

ASPECTS OF SUBMARINE CABLE RETIREMENT

Jürgen Ridder

Juergen.Ridder@t-com.net

Deutsche Telecom AG Competence Centre Submarine Cables, Große Mühlenstr. 10, 26506 Norden, Germany

Abstract: Since the development of optical transmission via optical fibres has been improved enormously, the capacity, transported on submarine cables has increased rapidly. But because the Operation & Maintenance costs of older submarine cable systems, carrying lower capacity compared to modern systems are almost the same, all international carriers, involved in submarine cables are showing a high interest in retiring of older submarine cable systems in order to be released from the costs and the duties of the Consortium contract. Scope of this presentation is to provide a guideline for considering the key aspects of submarine cable retirement.

1 INTRODUCTION

Before and during the phase of liberalisation of telecommunication market, many submarine cables have been constructed under the umbrella of submarine cable consortium. All the contractual, commercial and legal arrangements among the involved parties are defined in the Construction & Maintenance Agreement which is the contractual basis for the lifetime of the system. The O&M costs are shared among all co-owners of the system according to the rights of use of each carrier in the system. The major advantage of participation in consortium arrangement is, that the capacity is available up to the retirement of the system and the O&M costs are pure costs bases without overhead and margins. Unless there is a high degree of competition among all co-owners to sell their products on the market, they have the same interest to the commercial success of their submarine cable.

On the other hand, the disadvantage of consortium submarine cables is, that all co-owners are contractually bound to the C&MA for the lifetime of the system. In case, the capacity is not needed anymore or does not fit into the network strategy of the carrier, the O&M costs have to be paid by all parties until the C&MA has been finally closed. The submarine cables, build in the early 90 were constructed to carry about 12 to 24 140 Mbit/s or STM-1 in total. Because of the technical revolution in optical transmission technique, modern submarine cables are able to carry 32 / 64 * 10 Gbit/s or an increasing number of 40 Gbit/s per wavelength, that means, thousands of STM-1 on the cable in total. Since the O&M costs for cables with low capacity are almost the same as the O&M costs for cables with high capacity, the price per MIU has been significantly decreased. That leads to the intention to retire older submarine cables with low capacity. Also private submarine cables have been built within the last years. That means, communication carriers are able to lease or to by capacity on a short notice according to the actual market situation. This could be considered as an alternative to long term commitments in a consortium submarine cable.

Taking into account all the information above, it may be in a high interest of each co-owner, to support the submarine cable consortium in their efforts, to retire a submarine cable earlier than the lifetime design of the system – so called an “early retirement”.

As a result, many submarine cables with a technical design of 25 years are constructed under a C&MA based on a lifetime of 25, 20 or at least 15 years. But In reality, most of the submarine cables are retired much earlier (see Table 1)

2 DECISION FINDING IN A SUBMARINE CABLE CONSORTIUM

Before a decision about early retirement can be taken in a submarine cable consortium, each of the involved carriers should initiate an internal process of decision finding within their own company. It means that the proposal of early retirement has to be discussed by each carrier among several departments, at least the following ones:

- customer departments to identify, whether capacity is still needed or not
- network planning department (for substitution of traffic),
- strategy & Product department,
- financial department for (de-investment, depreciation, etc),
- controlling (the compare expenses and the earnings of the capacity in order to determine the commercial success of the participation).

Once the first step of the internal decision is made by each of the co-owners, the phase of decision finding in the submarine cable consortium will start. In reality, all those activities are sometimes going on simultaneously. In fact, the idea of early retirement could be raised within in the General Committee (GC) of a submarine cable consortium in a very early stage by the chairman or by one of the co-owners. This would give all co-owners sufficient time for internal evaluation. The final decision of early retirement in the submarine cable

consortium may be taken years later. While decision finding in the consortium, each administration has to use their voting rights in order to support or to deny the retirement of the cable. Since Co-owners with a high percentage of capacity could force a decision of early retirement, the smaller co-owners of a cable with low percentage of capacity (e.g. 1 %) may not be able reject such a decision unless they could share their rejecting opinion with other smaller or bigger co-owners in order to bundle up their voting rights to support their decision in the consortium.

In the majority of C&MAs, at least 90 % of the co-owners have to vote for the early retirement of the system, before the cable could be switched off at a determined date. In case, the percentage of votes for early retirement is not reached, all co-owners with a **voting for early retirement** have to accept the continuation of the cable life and they are also still liable for the O&M costs. Co-Owners with a **voting against early retirement** can rely on their traffic routing via that cable. This is the advantage or disadvantage of a trustful environment in a consortium's C&MA

3 COMMERCIAL ASPECTS / CONTRACTUAL ASPECTS

3.1 Commercial Aspects

As mentioned before, most of the consortium submarine cables are constructed with a life time design of 25 years. All companies, involved in the submarine cable consortium, should take the possibility of an early retirement into their account regarding own depreciation philosophy. As a conclusion, not only aspects of network planning strategy may influence the decision of early retirement of a submarine cable, but also financial philosophies of a company.

The budget for the retirement itself is set up and proved by a retirement forum. The majority of the retirement work is performed by the landing point parties in charge of the consortium or by the respective maintenance authorities. The costs are shared by all members according to their percentage of ownership in the submarine cable system.

3.2 Contractual Aspects

During the installation phase as well as during the operation phase of a submarine cable system, a lot of contracts may have been set up for that submarine cable, e.g.:

- Maintenance contracts for all maritime sections (Atlantic, Pacific, and other sea-regions)
- Contracts with spare depots
- Crossing agreements with operators of pipelines, power cables, etc,

- Landing contracts in protected areas
- Contracts for the land cable, routed via private land sections
- Building contracts for the Terminal Stations
- Contracts with power supply companies for feeding the submarine cable
- Contract for Wayleaves

If there are termination costs of some contracts, maybe caused by maturity, such costs are a part of the retirement budget. The early and complete retirement of all contracts is a very important part of the retirement work, because it will release the consortium members from all current and future contractual duties and responsibilities. Also the former Maintenance Authorities of the submarine cable, normally the landing point parties will then be released from all current and future duties and responsibilities in respect to the retired submarine cable system.

The co-owners of submarine cables in the Atlantic and North Sea region have prepared a paper called

“Submarine Cable Withdrawing Principles” One important item of those principles is, that the co-owners should agree to terminate transit contracts (DDP) for all carriers, accessing the submarine cable via the landing point parties network if the contractor will ask for termination. To balance this, the contractor will not ask for a compensation for parts of the upfront payment. Over an average, this leads to a win-win situation.

4 PERMITS / RECOVERY VERSUS NON RECOVERY

4.1 4.1 Permits

Before commencing any retirement work, it is necessary, to obtain all permits which are mandatory to access the areas, where submarine components like cable or earth systems have to be recovered. This maybe a significant workload for the landing points in a retirement project depending on the cable route. The cable may cross nature reserved areas like, shell fish beds, dune landscapes, islands, protected mud flat areas, etc. and there are different local authorities being responsible to give permission commencing that work.

4.2 Cable Aspects

The wording of the initial permission of a submarine cable is very important because it may contain the obligation of recovering the cable after retirement. The obligation of cable recovery is different in most countries and is depending on the rules of the national government. If recovery of the cable is required in the initial permission, the Maintenance Authorities (MA) of the landing points have to recover the cable at least in their territorial waters (12 nm). In respect to the cable, the recovery costs of all territorial sections are

calculated and forming a part of the budget. Those costs are shared among all co-owners proportionately to their capacity share in the system. If the cable is recovered, the national landing point parties and all co-owners, forming the submarine cable consortium are totally released from any risk, related to that cable landing.

In case, the recovery of the cable is not mandatory in the initial permission, the consortium has two options: **Firstly**, to leave the cable on the sea bottom and to save the costs for recovery. In that case, there will be a remaining risk left by the submarine cable consortium. That means, if for any reason, the cable has to be recovered on a later stage, the consortium is still reliable for the system and for the recovery costs. The **Second** choice would be, to recover the cable in any case and to share the costs among all co-owners immediately to avoid future risks.

In some cases, a third party may have an interest in the cable for other use. Sometimes, e.g. universities or scientific companies are interested in the cable for scientific use. The cable could maybe handed over to a third company for only a symbolic price, but the new cable owner has to take over all the risk of that cable, means risk of later recovery costs (laws may be changed) or any risk, caused by accidents with that cable . The submarine cable consortium always tries to “ wash their hands clean” and has a high interest to be released from any risk of that cable.

4.3 Terminal Equipment

Certainly, the equipment in the terminal stations has to be removed anyway. It has to be considered, that submarine cable – and transmission equipment contains a lot of poisoned ingredients. Therefore it is very important, to contract the equipment removal only to certified companies according to ISO 14001 (Environment Management) Those companies are providing certificates for all waste disposal and it is the duty of the maintenance authority of the landing point, to verify the correct waste disposal and to store all certificates.

The costs for that procedure are a part of the retirement budget and shared by the submarine cable consortium

4.4 Spares

The spare parts of a submarine cable system contain different types of spare cable (land cable, single or rock armoured, power – and earth cable) repeaters, jointing houses and consumable kits. Those spares should be removed as early as possible in order to save storage costs. If a submarine cable consortium decides, to give up a submarine cable, it could be released from the maintenance agreements and the spares could be removed from the submarine spare depots earlier than the actual retirement of the cable. That means, if the cable fails before the actual retirement date, it will not be repaired and the traffic will remain on restoration

routes until substitution on other cable systems. This will save the consortium a reasonable amount of money.

Regarding disposal of repeaters, it has to be considered, that a few types of repeaters are containing radio active material and only special qualified companies should be chosen for repeater disposal.

5 ENVIRONMENTAL INFLUENCES

It has been noted, that environmental issues have become more and more important within the last years and especially the public mind has more focus on environmental issues. Because of that, the initial permissions of new submarine cable systems are more and more depending on the environmental handling of not only new submarine cable systems, but also of the old and retired systems. Some telecommunication companies are certified by ISO 14001 and for that reason, the recovery techniques in nature sensitive areas have been improved very much with the aim, to minimise the impact to the nature. Also the good relationship to local authorities have reached a high level of attention in regard to permissions of new submarine cables but also the treatment of retired systems, because the protection of sensitive nature areas is a major item nowadays. This spirit has also improved the public reputation of submarine cables in general.

In some cases, the cable has to be recovered in protected areas like

- nature reserve areas,
- dune landscape on islands,
- mud flat areas (shoal),
- bird hatching areas,
- Coral reefs,
- Shellfish beds

Then the very early contact to the local authorities for permission, is important, because most of that areas are allowing only very small time windows in a year for work performance. In worst case, the consortium has to wait a year or more before commencing the recovery work. Before starting the work, it always should be discussed with the local authorities, which option would be less invasive and aggressive: to recover the cable or to leave it in the protected area. One example is the recovery of earth systems for submarine cables, because deep wholes have to be constructed and big machines have to be used to remove the electrodes.

In such a case sometimes a landing point party is prepared to take over the risk of the not recovered cable end and release the other parties by collecting a certain percentage of proposed recovery costs (e.g. 50 %).

6 MARINE OPERATIONS

According to national laws, in most countries the cable has to be recovered in the national territorial waters, means within the 12 nm zone. Since in most of the cases the cable is not crossing the 12 nm zone directly to the wide ocean, much more cable has to be recovered. As an example, the retired submarine cable TAT-10 D is routed along the German and Dutch coast more than about 95 % within the 12 nm zone.

For recovery of the cable, a cable laying or repair ship from the maintenance agreement can be used. For cost reduction, also other local subcontractors with suitable cable ships should be included in the tender for recovery work.

Before commencing the work in the 12 nm zone, the permission of the local authority of the respective country has to be granted. The cable is hooked by normal standard grapnel procedures and the use of electroding tone will verify, that no other cable will be damaged by accident. Depending on the length of the cable, it is cut on board in pieces of two to 5 meters and stored on board in containers or it is winded on drums. After complete recovery of the cable, it will be transported from the cable ship harbour to the cable disposal factory. It is very important, and has to be included in the retirement documentation, that the cable is disposed to EWC (European Waste Code)

In the areas of crossings with pipelines, power cables or other submarine cables, the retired cable will be cut on the seabed in a security distance of about 1 km on both sides of the crossing element. Both remaining ends of the retired cables will be secured according to ICPC Recommendation Nr. 1) (deep buried in order to avoid any risk to the crossed pipeline, cable, etc).

7 CONCLUSION

To retire a consortium submarine cable is a huge project and many items have to be considered. Only if all aspects of submarine cable retirement have been taken into account and evaluated very carefully in each of the involved administrations, the retirement process will lead to fair and satisfactory results for all members.

8 TABLES & FIGURES

Lifetime of Submarine Cables

Cable	Ready for Service	Retirement	In service (years)
TAT-8	12/14/1988	3/31/2002	13.29
G-P-T	8/31/1989	4/4/2003	13.58
TAT-10 (B)	8/15/1992	7/7/2003	10.89
HAW-4/TPC-3	12/31/1988	9/30/2003	14.75
HONTAI-2	6/30/1990	9/30/2003	13.25
Asean B-S	12/30/1991	10/1/2003	11.75
TAT-9	3/2/1992	12/31/2003	11.83
PTAT-1	12/1/1991	1/31/2004	12.17
TPC-4	10/31/1992	7/1/2004	11.66
BARMAR	1/2/1993	7/31/2004	11.58
NPC	12/31/1990	9/24/2004	13.75
HAW-5	1/31/1993	30.06.2004	11.42
H-J-K	5/31/1990	01.07.2004	14.08
TIE Cable	3/31/1993	10/1/2004	11.50
TASMAN 2	3/1/1992	10/1/2004	12.58
UK-Belgium 5	6/30/1985	12/31/2004	19.50
PacRimWest	3/19/1995	12/31/2004	9.75
UK-Spain 4	6/30/1991	31.12.2004	13.50
CMC	7/31/1993	3/31/2005	11.66
UK-Belgium 6	2/18/1992	12/31/2005	13.83
UK-Germany 5	7/31/1991	12/31/2005	14.42
UK-NL 14	2/7/1997	12/31/2005	8.92
C-J FOCS	12/15/1993	3/31/2006	12.29
Asean M-T	9/22/1994	4/1/2006	11.52
APC	7/31/1993	4/3/2006	12.67
Sea-Me-We 2	7/26/1994	10/1/2006	12.18
ODIN	11/15/1995	12/31/2006	11.12
Rioja	2/28/1995	11/13/2006	11.61
TAT-10 (D)	8/15/1992	12/31/2006	14.38

Average Lifetime: 12.60

Table 1: Average lifetime duration of submarine cables

Letter Agreement

To: TAT-9 Co-owners

TAT-9 Termination of the Construction & Maintenance Agreement (C&MA)

Dear GC-Members,

Pursuant to the unanimous agreement of the TAT-9 General Committee the Submarine Cable System TAT-9 was retired on 31 December 2003.

The recovery of the portions of the TAT-9 Cable System including but not limited to terminal equipment, land cable and submarine cable in European territorial waters was completed by 31 December 2005.

Please note that the US/Canada marine landings have not been recovered as there is no current legal requirement to recover these cables.

The total costs for the recovery work of USD were invoiced by the Terminal Parties and paid by the Parties according to Schedule B of the C&MA. There are no known financial obligations under the TAT-9 Construction & Maintenance Agreement by any of the TAT-9 Parties.

In view of the above and notwithstanding any provision in the C&MA, including but not limited to Clause 23 (a) thereof, the Parties of the TAT-9 C&MA have decided, in a General Committee meeting dated 24 October 2002, to retire TAT-9 and consequentially to terminate the C&MA. The confirmation of this decision by 100% of the Parties was reached on 23 December 2003. In addition, the TAT-9 General Committee meeting of the 8 November 2006 further appointed the Chairman of the General Committee to affect the termination by circulation of this letter which was approved in the said meeting.

The C&MA is hereby terminated on the date of signature of this letter except for any obligations which, by their nature, continue beyond the termination of the TAT-9 C&MA as defined in the C&MA.

Yours sincerely,


 Volkmar Roempke
 TAT-9 GC-Chairman
 DTAG, T-Com

Date 22 Nov 2006

Figure 1: Example of a “Closing Letter”



Figures 2 & 3: Recovery of cable in nature reserved areas



Figure 4: Cable recovery in shallow waters