

INSURANCE AND RISKS IN THE SUBMARINE CABLE WORLD

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Abstract: This paper looks at the potential development of insurance products allowing carriers and operators to mitigate losses from external events impacting their system or network. Looking beyond traditional loss of business cover or established marine perils it aims to promote discussion about how insurance products could allow for more flexible and cost effective repair strategies that could be alternatives or adjuncts to traditional models. Cables are the foundation of the global internet bringing greater media awareness of interruptions. Additionally the ' cloud ' concept is spreading requiring greater network stability in an intensely competitive and low margin business.

Perspectives: For carriers and owners insurance provides opportunities to evaluate alternatives using insurance products to manage risk rather than commit directly to upfront standby costs designed to provide fast response times. For smaller operators and carriers the additional costs incurred from a serious outage can have a direct bottom line impact. Even if standby charges budgeted for, actual repair or mitigation costs can impact P&L as well as loss of revenue. Larger operators may have greater resilience but with investments on a global scale any savings on traditional methods is multiplied. Marine Services providers are under constant pressure to reduce costs while simultaneously deploying more complex and costly vessels. Multiple or complex cable repairs require additional resources at short notice and high cost to meet their SLA obligations, could insurance cover mitigate this?

Risk and coverage: An insurance provider must have data about the perils they are expected to cover and hitherto incidence of faults and limited number of subsea systems has been barely adequate, but numerous new systems and more transparency may mean for the first time actuarial evaluations can be made to cover subsea cable perils.

1 INTRODUCTION

In less than two decades fibre optic digital technology has totally re-shaped global communications, revolutionising the way we do business, how we interact and organise our daily lives.

Over this short period the speed and impact of change has been dramatic with Internet and mobile phone traffic increasing from around 75 million worldwide users in the mid 90's to in excess of 8 billion today.

The introduction of photonics and more recently DWDM technology now allows

the Internet of today to support a wide variety of multimedia services far from the origins of simple email and data browsing. The Cloud concept brings affordable mega utility, shortly 3DTV and perhaps in the next few years graphene modulated communications 'extremeband' will take the internet into another dimension with petabit and exabit transmission speeds. Evolving applications will undoubtedly push global loading and boundaries to new levels of increasing diversity and seemingly unlimited capacity.

On the global level submarine fibre optic cable has been the driving force behind

this sea change. By design it is the ideal medium for transporting voice and data traffic, and in all key respects has for some years had an overwhelming advantage over Satellite transmission but with one disadvantage; physical vulnerability. The very demanding and unpredictable environment of submarine cables brings a unique set of challenges, the most profound test of which is cable break.

With increasing stakes, and where physically submarine fibre optic cables now have such far reaching geographical influence, and a measurable effect on GDP for many remote island state economies, the physical vulnerability and measures to protect continue to be a major concern. As are high ongoing maintenance, repair and future high costs of expanding the subsea physical infrastructure. If consumer demand continues at the present rate could capacity limits for high density routes like the Atlantic be threatened, to the point that seamless re-routing cannot cope. The prohibitive cost of new cable and build out combining to make bandwidth rates untenable. What if this congestion coupled with a meaningful cable break, what costs would that entail and how would they be covered?

There is a high incidence of submarine cable breaks around the world each year, mostly single and smaller scale but when repair ship costs can run around £10,000 a day, average repairs around £500,000 and modern repeaters at £1,000,000 a piece for some operators this can be more than an unwelcome expense. Although it is recognised O&M cooperatives may bring more control, reduce outgoings and larger breaks are more remote, these costs including vessel standby of anything up to £10 million a year must still be paid for. Until the physical architecture of submarine fibre optic cable systems resembles more the complex and protected networks of its terrestrial counterpart, submarine networks will by nature remain

higher risk and continue to attract higher operating costs.

Repairs in more accessible waters or better serviced areas with greater redundancy are of less concern where anchor drag and similar external forces prevail, but this can escalate without warning to expensive multiple simultaneous breaks, more usually at congested 'choke points'. The combination of deep water, remoter location and Natural causation from earthquake, earthquake triggered tsunamis, and sediment shift are certainly less common but can take cable break to a new level of extreme delay and costs. Cables can run at depths nearing 6 miles and most cable ROV's operate to a working limit of 4 necessitates the use of more highly specialised vessels and technical crews. These situations may prove particularly sensitive for smaller independent economies which rely on long thin feeder cable routes, and where operators pay high maintenance and communication costs to service these areas. Upgraded cable capacity may be available but in the absence of adequate physical redundancy the costs of such breaks can be very telling.

Increasing natural catastrophe a threat to costs?

Insurance industry data clearly shows a trend pointing to more frequent higher risk events worldwide.

Munich Re reported in 2010 global economic loss for natural catastrophes amounted to some US\$ 150bn, with earthquakes alone accounting for almost one-third of this total. Altogether, the insurance industry had to shoulder losses in the order of US\$ 37bn for this period. This "far exceeded" the number of disasters in recent years. This was quickly topped in 2011 with a massive \$400 billion record and Typhoon Morakot in 2009, multiple cuts in the Mediterranean in 2008 and Taiwan Hengchun earthquake of 2006 contribute to show over time the

propensity for increased escalation and severity, but this also serves to highlight the huge multi billion gap between uninsured and insured losses. 2012 reached a much reduced \$160 billion and insured losses \$65 billion which mirrors records for submarine cable breaks as there were no 'major disasters' reported that year.

The 2011 Japan earthquake and tsunami disaster involved a fault rupture of 10 to 30 but Japan sustained international communications throughout. This may well be attributed to routing undersea cables in separate trenches and bringing them ashore at different cable landing stations.

Nonetheless enhanced diversity and redundancy is no guarantee to containment; Hengchun at 6.7 was far more devastating. Similarly windstorms do create the lion's share of catastrophic natural losses each year but incidents like typhoon Morakot show windstorm can also be a major contributor for cable break. Certainly the frequency and severity of Mother Nature is at best unpredictable but it begs the question why insurance does not play more of a central role in offsetting financial risk. It could prove a very useful ally in assisting operators to better manage costs associated with cable breaks for both high and lower frequency incidents and at a proportionately affordable level. Insured losses reaching \$119 billion, Japanese and New Zealand earthquakes accounting for almost two-thirds.

In this changing environment can insurance offer new concepts?

2 REPAIR AND MAINTENANCE

Advancing and complex technology promotes more discussion in the boardroom about the risks companies are carrying. Global natural catastrophe losses demonstrate there is a very large gap between insured and uninsured risks which must represent missed opportunities both for insurers and businesses. The insurance industry has always been very adept at

responding creatively to varying and changing needs, but now it is recognised these skills and expertise must also be more 'outwardly deployed' to assist clients manage and innovate their business. A more holistic approach can be important to understanding cost issues rather than specifics, and promoting 'risk solvers' rather than just product design, in effect a more rounded and 'solutions based' approach is now more common to determine needs and remedy.

Whilst interest rates remain low as do investment yields and GDP, the UK insurance market finds itself largely in a position of surplus capacity producing downward pressure on rates with little short term prospects of a harder market. Catastrophic losses the likes of hurricane Sandy in 2012 have had little impact on this soft cycle, and although the natural reflex is to adhere to more stringent underwriting in this environment, there is also a very healthy thirst to explore new opportunities in different and progressive fields of activity.

Submarine cable maintenance and repair remain the most costly operational items for service providers but represent the corner stone in the support of SLA agreements for cable operators and telecom service providers. At a time when general incremental costs associated with submarine cables such as capacity upgrades have become so much cheaper, there appears to be no indication O&M costs are moving the same way. Other than common interest in the submarine cable itself, the vessel operator has very different operating and expenditure criteria. This appears to leave consortium based agreements a mainstay in controlling costs.

The development of submarine cable ring systems initially promised reduced immediacy of vessel standby, and this will increase with new technologies such as Mesh Networking and rerouting at the IP level allowing operators to get a proper grip increasing capacity and resilience.

If such processes can safely protect customer traffic then SLA requirements are likely to be re-thought and may attract more flexibility in pricing between maintenance providers. Long term maintenance agreements might also have a tendency to convert to spot. These moves speculate potential savings, but ultimately this does not avoid repair bills.

Conversely insurance can however provide a definite and reliable means to saving costs on call out and repair charges.

Transferring risk to insurers provides a cost efficient means to gain control over repairs and vessel call out charges, and in doing so this becomes a 'managed exposure'; the responsibility shifting to insurers at a premium representing only a small percentage of the potential insured loss.

By doing so this also frees up working capital from the balance sheet, can relieve tight operating margins, optimise P&L and potentially shareholder confidence. In particularly tight financial markets evidence of insurance can also assist secure capital, or provide confidence to lenders if cash flow is seen to be protected from unpredictable costs such as repair. In effect with the right risk management insurance can provide the means to making capital work harder, at the same time adding the underlying security of the insurer.

Insurance cover for repairs could be tailored for individual operators or collective regional agreements, and in each case be geared to respond to particular financial constraints or limits and taking into account cable dynamics, historical data, location and depth.

Perhaps more ideally this insurance could be included within O&M contracts as an integral part of the maintenance offering, either ad hoc or back to back with multi-year maintenance agreements. With access to statistical knowledge gathered by maintenance contractors or service

providers this would allow insurers a reliable and valuable platform to cost out policies to the benefit of the insured. Such an insurance agreement may also assist ease relations and negotiations between parties and add further security to Service Level Agreements, and have some impact on maintenance costing. Cover might include;

- vessel call out/hire costs, steaming time, bunkers, crewing and ancillary expenses agreed by contract
- optical fibre jointing, repeaters and associated submarine cable parts
- maintenance contractors; optional extension for loss of equipment on board repair vessel specific to insured break

Conditions responding to 'all risks' of cable break from external physical aggression howsoever caused, subject to any specific exclusion, or limited to named insured perils. A suitable level of self insurance is likely to apply but depending on the nature of cover afforded; aggregated losses over a period of time or single catastrophic. Pricing levels depending on the method might also be controlled by limiting the number of insured days of indemnity per year, and per incident based on pre-approved steaming and hire costs or a simpler flat limit applied.

3 BUSINESS INTERRUPTION AND RELATED LIABILITIES

Business interruption extensions for smaller submarine cable operators to cover lost trading from downtime might also be feasible mirroring sales contracts as a measure for an agreed indemnity, but in excess of contractual self insured retentions. Agreement might also be reached to accept deferred or accumulative repairs to suit re-routing capabilities or the insured's financial limitations.

For larger global operators and carriers submarine cables are likely to represent only a small part of overall investment, and here understandably mature network

diversity may be preferred to combat breaks, underpinned by O&M contractors and carefully drawn up contracts. Although such submarine cable operational costs are less significant for such companies, any savings made are magnified on a global scale. Therefore capping aggregated repair losses or securing sleep easy insurance cover for a singular catastrophic event could add value even on this scale.

Other contenders in the submarine cable world have very different objectives where submarine cables play a more central and vital role, here the effects of cable break are a fundamental concern. Smaller coastal or island based operators are likely to be more dependent on international revenues as are businesses founded on one or two cables to service specific markets. Have historically nurtured extensive international trade or seek to form new island hub routes. Developers promoting niche systems into existing markets, new venture companies involved in submarine cable build and lay-out process or those bringing capacity to countries previously dependent on satellite services. All these enterprises have more direct exposure to potentially large costs for repair and varying financial obligations and operating margins. Business continuity planning can of course manage risk down to a certain level but sudden and unexpected losses, such as cable break can have a critical impact for many smaller ventures and this is where the right insurance strategy can prove to be a life line.

4 A MORE EFFICIENT FINANCIAL CONSTRUCT FOR A MORE ROBUST NETWORK ENVIRONMENT?

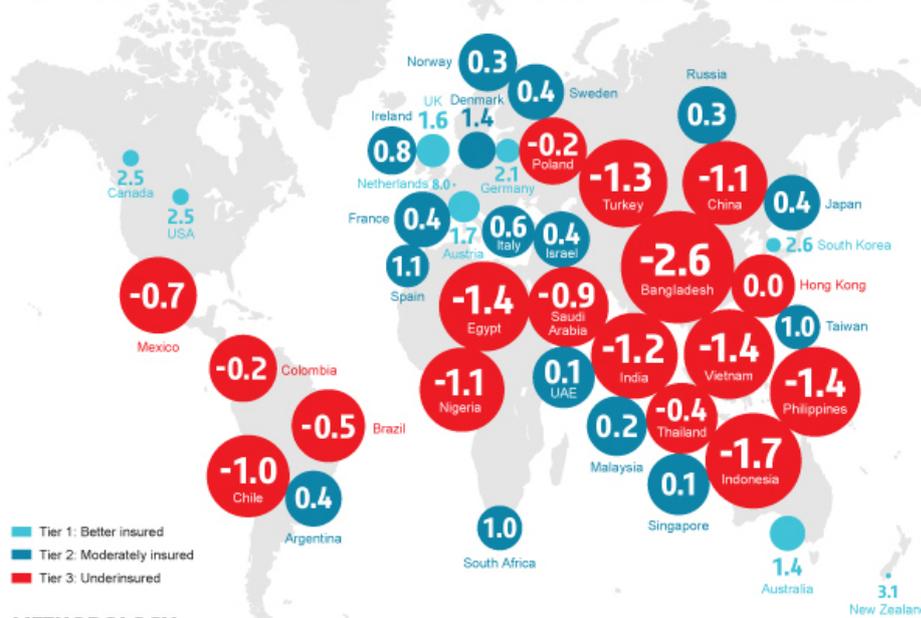
Physical 'self healing' and more resilient networking and capacity management techniques will undoubtedly produce more independence and self control for

submarine cable owners and carriers. As discussed earlier, this should promote the ability to extend repair times and free up maintenance agreements. Although this may mean the use of spot markets this will also promote the opportunity to consider such models as 'self insurance pooling' between likeminded cable owners. Similar to the workings of a maintenance consortium except the investment is not locked up but surpluses could be ploughed back into enhancing further build out. This in effect would remove upfront standby costs from the equation; the pooling allowing buying power in its own right with maintenance providers. Other than freeing up capital, pooling provides the ability to gain control and to stabilise costs over the long-term. There are insurance vehicles which could be adapted to support this scenario and to assist in managing a 'structured' solution around annual contributions or a funding element towards future cable breaks. Insuring multi-year standby charges cannot be directly insured as this is not a fortuity, however such measures explained may pave the way to encompass such costs and with much improved control.

5 CONCLUDING THOUGHTS

In addition to traditional methods of insuring there is now a more holistic and problem solving approach in the insurance market today, which invites more investment in risk mitigation. Submarine cables are exposed to unpredictable and severe forces, and the increasing magnitude of these events suggests it is now more important than ever to be realistic about worse case scenarios, and not to view insurance as part of a cost cutting exercise but a core asset to sound management, and as a means to enhance the use and value of capital.

UNDERINSURANCE MAP



Tier 1: Better insured
 Tier 2: Moderately insured
 Tier 3: Underinsured

METHODOLOGY:



BETTER INSURED

- 8.0 Netherlands
- 3.1 New Zealand
- 2.6 South Korea
- 2.5 US
- 2.5 Canada
- 2.1 Germany
- 1.7 Austria
- 1.6 UK
- 1.4 Australia

MODERATELY INSURED

- 1.4 Denmark
- 1.1 Spain
- 1.0 South Africa
- 1.0 Taiwan
- 0.8 Ireland
- 0.6 Italy
- 0.4 Argentina
- 0.4 Israel
- 0.4 Japan
- 0.4 France
- 0.4 Sweden
- 0.3 Russia
- 0.3 Norway
- 0.2 Malaysia
- 0.1 Singapore
- 0.1 UAE

UNDERINSURED

- 0.0 Hong Kong
- 0.2 Poland
- 0.2 Colombia
- 0.4 Thailand
- 0.5 Brazil
- 0.7 Mexico
- 0.9 Saudi Arabia
- 1.0 Chile
- 1.1 Nigeria
- 1.2 India
- 1.3 Turkey
- 1.4 Egypt
- 1.4 Philippines
- 1.4 Vietnam
- 1.7 Indonesia
- 2.6 Bangladesh
- 1.1 China

BRIDGING THE GAP

How can governments, businesses and insurers bridge the insurance gap between the **INSURED** and the **UNINSURED** world?

INSURERS

- Use risk management partnerships to prevent loss
- Develop new products to meet new risk gaps

GOVERNMENTS

- Allow risk based pricing
- Invest in risk mitigation and emergency services
- Share data with insurance community



BUSINESSES

- Make risk management a board issue
- Be realistic about worst case scenarios and don't view insurance as part of a cost cutting exercise

INSURERS

- Don't just chase short term profit – look at long term opportunities in high growth countries
- Invest in new markets and develop partnership and knowledge

BUSINESSES

- Work with broker community to identify your risks and keep up with changes in value of assets
- Construct a business case based on protection, risk prevention and freeing up capital for growth

GOVERNMENTS

- Invest in risk mitigation and emergency services
- Allow risk based pricing
- Develop local insurers and brokers and provide access to global industry
- Share data with insurance community