

The Benefits of Recycling the right way

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Abstract: Mertech Marine and BT have collaborated with one another to effect the removal of a number of Trans-Atlantic and Domestic Out of service cables. In this paper BT will estimate the benefits of such removals in terms of removing Third Party Legal Liability, reductions in permitting and associated ownership fees and the freeing up of the route to reuse. Mertech will discuss how the benefits of lifting and recycling these specific cables in an environmentally friendly way and the minimal environmental impact there is when lifting the cable from the seabed and importantly the condition of the cables and repeaters when recovered.

1. Introduction

South Africa and Great Britain have a long history, dated back to 1795 when the first British arrived in The Cape of Good Hope (today The City of Cape Town).

The first telegraph cable between South Africa and Great Britain was laid during the 1870's, this cable was laid from the East Coast of South Africa, Kwazulu-Natal all along the East Coast of Africa where it linked up with the Network in the Bay of Aden.

The second telegraph cable was laid from 1899-1901 and was laid from Cape Town via, St Helena Island, Ascension Island, Canary Island, the Madeira Islands and eventually land at Porthcurno, Cornwall.

During the late 1960's South African Post and Telecommunications, British Post and Telecommunications and Portugal Post and Telecommunications established the South Atlantic Cable Company to lay the first Submarine Telephone Cable between

South Africa, Europe and Great Britain, this cable, SAT-1, went live in 1969. At the end of 1993 the SAT-1 was switched off and the SAT-2 cable went live.

This Symbiotic history of PTT's can be repeated worldwide, in fact looking just at the Atlantic, every east to west TAT system and North to South SAT system has been built by PTT consortiums until private cables came along in the late 90's.

In recycling cables it is necessary to acquire them from ALL the previous owners and having ALL parties in agreement that the cable can be recovered. This is because C&MA (Construction & Maintenance Agreements) do not anticipate geographical ownership, they are more concerned with financial percentage ownership in coaxial days or IRU or Capacity ownership in modern fibre systems. This can often be one of the major hurdles in acquisition along with knowing who now owns cables!

2. The Journey of Recycling

Companies over the years have been bought out, changed name or been split up to forming new companies. Most of the out of service cables recovered to date have been pre 1970. This was a time before the internet, email and with computers only just beginning to be used. This can make tracking down who owns what asset very time consuming as the information is often deep in an archive collecting dust!

Once the cable ownership has been established finding someone within that owner company and proving to them that they are the owners and then agreeing with them its acquisition has in many cases taken two years. However, to ensure, even after cables are acquired, that there is no lien or other form of perceived ownership of a cable it is necessary to promulgate the anticipated plan to lift the cable in a number of media avenues such as gazetting and ICPC before a cable recovery can begin.

Cables have been recovered for repair by grappling for over 150 years, an operation aided today by the use of Remote Operated Vehicles (ROVs), intelligent grapnels with grabs. The first successful deep-water operation was the recovery in 1866 by Great Eastern of the lost 1865 cable that was recovered in 1866 and relayed the following year.



Recovering cable is far quicker today than it was 150 years ago but the principles have not really changed significantly.

For recovery purposes as the cable is not being reused you do not have to adhere to bending radiuses or the cable handling

guidelines thus speeding up recovery operations. A 2000km system can take approximately 40 days to recover.

Repeaters are cut out during recovery to speed up the operation and put to one side of the vessel ready to be sent to the south African nuclear lab to remove any hazardous substances.

The quality of the cable recovered is very good and in cool water areas almost as clean as when it was laid. The cable below is a sample taken from the SAT1 cable system on the west coast of Africa installed in 1969 and recovered some 40 years later.



After the cable has been recovered it can be finally recycled. The cable is dismantled the opposite way it was built approximately 100km a day can be recycled in this way. Steel is unwound and used in the local vineyards and farms for fencing. The high quality Polythene is broken down into pellets and used in remolding project worldwide, finally the copper being 99.9% proof is placed on the copper commodity market.

Once the hazardous substances have been removed from the repeater by the licensed Nuclear Physics Laboratory in South Africa, they encapsulate the dangerous goods in glass and place in their underground vaults along with their own spent nuclear products, they raise a certificate and return the remains of the repeater to us to be fully recycled.

With companies like Merteck working in partnership with BT it can not only be a financial benefit removing all third party

liability and freeing up routes for new cable, but can be a huge environmental benefit as well which we will discuss later in this paper.

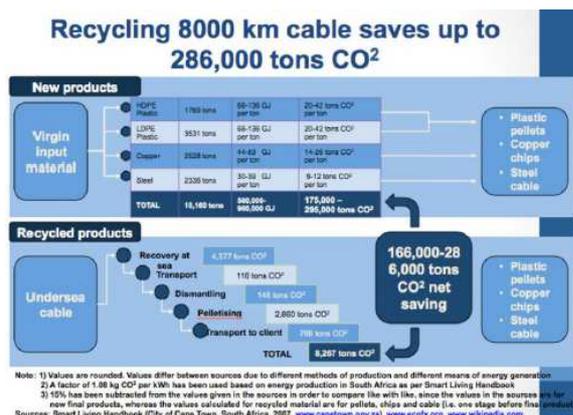
3. Benefits of recycling

Before the year 2000 approximately 1,049,337Km of Coaxial and Optic cables had been installed.

If only half of this were to be recovered when compared with mining or manufacturing the raw materials from scratch 18,756,898 MT of CO₂ would be saved.

Some 35.75 MT of CO₂ emission is saved on a recycled per Km basis.

Certified independently this environmental saving takes into account all the seabed recovery operations, fuel used and the factory recycling, power etc. These major savings are only apparent if recycling is done mechanically as we do, rather than smelting or melting.



4. Recycling requirements

Besides marine operational permits, bringing cable and repeaters into a country you need import licenses, permits and permissions to dispose of goods, almost in the same vein as new cable developers and manufacturers do.

Legal Requirements:

Department of Environmental Affairs and Tourism – Record of Decision (RoD) to authorize the factory process for cable dismantling (which led to us obtaining ISO 9001 and 14001);

Department of Health – Permit to authorize the transportation-, handling-, receiving-, and storing of RA226 and H3 sources and other hazardous goods (Repeaters);

Department of Trade and Industry – International Trade Administration Commission of South Africa (ITAC) – Issued an Import Permit to authorize importation of Submarine Systems;

Nuclear Energy Corporation of South Africa (NECSA) – Dismantles repeaters to remove harmful ingredients Issuing certificates of sources removed before we recycle them entirely

5. Why it all Started?

In the late 1990's, a wine farmer from the Cape region in South Africa stumbled across a piece of "spare cable" at an auction at the Cape Town Harbour. He was flabbergasted to hear that millions of kilometres of cable are "thrown away" after use and laying on the seabed. What started as a hobby and a personal challenge of dismantling the curious cable at his farmstead, turned into a serious worldwide business.

6. Recycling is not for the Faint Hearted!

- Copper down 50% in two years
- Steel down 30% in three years
- Polythene holding its own
- Fuel down 40%

7. BT viewpoint on submarine cables

- Subsea cables are strange beasts, it's a tremendous effort to get a

project off the ground, finding partners with the same interests, funding the cable, getting the right permits in place and finally building the thing before waving that implementation phase goodbye and entering the system into service. Even the in service phase can have its ups and downs, but once that is over and we reach the systems end of life, then what?

- During the 1980's and 1990's the subsea industry reached the optical fibre era and capacity began to expand, and expand and expand. The telecommunication industry across the globe exploded and we entered a new world of privatisation and new start-ups and new regulations. All the focus was on building new systems, upgrading systems, but did anyone pause for think about what happens once the system has served its purpose. In years gone by, the thought was to do nothing.
- A system would reach its end of life or be retired without much thought of any further action. There was rarely a requirement to recover the systems we had installed but all of this soon changed.

8. The Changing Rules and Regulations

Times were changing, as the capacities increased, so did the interpretation of the rules and regulations of landing a subsea cable, consideration and Opex would need to be given to the possibility of having to recover the cable within your territorial waters, and this did not come cheap.

BT was one of several companies that banded together on two separate occasions at great expense, to recovery a number of

out of service cable systems in the late 1990's and early 2000's, removing obligations that I will go further into shortly.



9. The Changing Face of Recovery

In recent times, the face of recovery has changed. There are now companies that offer to recover cables but there is a catch. The cables may have a value as there are precious metals and polythene that can be harvested and recycled. But these companies are not performing this task free of charge. They are able to remove the Opex burden of companies like BT of having to recover the cable ourselves, if the value of recovery costs and recycled value have the right balance.



So, a marriage of interests is formed. Where an agreement is reached that the cable will be recovered solely by a recovery company, they may pay back some of recycling value or share the cables value across consortium owners, or variations on that theme. This has changed the landscape, our seas and oceans are full

of out of service cables dating back many years that now have a cash value and cable owners are keen to cash in.

10. Benefits of Recovery

The benefits of recovery cannot be ignored;

- first and foremost is the optimisation of any end of life/retirement Opex. The need to spend money after the system is retired is almost fully removed and in this day and age this should be attractive to any telco.
- It removes or decreases liability. By removing the cable from the water, we remove it from harm's way.
- Reduction in permit or right of way fees which can be significant.
- It frees up the route and ducts for other uses.
- Any equipment with the inclusion of hazardous components such as repeaters are disposed of in the right careful environmental way.
- The recovery of the cable is environmentally friendly with near 100% of the cable recycled into other goods benefiting all those involved. BT is a company that cares about the environment. Recycled goods include buttons and fence wire. When we build these systems do we ever think it would end its life as a button on a coat.
- Finally, it brings in revenue to the cable owner. Who would have thought 20 years ago that the likes of BT would not spend Opex on the recovery of cable but also make money out of it!

11. Conclusion

We have been laying cables since the mid 1800's, has anyone given any thought as to the number of out of service cables there are across our globe and the revenue that could it generate for the owners?

For those of you out there that never knew this industry existed or never considered that there was a revenue stream in recovery, times are a changing.

The changing face of recovery has its benefits to owners such as BT. The significant savings of Opex, the creation of a new revenue stream and the fact that the cable gets a second life through buttons and wire gives a vote to the environment.

Through our recent contracts with Merteck, we have discovered a company that provides a fully turnkey solution with traceable processes for recycling and disposal of repeaters including their hazardous goods, while recycling in a mechanical way that does not harm or place onerous gases into the atmosphere.

We as BT have only just started identifying cables with potential for recovery so this new era of recovery is gathering pace.

Have you thought about recovery.....

12. References

[1]www.capetown.gov.za, www.ecofx.org, www.wikipedia.com