family’s involvement in the emergent telegraph business.

Contemporary reports in the Kentish Mercury and the Illustrated London News give a description of the factory at this time: it consisted of two large waterside buildings used to manufacture canvas and spin hemp, a flax mill and a ‘pitch house’, together with a steam engine, boiler, stables, houses for the foremen, a smithy, a joinery shop and the family residence itself, Enderby House. The house was thought to have been built in the early 1840s as it was not on an 1840 site map but was one of the few buildings to survive the fire. Enderby House was repaired after the fire, but it appears the rest of the site was not redeveloped and fell into disuse.

The site purchase by Glass, Elliott and Henley, included Enderby House, which became the management offices and board room, was completed in 1857. However, the joint arrangement did not go well and after only a few months, Henley moved his manufacturing facilities to the other side of the Thames at North Woolwich. Glass, Elliott and Company made 1,250nm of the 1857 Atlantic cable and manufactured the additional 900nm for the 1858 cable. From 1861 onwards, Glass, Elliott and Co and W.T. Henley competed aggressively for the available submarine cable projects, but it was Richard Glass that recognised that the only way to address such a massive undertaking as an Atlantic cable was through a single company controlling every element of the supply.

This idea led to the formation of Telcon. How this occurred is best described by John Pender (1816-96), its first Chairman. The following is an extract from a letter written by Pender to Thomas Egerton, 2nd Earl Wilton (1799-1882) on 10th October 1866 from his Scottish estate Minard Castle in Argyllshire:

“It was not until May 1864 that a further attempt was made to obtain capital upon an eight percent Preference Stock; & I myself raised amongst my own personal friends subscriptions to the amount of £20,000.

Negotiations were opened with the Firm of Glass Elliot & Co cable manufacturers but after a time it was found the public who had been appealed to did not make any sufficient response and that firm as a private company did not feel justified in taking the number of
Shares required to complete the work. At this time Glass Elliot & Co first broached the idea of purchasing the Gutta Percha Co’s works and Patents and having obtained the option of purchase for a fixed sum they applied to one of the principle Financial Companies under the Limited Liability Act. These negotiations however proved fruitless.

It was at this discouraging crisis that Mr Cyrus Field, whose ardour in the cause and success of the Atlantic Cable has been most unreserved, consulted me as to the best course to be pursued with a view to another attempt he knowing that I felt most deeply interested in the success of an undertaking in which we had both been engaged so many years. I told him that in my opinion with a little energy a Company might be formed embracing Glass Elliot & Co & the Gutta Percha Co which combined Company would I believe be able to carry out this great work. Further I stated to Mr Field I would undertake the formation of such a Company. I knew that the Gutta Percha Co were willing to sell their business & plant to Glass Elliot & Co for £250,000 provided they were guaranteed for that amount.

I took upon myself this heavy responsibility & this I may say was the turning point of the whole enterprise.

The new Company was accordingly formed (mainly by my exertions) called “The Telegraph Construction & Maintenance Company” uniting the business of the Gutta Percha Co with that of Glass Elliot & Co & it was through this new Co that the enterprise was brought to a successful issue.

I went amongst my friends and business connections & in the course of a few days obtained subscriptions for considerably more than half a million in money. Prospectuses were prepared and brought before the public under the following very influential direction.

[Prospectus details]

While not a major player in the formation of Telcon, Daniel Gooch (1816-89) played a major role in the success of the Atlantic Cable and the future of Telcon. Gooch had made his fortune under Isambard Kingdom Brunel (1806-59) with the Great Western Railway. In 1864, he resigned from Great Western and joined the board of Telcon. At that time he was a director and shareholder in the company that owned the SS Great Eastern. She had failed spectacularly as a passenger ship, the company was winding up and the ship was put up for auction in Liverpool. Gooch bought the Great Eastern for £25,000, set up a new company with the bondholders and chartered her to Telcon for £50,000 worth of cable shares. And the rest, as they say, is history.

The Atlantic cable was successfully completed in 1866 and largely due to the
patronage of John Pender, who stood down as Telcon chairman in 1868 in favour of Daniel Gooch and set about building his empire that became the The Eastern and Associate Telegraph Companies, Telcon went from strength to strength.

Under Daniel Gooch, Telcon came to dominate the submarine telegraph cable supply industry, with the SS Great Eastern providing sterling service until 1874 when she was decommissioned soon after laying her 5th Trans-Atlantic cable. Telcon’s dominance continued until the early 1920’s when the competition from radio depressed the submarine cable market. Because of its size and the support of Eastern, Telcon was able to see off almost all its UK competition. R S Newall left the industry in 1870; W T Henley in 1900; Hooper’s Telegraph and India Rubber Works Ltd in 1910 and the India Rubber and Gutta Percha and Telegraph Works Co went in 1922. By 1935, only Telcon and Siemens Brothers (established in 1863) survived and they merged to form Submarine Cables Limited (SCL). SCL was the sole manufacture of submarine cable in the UK, at Enderby Wharf, until Standard Telephones & Cables (STC) opened a cable factory in Southampton in 1956. SCL was taken over by STC in 1970 and

established STC Submarine Systems Ltd with its headquarters based on the Enderby Wharf site in Greenwich. In 1975, the production of submarine cable on the Greenwich site ceased, after 131 years, and cable manufacture was centred on Southampton. STC was the leading supplier of submarine cable systems during the ‘Telephone Era’ and a major supplier of optical systems until it was purchased from Northern Telecom, in 1994, by Alcatel to form Alcatel Submarine Networks (ASN). In 1996, Alcatel closed the Southampton cable factory in favour of its Calais Factory (see Back Reflection Issue 47), thus bringing to an end 146 years of submarine cable manufacture in the UK. ASN became part of Alcatel-Lucent in 2006. In the last year or so, the ASN site, on the Thames at Greenwich, has shrunk with the sale of the water front real estate, bringing to an end the industry’s 160 year association with Enderby House.

As a Grade II listed building Enderby House is the only existing build on the site that will survive the re-development. Whether its role as in the focal point of the leading submarine cable manufacture of the ‘Telegraph Era’ will be preserved for posterity in this new development is, as yet, unclear.
Telecoms consulting of submarine cable systems for regional and trans-oceanic applications
Conferences

ICPC Planery Meeting
18-20 March 2014
Dubai, UAE
Website

State of Subsea
1 April 2014
Washington, D.C., USA
Website

PTC 2015
18-21 January 2015
Honolulu, Hawaii USA
Website

January:
Global Outlook

March:
Finance & Legal

May:
Subsea Capacity

July:
Regional Systems

September:
Offshore Energy

November:
System Upgrades
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I've been building a fence.

As you may or may not know, I live on a farm in the Virginia Piedmont. We raise hogs, cows, sheep, turkeys, geese and chickens. After taking a break over the winter, we've been preparing for the coming growing season while contending with the bi-polar Virginia weather patterns.

We built a new hen house for a batch of layers that are coming next week. We're planning on keeping 80 layers, enough to keep our customers in stock with plenty leftover for ourselves. I make the best eggnog you've ever tasted, but that's a story for another day.

We put up the fence over the weekend, and it was quite a job. I hand dug 14 post holes and cut up a bunch of cedar logs to serve as the posts. Cedar is pretty amazing stuff, better than locust in my opinion because you can actually drive a staple into it. And cedar grows nice and straight.

The thing about a fence, you want it to be strong and you want it to get the job done. It's kind of like building a submarine cable system.

Think about it: The folks that are out there on the cable ships, the people that install the repeaters and set up the data centers and design the cable routes... the entire world depends on the work that these people do everyday. They build the systems strong and they get the job done.

Now, I can tell you from experience that there is no fence built by humans that can hold in a hog indefinitely. They are God's bulldozers, smarter than some people that I've met, and constantly trying to figure out how to escape. Just the same, there is no submarine cable that is indestructable. But if you build the system strong and bury it properly, you offer up the best chance of keeping it online.

So here's a toast to the people that build the systems and keep the world connected. You don't get near enough credit as far as I'm concerned.

Until next issue...