

History of the Atlantic Cable & Undersea Communications

from the first submarine cable of 1850 to the worldwide fiber optic network

German Cable Companies by Bill Glover

FELTEN AND GUILLEAUME

Felten and Guilleaume, a firm of wire rope makers established in Cologne in 1823, were one such company who decided to branch out into the submarine cable industry.

The owner of the Kuper Wire Rope Company, whose factory was on the Surrey Canal at Camberwell, London, was a close friend of Theodor, one of the three Guilleaume brothers

involved in the company. Kuper undertook part of the armoring of the 1851 Cross Channel cable being sub-contracted by R.S. Newall and Company. Using the experience gained in this work the two devised a successful method of armoring gutta percha core produced by the Gutta Percha Company. Kuper sold his company in 1854 to Richard Glass, who with George Elliot formed the firm of Glass, Elliot and Company.

It was in 1854 that Felten and Guilleaume manufactured and laid their first cable. It ran from Stralsund to Danholm Island and then to Graherfahre, a distance of less than 1 nm. 1856 saw a cable laid across Lake Constance, a distance of 7 nm, followed by a 4 nm cable between Vinkenpolder and Norderney in 1858. A second cable was laid across Lake Constance in 1862, at 10½ nm the longest cable manufactured to date. After an eight year gap another cable was laid, Borkum - Juist - Norderney, a distance of 22 nm. Over the next ten years the a few short cables were produced to link the Friesian Islands. The next cable the company produced was a joint venture with Siemens and Halske in 1880, for a 12 nm cable to connect Pellworm to the islands of Amrum and Hooge. The vessel used was the government owned steamer *Delphin*.



As in England, the early manufacturers of submarine cables were wire rope makers who embraced the new industry

To improve links to the Atlantic cables the German Union Telegraph Company had a cable laid to Valentia. The cable from Emden to Greetsiel was manufactured by Felten and Guillaume and the one from Greetsiel to Borkum and Valentia was manufactured by Telegraph Construction and Maintenance Company, who used [CS Scotia](#) and CS *Kangaroo* to install the cable. In 1911 the cable was diverted into Brest by CS *Grossherzog von Oldenburg* to form a link from Borkum, the rest of the cable being abandoned.

FELTEN & GUILLEAUME,
CARLSWERK, MÜLHEIM-ON-RHINE.

TRADE MARK  REGISTERED.

Iron, Steel, Copper, and Bronze Wire Drawing Mills; Wire Ropery; Wire Goods and Metal Factory; Galvanizing Shops; Copper Smelting Works; Electric Cable Factory for Telegraph, Traps, and Electric Light Cables, System Wires, etc.

ELECTRICAL LEADS AND CABLES
For all Purposes.

SUBMARINE TELEGRAPH CABLE.

Gutta-Percha Insulated with Double Sheathing of Round Galvanized Wires.



PATENT TELEPHONE CABLE,
With Paper and Air Space Insulation. Diameter 0.025. Manufactured per Mile for Submarine use, sheathed with Flat or Laided Wires.



CABLES
For Electric Lighting and Transmission of Power.

1898 F & G cable advertisement

Between the wars Felten and Guillaume manufactured loaded cables which were laid in German waters as well as Scandinavia and the North Sea. Similar work was carried out during WW2, mainly in the Baltic. They were also involved in supplying replacement cables for repairs and replacement work after WW2.

After the war Felten and Guillaume developed a repeater to their own design and in 1956 tried it out in the Arendal, Norway - Hirtshals, Denmark, cable into which three repeaters were inserted. A second trial took place in 1957 when five repeaters were inserted into the [Great Northern Telegraph Company](#) cable between Weybourne, England, and Fano, Denmark.



F & G meter stamp
Image courtesy of Jos Wessels

The first complete system in which NSW made the cable and F&G made the repeaters was the cable laid between Mielno, Poland, to Bornholm and then to Avedöre near Copenhagen, Denmark. CS *Nordenham* laid the main cable with CS *Edouard Suenson* laying the shore ends at Bornholm and Mielno and CS *C.E. Krarup* laying the shore ends at Bornholm and Avedöre. The Bornholm - Mielno section is 77 nm long with four repeaters and the Bornholm - Avedöre section 105 nm with ten repeaters. Another cable manufactured by the two companies was the ICECAN section of the SCOTICECAN cable. The final such cable was the Eastern Test Range No 1 for the United States Air Force, consisting of 336 nm of cable with nineteen

repeaters laid between Grand Turk and Ramey Air Force Base, Puerto Rico, and 377 nm of cable with 21 repeaters between Ramey and Coolidge Air Force Facility on Antigua. CS *Neptun* (3) laid the main cable and CS *Omega* laid all the shore ends.

In 1964 Felten and Guilleaume leased their repeater factory to the United States Underseas Cable Corporation and all subsequent output was used by that company.

Felten and Guilleaume gave up the manufacture of submarine telephone cables but continued to manufacture submarine power cables as well as other types of cables. In 1998 Moeller GmbH acquired 90% of the shares of the group. In 1999 the company was sold to the Danish firm NKT, but retained its name until 2000 when the two cable divisions were merged to become NKT Cables.

INTERNATIONAL CONNECTIONS

The first international connection was laid in 1858 for the Submarine Telegraph Company by Glass Elliot and Company using CS *William Cory*. The cable ran from Cromer, England, to Emden and Norderney, Germany. The first such connection by the German government was between Prussia and Sweden, linking Stralsund, Rugen and Trelleborg, this being laid in 1865 by W.T. Henley who manufactured the cable and used CS *Caroline* to lay it.

Two cables were laid between England and Germany, one in 1866 and a second in 1871. The first ran from Lowestoft to Norderney and was operated by the Submarine Telegraph Company for Reuters Telegraph Company; it formed the first leg of the [Indo-European Telegraph Company's](#) line to India. The cable was manufactured by the Telegraph Construction and Maintenance Company who used CS *William Cory* to install it. Later it was taken over by the British GPO. The second linked Lowestoft, Borkum and Greetsiel and was owned by the German Union Telegraph Company, but maintained by the British GPO. This cable enabled Germany to connect to the Atlantic cables of the Anglo American Telegraph Company via the British inland telegraph system.

To eliminate the need to use foreign cables, a new company, the German Submarine Telegraph Company, was formed in 1896 by Felten and Guilleaume to undertake the laying of an Atlantic cable. The route was Greetsiel - Borkum - Vigo - Azores - New York. The Telegraph Construction and Maintenance Company were contracted to manufacture and lay the cable. CS *Scotia*, CS *Calabria* and CS *Britannia* (2) were used to lay part of the cable, between Greetsiel and Vigo, before the scheme was abandoned.

GERMAN ATLANTIC TELEGRAPH COMPANY

Three years after this, Felten and Guilleaume set up another company, the German Atlantic Telegraph Company, with the intention of laying a cable, [Greetsiel - Borkum - Azores - New York](#). The Telegraph Construction and Maintenance Company was contracted to manufacture the cable, with Felten and Guilleaume supplying the core and armouring. CS *Anglia* and CS *Britannia (2)* were used to lay the cable with CS *Britannia (2)* carrying out a survey of the route between Borkum and the Azores prior to the actual laying. The section between Germany and the Azores opened for business on 26 May 1900 and the complete cable on 28 August 1900. The New York landing point was at the [Coney Island cable house](#) of the Commercial Cable Company.

A second cable was laid over this route during 1903-4, the cable being manufactured in Germany by Norddeutsche Seekabelwerke and laid by the company cables ship CS *Stephan* with CS *Von Podbielski* assisting. The Emden - Azores section and the New York shore end were laid in the summer and autumn of 1903, and the New York - Azores section in the early part of 1904, with the cable being open for business on 1 June 1904. In that year the German Submarine Telegraph Company was taken over by the German Atlantic Telegraph Company.



At the end of World War I the above cables were handed over to France and Great Britain as war reparations. They were divided up as follows:

1900 Borkum - Azores. Diverted into Porthcurno in 1917 by CS *Colonia* and operated by the GPO until 1929, then handed over to Cable & Wireless.

1900 Azores - New York taken over by the French PTT.

1903 Azores - New York. Diverted into Halifax, Nova Scotia, by CS *Colonia* in 1917 and operated by the GPO until 1929, then handed over to Cable & Wireless

1903 Borkum - Azores. Diverted into Brest for use by the French PTT.

After the first world war Germany found itself once again in the position of having to rely on foreign cables to reach the USA. In 1926 a continuously loaded cable was laid between Borkum and Fayal, Azores, for the German Atlantic Telegraph Company. The cable was manufactured by Norddeutsche Seekabelwerke and laid by their new cable ship CS *Neptun (1)*. At Fayal a connection was made with the Western Union loaded cable to New York. A

new link between Emden and Vigo was established in 1929, with CS *Norderney* laying the cable.



Joint Anglo, German and American Cable Station, Fayal, Azores

In 1940 CS *Faraday* (2) recovered a large part of the Emden - Vigo cable for use elsewhere and the Borkum - Fayal cable was [diverted into Cherbourg in 1944](#) for use by United States forces based in Europe. After the second world war both cables were restored to their original routes.



Laying cable from the Cable Hut to the Cable Station
(date unknown).

GERMAN-NETHERLANDS TELEGRAPH COMPANY

Felten and Guilleaume also played a major part in the formation of this company. Its role was to link the German Pacific Colonies into the main submarine telegraph networks.

The cable ran from Menado, Dutch East Indies to Yap and Guam. At Yap a spur was run into Shanghai. At Menado links to the Eastern Extension cables were available and at Guam cables owned by the Commercial Pacific Cable Company provided connections to the USA and Philippines. At Shanghai the [Great Northern Telegraph Company](#) had cables linking Europe and China. A total of 5000 nm of cable was manufactured by Norddeutsche Seekabelwerke and with the exception of 45 nm laid in the Yangtse river estuary by *CS Store Nordiske*, the whole of the cable was laid by *CS Stephan*.



CS Stephan off the New Guinea coast, laying the Dutch East Indies - Yap - Guam cable

At the end of World War I the above Pacific cables were split between the British, American and Japanese cable companies operating in the area.



German-Netherlands Telegraph Company
District Office and Cable Station, Yap.
Insel Jap (Karolinen). Deutsches Bezirksamt u. Kabelstation
d. Deutsch-Niederl Telegr.-Gesellschaft

CS Stephan is at centre right. Dated 2 July 1908, the card was

sent to a member of the staff of the German Atlantic Telegraph Company Cable Station at Vigo, Spain.



EASTERN EUROPEAN TELEGRAPH COMPANY

This was another of the family of companies set up by Felten and Guilleaume, this time to link Constanza, Roumania, to Constantinople, Turkey. Norddeutsche Seekabelwerke manufactured the cable and used CS *Von Podbielski* to lay it. After this task the cable ship was sold to the Dutch East Indies Government. It carried a cable made by Norddeutsche Seekabelwerke and laid it between Balikpapan and Macassar. The vessel was renamed CS *Telegraaf* by its new owners.

GERMAN SOUTH AMERICAN TELEGRAPH COMPANY

Another member of the ever growing family set up by Felten and Guilleaume. This time it was to link Germany with South America. 5000 nm of cable was ordered from Norddeutsche Seekabelwerke. The route was Borkum - Tenerife - Monrovia, Liberia - Pernambuco, Brazil. Work commenced in 1908 and it was three years before the job was completed. Later the company laid a cable from Monrovia to Lomé (Togo) and Duala in the German Cameroons. A cable was also manufactured and laid for the French PTT, linking Conakry, French Guinea and Grand Bassam, Ivory Coast to Monrovia. CS *Stephan* laid all of these cables.



Togo - Lomé Cable Office

Early in World War I the German South American cable was cut in the English Channel. In 1915 it was suggested the cable should be diverted into Brest, Casablanca, Morocco, and Dakar, Senegal for use by the French. CS *Dacia* made a trial recovery north of Tenerife and, finding the cable to be in good order, subsequently re-laid the other end to France. Diversion of the cable into Dakar followed, and it was in December 1915 while returning from this expedition that CS *Dacia* was torpedoed and sunk by a U-boat.



Recovered cable section marked:

EMDEN-TENERIFE GERMAN CABLE
PICKED UP BY THE DACIA &
RELAID FOR FRENCH
GOVERNMENT 1915

Image courtesy of Nicky Hibbin

The Tenerife, Monrovia, Lomé and Duala cables were taken over by the Eastern Telegraph Company and the French PTT at the end of the war.

NORDDDEUTSCHE SEEKABELWERKE A.G.



NSW factory at Nordenham

In 1898 the first steps were taken to set up a submarine cable factory in Germany with the formation of Land-und-Seekabelwerke A.G. A site for the new factory was found at Nordenham on the Weser. On 27 May 1899 a new company, Norddeutsche Seekabelwerke A.G. (NSW), was set up by Felten and Guillaume and the German Atlantic Telegraph Company to take over the factory and the cable ship which had been ordered from Dunlop's of Glasgow. The first major cable manufactured by the new company was the 1903-4 Atlantic cable.

1907 saw the manufacture and installation of a 904 nm cable between Moen, Denmark - Liepaja and Petersburg, Russia, for the [Great Northern Telegraph Company](#) and laid by CS *Stephan*. The [Central and South American Telegraph Company](#) ordered a 704 nm cable in 1912, to be laid between Balboa and Santa Elena. Once again CS *Stephan* was used. In 1913 CS *Stephan* laid 720 nm of cable between Balikpapan - Soerabaja and Kema - Ternate in the Dutch East Indies.

The last major cable laid in this area was in 1921 and was manufactured by Norddeutsche Seekabelwerke, who chartered the Norwegian steamer *Flint* to lay the 1710 nm of cable linking [Soerabaja - Macassar - Donggala - Menado](#).

As the company had forfeited the only cable layer it owned, in order to be able to offer a full manufacturing and installation service it purchased a former oil tanker, the *Norderney*, and converted it into a cable layer, retaining its original name.

In 1921 the German Atlantic Telegraph Company sold its interest in NSW to Felten and Guilleaume. Ten years later Siemens and Halske acquired half the share capital of NSW and in 1995 acquired the remainder.

In 1924 [Italcable](#) ordered two cables from the company, the first of 1005 nm for laying between Anzio, Italy - Malaga, Spain, by CS *Citta di Milano (2)*, and the second, 870 nm of cable laid between Malaga - Las Palmas, Canary Islands, by the same ship. With this contract NSW found itself chartering a cable ship it formerly owned, CS *Grossherzog von Oldenberg*, which had been handed over to the Italians at the end of WWI and renamed CS *Citta di Milano (2)*.

In 1928 Bell Telephone Laboratories (AT&T) developed a system of submarine telephony and in the process made a new kind of insulation known as "Paragutta". Bell offered manufacturing rights to the Telegraph Construction and Maintenance Company, who for reasons best known to themselves turned the offer down. It was then offered to NSW who after two years of development work produced 111 nm of co-axial cable which was laid between [Key West and Havana](#) by CS *Neptun (1)*. The cable opened for service on 6 June 1931.

As well as supplying the major cables listed above, NSW manufactured many cables laid in the Baltic, Scandinavian waters and the North Sea. After the end of WW2 NSW supplied many nm of cable for repairs to all the networks that had been neglected throughout the war.

Like other cable companies NSW turned its attention to the manufacture of co-axial cable and a number of joint ventures were carried out with Felten and Guilleaume (see above). After F&G leased its repeater works, NSW produced 1000 nm of cable for TAT 2, 500 nm for the West Palm Beach, USA - San Juan, Puerto Rico cable and 1200 nm for TAT 4. Shortly after this, a fire destroyed the armoured cable production line and in the following year NSW sold off their armourless cable facility to the [Simplex Wire & Cable Company](#). The armoured cable side was rebuilt, although it was a number of years before production restarted.



Siemens & Halske acquired 50% of the shares in Norddeutsche Seekabelwerke in 1931 and the remaining 50% in 1995



In 2000 [NSW](#) became part of the Corning Inc. group of companies and now specialises in the production of high capacity, high quality, repeaterless fibre optic systems. The company joined the General Cable Corporation in April 2007.

CABLE SHIPS

[VON PODBIELSKI](#) - see main page for this ship

Built 1899 by D.J. Dunlop and Company, Port Glasgow.

Length 265.5 ft. Breadth 35.1 ft. Depth 22.4 ft. Gross tonnage 1494

Built for Norddeutsche Seekabelwerke for cable repair work. Sold to the Dutch East Indies Government in 1905 and renamed CS Telegraaf.

POSEIDON

Built in 1902 by Bremer Vulkan

Length 150.1 ft Breadth 29.8 ft Depth 14.8 ft Gross tonnage 453



Used in Bremerhaven on harbour defence work.

RANDULF HANSEN

Built 1906 by Fevigs Jernskibsbyg

Length 246.25 ft. Breadth 35.5 ft. Depth 17.75 ft. Gross tonnage 1287



A Norwegian freighter chartered by NSW from August 1917 to October 1921 for laying short cables.

FLINT

Built 1908 by W. Dobson and Company, Newcastle upon Tyne.

A Norwegian freighter chartered by NSW to lay a cable for the Dutch East Indies Government; Soerabaja - Macassar - Donggala - Manado.

JOHANNA

Built 1912 by Stettiner Oderwerke

Length 210.8 ft. Breadth 30.8 ft. Depth 12.8 ft. Gross tonnage 860

Used to lay the 10 nm shore end cable at Borkum of the 1926 Borkum - Azores cable.

NORDERNEY

Built 1915 by Howaldtswerke, Kiel

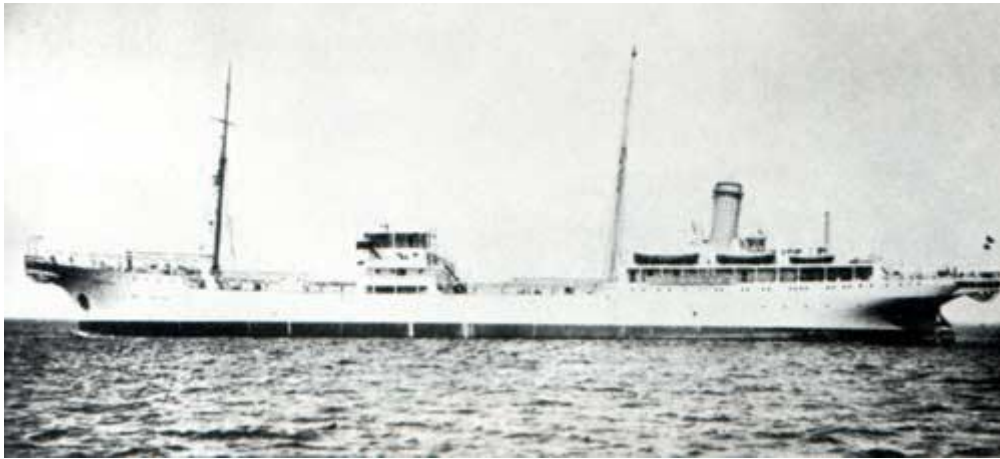
Length 233.00 ft. Breadth 34.4 ft. Depth 17.5 ft. Gross tonnage 1460

Built as an oil tanker for the German Navy. Purchased by NSW in 1922 and converted for cable repair work by Deutsche Werke, Rustringen. Handed over to the GPO after WW2 as war reparations for the loss of CS *Alert* (2) and CS *Monarch* (3). The vessel was renamed CS *Alert* (3) and remained in service until February 1960 when sold for scrap.

NEPTUN (1)

Built 1926 by Blohm and Voss, Hamburg

Length 434.3 ft. Breadth 57.3 ft. Depth 32.2 ft. Gross tonnage 7481



Built for use as a cable laying ship or oil tanker. Handed over to the British government at the end of WW2 as war reparations. Sold to Hector Whaling Ltd., who changed her name to *Thule*. Used as a supply ship and whale oil transporter. Offered to Submarine Cables Ltd. after the loss of CS *Ocean Layer* but the offer was not accepted. Sold to Belgian shipbreakers for scrap in January 1961.

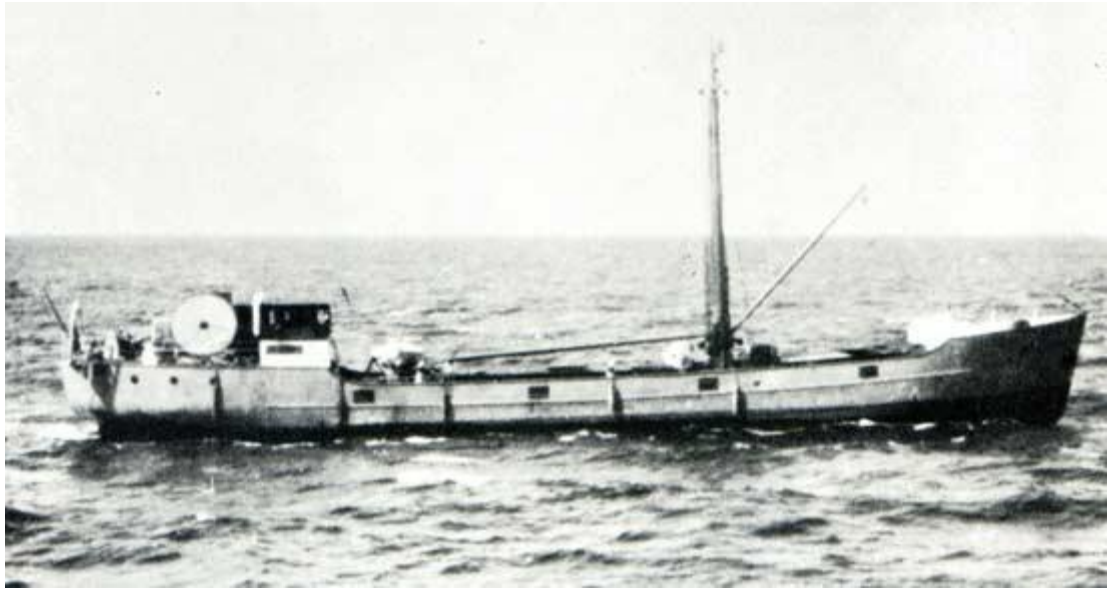
CABLE WORK

- 1926 Borkum, Germany - Fayal, Azores
 - 1926 Aldeburgh, England - Domburg, Holland
 - 1930 Key West, Florida - Havana, Cuba No 4
 - 1934 Gross Mollen - Pillau, Germany
-

ELVESHORN

Built 1937 by Kremer and Son, Elmshorn.

Length 117.9 ft. Breadth 22.2 ft. Depth 7.6 ft. Gross tonnage 199



Built as a coaster for Elmshorner Dampfscheppschiffarts AG. Chartered by NSW on a number of occasions including the whole of WW2. Handed over to the Netherlands PTT at the end of the war and renamed *CS Poolster (1)* and used as a repair vessel. Handed over to the French PTT in June 1949 and renamed *Ingenier-en-Chef Hanff*

Sold out of the cable industry in 1954. See the [main page on this ship](#) for further details.

JOP

Built 1937 by Werft Berninghaus, Koln-Deutz

Length 123.8 ft. Breadth 22.4 ft. Depth 7.6 ft. Gross tonnage 212



Built as a coaster and chartered by NSW from 1939 until 1950.

NORDERAU

Built 1938 by Defchimag, Werk Seebeck, Bremerhaven

Length 273.9 ft. Breadth 41.3 ft. Depth 15.4 ft. Gross tonnage 1453



Chartered by NSW from Bugfier-Reederei und Bergungs from 1941 until 1945 for cable work. Handed over to the British in 1945 and then to the Russians and renamed *Klavdya Nikolaeva*.

HOWEWEG

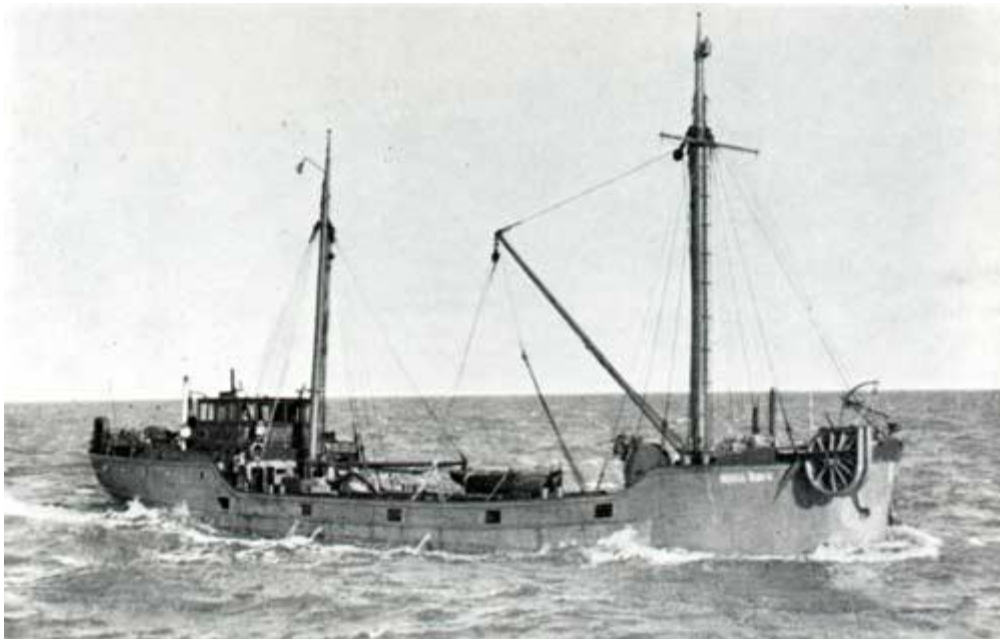
Built 1938 by Busching & Rosemeyer, Minden

Length 137.8 ft. Breadth 22.8 ft. Depth 9.33 ft. Gross tonnage 268

Built for Captain D. Ahrens and chartered by NSW on completion until 6 August 1944 when sunk by artillery fire off the French coast.

DIETRICH AHRENS

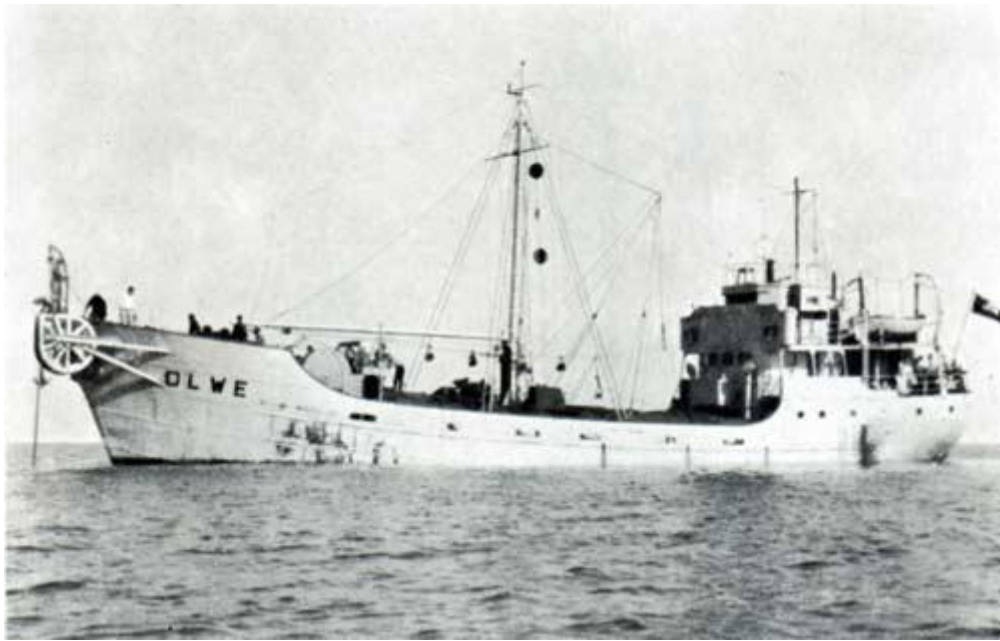
Dimensions, builder and owner identical to *Howeweg*. Chartered throughout WW2 and returned to its owners in 1945.



OLWE

Built 1940 by N.V. Schpsw, Foxhol.

Length 124.9 ft. Breadth 23.1 ft. Depth 8.0 ft. Gross tonnage 273



A Dutch coaster taken over in 1943 for cable repair work. Handed back to its owners in 1945.

BUTJADINGEN

Built 1942 by C. Luhring, Brake

Length 167.3 ft. Breadth 27.5 ft. Depth 10.9 ft Gross tonnage 466



Built for cable repairs. In service from 3 November 1942 until 24 March 1945 when sunk off Bornholm by aircraft.

KABEL-JAU

Built 1944 by Kalmar Varv.

Length 162.4 ft. Breadth 29.75 ft Depth 13.5 ft. Gross tonnage 500



Built as a coaster and named *Tessy*, renamed *Delfin* in 1957 and back to *Tessy* in 1961. Purchased by Norddeutsche Seekabelwerke in 1966 for cable repairs in coastal waters and once again renamed this time to *CS Kabel-Jau*. Sold out of the cable world in 1971.

HUMMEL

Built 1948 by Werft J.J. Sietas, Hamburg-Neuenfelde.



Built as a dual purpose vessel, freighter and cable ship for G & E Bartels. Used by NSW from when the vessel was completed up until 1964.

IRMGARD PLEUGER

Built 1952 by Werft Nobiskrug, Rendsburg.

Length 277.0 ft. Breadth 37.7 ft. Depth 16.0 ft. Gross tonnage 1834

Built as a cargo vessel for the Pleuger company. Chartered for cable work from June 1952 to July 1953.

NEPTUN (2)

Built 1955 by Furness Shipbuilding Co. Ltd.

Length 467.25 ft. Breadth 59.00 ft. Depth 29.2 ft. Gross tonnage 8299

Built for Northern Steamships Ltd., Johannesburg and named President Kruger. Purchased in 1959 by Union Kabelgungs and Schiffarts GmbH., a company in which Norddeutsche Seekabelwerke and Felten and Guillaume had a majority shareholding and renamed *Neptun (2)*. The intention was to convert it into a cables ship but this scheme was abandoned and the vessel was sold to Muhammadi SS Company and renamed *Al Murtaza*

NORDENHAM

Built 1956 by Werft J.J. Sietas, Hamburg-Neuenfelde.

Length 193.3 ft. Breadth 39.12 ft. Depth 12.17 ft. Gross tonnage 1099



Built for G & E Bartels and chartered by NSW from completion. Used for cable repair work. Also chartered to Western Union for cable repair duties. Lost on 10 May 1963 after a collision in the River Weser.

Vessels described elsewhere on the Atlantic Cable site:

NEPTUN (3) Built 1962, Lubecker Flenderwerke A.G. Refitted in 1975 and renamed [CS Cable Venture](#) in 1977.

GROSSHERZOG VON OLDENBURG - See [CS Citta di Milano \(2\)](#)

[STEPHAN](#) Built 1901, Stettiner Vulkan, Germany

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