Chapter 11
Anecdotes

Contents

The professional life of the cable engineer seems to be boring, maybe even desolate. The product he (in rare occasions: she) is working with has reached great technical maturity with no high-tech appeal whatsoever. Submarine power cables have no aesthetic value as no manufacturer so far has spent money to print small fish or sweet little anchors on the outer sheath. The product is invisible in the public life – like a sewage pipe. May be even lesser known to the great public. In contrast to the rocket scientist and the TV talk show leader the cable engineer would speak rather quiet about his/her profession in the dancing hall or in the flirt line.

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Still, sometimes laughter can be heard during coffee breaks in the cable factories, the electro-technical institutes, or during expert conferences. The reason might be a funny story from the strange world of submarine cables. Some anecdotes and little tales are printed in this chapter. All this material is compiled from rumors and tales, sometimes from printed matter[1]. The author hopes to receive more and better stories from the vast treasure out there, for the next edition of this book.

11.1 The Floating Hospital S/S Castalia

The steamship S/S Castalia was built in order to facilitate the Dover-Calais traffic in the 1880s. After a few trial tours it was decided to de-mobilise her and commit her to other duties. Laid off, she was intended to serve as a pest hospital vessel near Dartford, England.

For matters of convenience the vessel should be equipped with electrical illumination. Four submarine cables with extra heavy armoring and an insulation made from vulcanised bitumen were produced by the "Callender Bitumen Telegraph and Waterproof Company". The year is 1889. Vulcanised bitumen had been patented in 1881 and had been used successfully in land cables.

The cable laying was successful onshore. But when the workers got to know that the cable was to be laid to a pest carrying ship, they terminated the work and preferred to attend the near-by "Long Reach Tavern". The duty engineer, George Barnard, soon realised that all attempts to persuade the crew to continue working would be futile.

He rowed the pull wire to the pest hospital vessel, and let the hospital staff pull in the cables. It is untold if also the sick were told to pull. The engineer himself concluded the cable termination work onboard alone [1].

11.2 HVDC Cable Between Lydd, UK and Boulogne, F

"*C/S Dame Caroline Haslett" left Woolwich Cable Works at 24 May (probably 1961) for laying the English part of the cable. She made preps and test runs at the mooring position off shore. At the same time a shore gang made final preps to pull the cable inshore.*

The weather which had been perfect for the French operation, turned worse. It delayed the whole thing and added to the difficulties.

On 7 June the ship was fixed on a mooring point 1400 yards offshore. The cables were pulled out with pull wires towards the beach (winch on beach). Cables supported by air cushions (rubberized canvas air cushions). Cable pull out at 40 ft/min. Suddenly (when 360 yards were out) one air cushion and then two more broke away from the cables.

Chain reaction: Under the increasing weight of the cable all the other cushions were dragged under water and the whole cable pair disappeared. [2]

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[1] Text in *Italics* is reproduced directly from the cited references.

11.3 The Pilot

I had overseen the design, testing, and part of production of this powerful submarine cable. Now I was on board one of the largest cable ships of the world with more than 6000 t capacity, to watch the installation. After years of woes and whoops in manufacturing and testing I would observe how “my” cable would go smoothly into the water.

I sat on the bridge and watched the “pilot”. The pilot is the cable laying chief. He/she commands the speed of all cable laying machinery, the vessel speed, and all other things relevant for the cable laying. By radio he/she controls all the slave cable engines and has the full responsibility for the cable laying operation. As always, the night shift included a certain amount of tiredness and sleepiness. To keep blood pressure positive people on the bridge usually start telling stories and fairy-tales. So I started to talk about an anecdote connected to the Leyte-Cebu cable system, which has been delivered by my company and another one. The Leyte-Cebu system included four single-core cables. Rated 230 kV, the cables were big guys. They were laid in parallel corridors about 1 km apart to make service possible if one cable should brake.

Shortly after laying, all four cables were reported broken and possibly disrupted. Disbelieve and incredulity were the main tempers in the offices of the cable factories. To prevent water from ingress, oil was pumped into the cable from the shore stations at a rate making necessary the air-borne import of new cable oil. It was a terrible mess altogether. During coffee breaks the possible cause of the breaks was discussed, ranging all between dynamite fishing and foreign sabotage. My eight-year-old son suggested a submarine volcano outburst as an explanation.

Later on the real cause became known. Another cable ship, laying a telephone cable for the Philippine Long Distance Telephone Co. across the power cable route had actually fresh sea charts but no information about the newly installed 230-kV cables. The tension curve from the laying displayed four neat peaks with one kilometre or so distance while the telephone cable was ploughed through the power cables.

The pilot listened to my narration with little interest while he watched the data monitors. “My” cable continued to roll out smoothly, and I felt in safe hands. He said, “And do you know who was the pilot on that telephone ship? It was me!”

11.4 S-Lay and Coiling Direction

Each trade has its own unwritten laws. Young engineers entering a design department of a radio manufacturer learn very early that volume knobs on the stereo always are to be turned clockwise to increase the volume. Why is that so? Is there a technical raison-d’être? The junior often does not dare to ask, anxious to avoid disparaging answers.

But why is it as it is? Why do we usually put an S-lay armouring on the cable so that it must be coiled clockwise? Can we do the other way round? Many things come in a left-hand and a right-hand appearance, e.g. screw threads, electric guitars (after Jimi Hendrix), or road lane use. Left-hand driving empires and right-hand driving empires have risen and fallen no matter what.

The S-lay (or left-handed lay) armoring has been described as standard already in 1898 [11.3]. The notable Messrs. R. S. Newall & Co. and Messrs. Glass & Elliot, the first to apply iron wire armouring to electric cables, were in the wire rope business, where right-handed lay was tradition. No question, they produced the first armoured telegraph cables with right-handed lay. However, this lay direction soon led to some unexpected inconveniences. The coiling method of the day was to start coiling from the outer rim of the tank towards the inner hub. Once arrived there the cable would be laid straight outward again, only to start the next flake also from the outside. The guys in the coiling tank, the coilers, now were told to lay the cable clockwise, to accomplish for the armouring lay direction. The coilers found this very inconvenient as they were forced to guide the cable with their *left* hand while they were running around the coiling tank. The only way to overcome this inconvenience was to change the lay direction of the armouring.

Some cable makers listened to their workers later than others. The first transatlantic telegraph cable was made partly by Newall (right-handed lay) and partly by Glass & Elliot (left-handed lay). A splice between these cables would result in undesired untwisting under the influence of strain. This was a major engineering glitch, today possibly called Insufficient Interface Coordination. We do not know what was said in the board room when the mismatch was discovered but I and my fellow

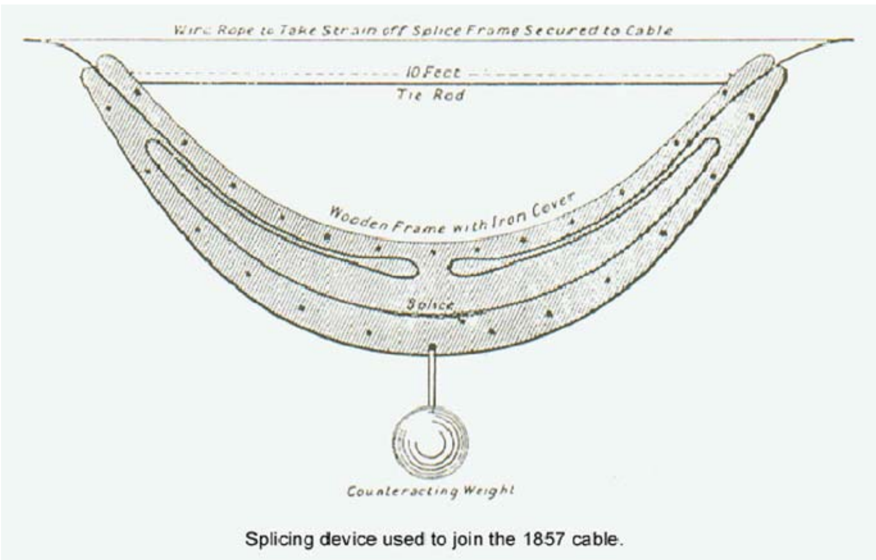


Fig. 11.1 Transition joint between *left-hand* and *right-hand* armoured submarine telegraph cable of 1856 [4] (Courtesy of Bill Burns)

cable engineers only can bow our heads to the ingenious solution conjured up in these days (Fig. 11.1).

11.5 Edible Insulation

There were no given insulation materials in 1875 when the students of the Cornell University wanted to install electric illumination on the Campus. They were in search of a good yet affordable insulation material. It was the time when photography was brought forward by "kitchen chemistry" to find ever better development processes. Under the guidance of their electrical professors the students decided to build up the cable insulation from muslin, a fine fabric. The cable core was impregnated in beef drippings obtained from the local butcher [1]. Unfortunately, no records on the success of this strategy have been found yet.

11.6 Flipper

The North Sea is not always a cosy place for vacation. Many are the cable technicians who have fed the fishes during cable installation campaigns, especially during winter storms. The waves roll in relentlessly under the vessel, making even simple moves on board difficult. Not only easy tasks, such as balancing egg and bacon to the breakfast table, require full concentration but also cable work on deck or in the jointing house can be close to impossible when the vessel is rolling and swaying along.

J. S. and his team had finished a beautiful jointing job on the North Sea. The vessel was about to lay the next length of the power cable. It was decided to transfer the jointing team to shore for other duties. The vessel had no helicopter platform, so a transfer vessel was called in for taking up the jointers team. It is always a tricky thing to enter a rather small transfer vessel from a large vessel. The transfer vessel would approach the large vessel from the lee side, positioning its bow as close as possible to the large vessel. The man to be transferred would hang on a rope ladder outboard of the large vessel, watching the heaves of the bow of the small transfer vessel. The trick is to jump over to the transfer vessel exactly when the bow stands still for a split second on the top of its movements.

J. S. prepared himself for the transfer. His barrel-shaped body filled his orange survival suit completely without as much as a cubic inch of air inside. Familiar with the procedure, J. S. watched carefully the heave of the transfer vessel. After a few wave movements he stepped over on the bow of the transfer vessel. And now something unexpected happened.

Unforeseeably, another wave arrived under the transfer vessel, lifting up the bow with large force and speed. The bow went up like a catapult, sending J. S. right up in the air like an orange Michelin Man. J. S. flew a beautiful ballistic curve before he, head first, smashed into the water. While J. S. was picked up very quickly by the transfer team, a Danish voice rated the flight: "Nine point three!"

11.7 Stamps

The production and laying of submarine cables, may it be telecom or power, is a century-old art mostly unknown to the public. Still, from time to time, the achievements are brought to general attention, and why not by stamps. Submarine cables of any kind are connectivity, and this can be an enormous step forward to island nations, or countries that can be festooned with submarine cables. However, it is not really clear why countries such as Rwanda and Bhutan (each far away from the coast line) memorize submarine cables on stamps issued by their post offices (Fig. 11.2).

Fig. 11.2 The "Great Eastern" on a stamp from Bhutan, 1989. The "Great Eastern" laid the first transatlantic telegraph cable in 1858

11.8 Unusual Cable Ships

The "Great Eastern" shown in Fig. 11.2 was the largest ship in the world of those days, mobilized for this truly great cable-laying job. Not every submarine power cable project of more recent date did enjoy the participation of such an impressive vessel. Cable layers do not need the luxury of the biggest and brightest but make do with anything that can serve their purpose.

Fig. 11.3 (**a**) Purpose-built cable laying arrangement for calm waters. (**b**) Floating cable drum used as laying vessel. (Courtesy of NKT Cables A/S)

Figure 11.3a looks like a cosy installation job in calm waters, a colourful sunshade inviting to an after-hour-drink. However, the howl of the hydraulic gear would make the conversation somewhat inconvenient. Still, this cable laying spread can do its job perfectly well.

The Danish cable manufacturer NKT has successfully used floating cable drums for cable installation. Figure 11.3b illustrates that cable laying vessels can indeed come in many shapes. The floating drum was used for the installation of the Oresund cables between Denmark and Sweden in the 1950s [5]. Obviously, this technique was appropriate for short cable lengths and installation under vacation-like bathing weather, though the Oresund cables were installed in winds up to 10–12 m/s.

Cable installers would probably love to be enrolled on a job using a blimp (airship, Zeppelin) for their task. It is an amazing imagination sitting aloft over hostile swamplands with gaping crocs and poisonous frogs, paying out cable in a pleasant pace and enjoying an inspiring sunset drink. This is what the inventors of the patent application shown in Fig. 11.4 must have dreamt of [6].

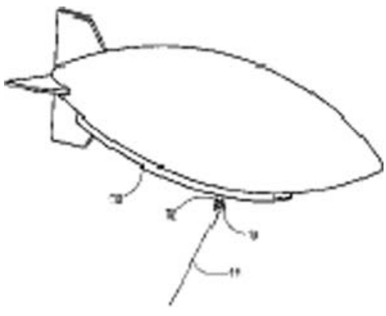


Fig. 11.4 Cable laying airship illustrated in a patent application

11.9 Master Teredo

Not unlike a science fiction creature, the teredo worm is a very nasty submarine animal eating almost everything in its way. It has a rasp-edged shell, which it uses like a buzz saw to cut through wood – or through submarine cables. Cable companies learned the hard way, early on, that it likes to eat gutta-percha, an early plant-sap-based cable insulation.

The following text is taken from a book on submarine cable laying and repair published 1898:

> "*For protection against the teredo the Telegraph Construction and Maintenance Company serve the core with brass tape, a layer of white canvas tape . . . This was introduced by Mr H. Clifford, the engineer of this Company, and has proved the most efficient protection . . .*
>
> *For this purpose also, Bright and Clark's compound, containing mineral pitch, tar, and finally powdered silica is used in alternate layers with jute yarn outside the sheathing wires (sheathing means armouring in this text) by most manufacturing companies. From the success of this compound it would seem that the sensation felt by Master Teredo as his boring-fang touches the sharp glass-like grains is one which he does not care to experience again. The compound, in fact, was devised to render this part of his organisation useless for further exploits of the kind, at any rate on submarine cables."* [3].

Few, if any, cable engineers of today have the opportunity to give name to a particular cable constituent or production process. Still, some respected colleagues have lent their names to production methods. The Hjalmarsson degree of compactness of paper insulation is based on a sophisticated "kick-the-tires" with a cedar-wood pen. Paper insulation can be firm and compact (desirable) or weak and swampy (undesirable). The pitch of the sound when a wooden pencil is knocked onto the cable insulation indicates the quality to the experienced cable engineer. Old fellow Hjalmarsson taught us young guys this lecture.

11.10 Krauts at War Searching for a Cable Break

> "*My father worked in the cable industry in the 1950s and 1960s. He tells an interesting story from the start of the second world war (WW II).*
>
> *Immediately after Britain declared war in 1939, a cable ship was sent out into the North Sea to dredge up the German cables, which ran from Hamburg through the North Sea and out into the Atlantic. They found the cables using a hook, exactly as described in this story, and cut through them.*
>
> *Of course it would be easy for the Germans to go out with their cable ship, dredge up the two ends, and join them back together again – if they knew where to look for the break. And it's not hard to find out how far along the cable the cut is, as a pulse will be reflected from the break. This had been well understood for a hundred years.*
>
> *Knowing this, the British engineers made some sort of contraption full of capacitors and coils that they could fix on to the end of the severed cable before dropping it back into the sea. This would add some extra delay to the reflection, causing the Germans to miscalculate where the break was, and send their cable ship to the wrong place."*

Cited from Internet [7], also referred to in [8].

11.11 Even More Damages

When the first transatlantic telegraph cable showed poor performance due to weak signal transmission, two gentlemen argued about the right cure. One of them was William Thomson, later named Lord Kelvin. The other was Dr. Edward Orange Wildman Whitehouse, a medical doctor, who clearly worked in the wrong field. He suggested, and tried, to cure the cable with 2000 V shocks from his patented induction coils, such ruining the cable insulation for good.

> *Dr. Wildman Whitehouse and his 5-foot-long induction coils were the first hazard to destroy a submarine cable but hardly the last. It sometimes seems as though every force of nature, every flaw in the human character, and every biological organism on the planet is engaged in a competition to see which can sever the most cables. The Museum of Submarine Telegraphy in Porthcurno, England, has a display of wrecked cables bracketed to a slab of wood. Each is labeled with its cause of failure, some of which sound dramatic, some cryptic, some both: trawler maul, intermittent disconnection, strained core, teredo worms, crab's nest, fish bite, even "spliced by Italians."* [9]

11.12 Loops

When a large cable ship installed a large HVDC cable some years ago, the DP system was not really the latest and could hold only a limited number of pre-programmed way points. During the night, the officer on duty fell asleep for a short moment while the vessel automatically traveled along the cable corridor. All of a sudden, the last of the pre-programmed way points was reached and the vessel stopped. Unfortunately, pay-out of the cable continued and an unknown amount of cable was fed over the aft wheel until the vessel started move again. The cable laying operation was finished.

A later inspection however revealed a "beautiful" loop where the cable had been paid out without ship movement. Post-lay trenching was not possible at the location and the cable loop had to be protected by expensive shiploads of rocks.

11.13 Cable Ship Reefs

There are some submarine cable project managers who allegedly uttered a sigh combined with the strong wish to blow up the cable-laying vessel (CLV) involved with their project. For them, it may be a little comfort to know that CLV can be really useful as habitats for corals and fish once they have settled on the sea floor.

On July 25th, 2003, the Government of Caribbean St. Eustatius created its latest reef. The "Charles L. Brown", a 320 ft cable-layer acquired from AT&T, was sunk in 95 fsw and now lays on its side on a clear sandy bottom. The ship was originally constructed in 1954 in Italy and was acquired by Statia's government in 2002. The vessel was prepared for sinking (cleaning of oils and fuel, removal of hazardous waste, opening of safety passages for divers) in an operation managed by a committee of the three island dive operations, the Statia Marine Park and the Statia Tourism office. Today, a few short months after the sinking, divers can explore the wreck and observe as various marine organisms begin to make their home there [10].

The Navy cable ship USS Aeolus is one of the oldest artificial reefs. After a career as warship and cable vessel, she was sunk at her final resting place 22 miles south of Beaufort Inlet off Morehead City, North Carolina, in 1988. She sank on one side, but 1996 hurricane "Fran" turned the wreck through 90°, then righted here and broke here in three [11].

11.14 Poetry

In spite of their unimpressive appearance, submarine cables have been recognized in other literature than engineering books. The author of the Jungle Book, Rudyard Kipling, wrote a poem on submarine telegraph cables, transferring human messages through the unimaginably silent depth of the ocean. The poem goes as follows:

The Deep-Sea Cables

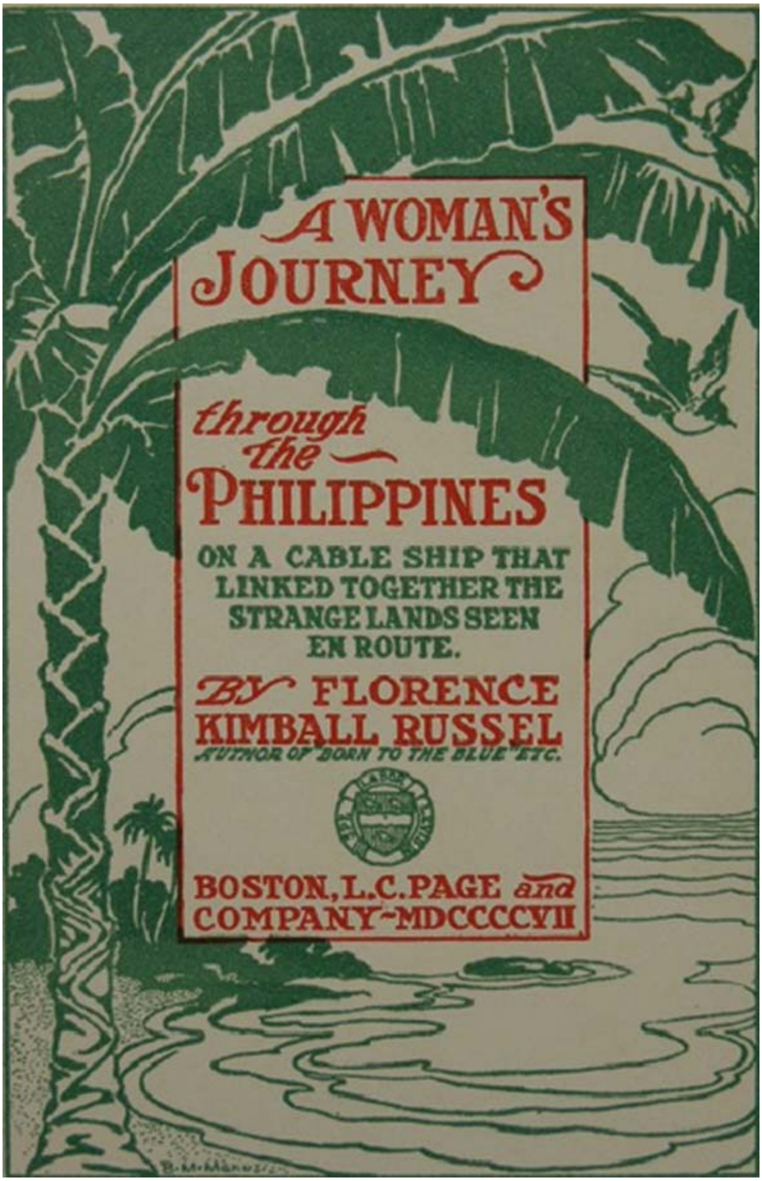
The wrecks dissolve above us; their dust drops down from afar –
Down to the dark, to the utter dark, where the blind white sea-snakes are.
There is no sound, no echo of sound, in the deserts of the deep,
Or the great gray level plains of ooze where the shell-burred cables creep.

Here in the womb of the world – here on the tie-ribs of earth
Words, and the words of men, flicker and flutter and beat –
Warning, sorrow and gain, salutation and mirth –
For a Power troubles the Still that has neither voice nor feet.

They have wakened the timeless Things; they have killed their father Time;
Joining hands in the gloom, a league from the last of the sun.
Hush! Men talk to-day o'er the waste of the ultimate slime,
And a new Word runs between: whispering, "Let us be one!"

11.14.1 The Journey of Mrs. Florence Kimball Russel

The figure shows the front cover of a book by Florence Kimball Russel, published in 1907. Mrs. Russel tells us about a long journey on a cable ship through the Philippine archipelago. Mission: installation of telegraph cables between the islands.



Mrs Russel writes:

"Whether we are picking it up, or paying it out; whether it is lying inert, coil upon coil, in the tanks like some great gorged anaconda, or gliding along the propelling machinery into some other tank, or off into the sea at our bow or stern; whether the dynamometer shows its tension to be great or small; whether we are grappling for it, or underrunning it; whether it is a shore end to be landed, or a deep-sea splice to be made, the cable is sure to develop most alarming symptoms, and some learned doctor must constantly sit in the testing-room, his finger on the cable's pulse, taking its temperature from time to time as if it were a fractious child with a bad attack of measles, the eruption in this case being faults or breaks or leakages or kinks..." [12].

No doubt, a book worth reading for a cable engineer. It not only pictures the worries of a cable installer, particularly at sea, but also reveals a great insight in the contemporary conditions in the archipelago.

Let me conclude this book with the words of Mrs Russel:

Life on a cable-ship would be a lotus-eating dream were it not for the cable.

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