SHIPSLIST 223

FERRO - CONCRETE SHIPS

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A number of people have asked me to put on paper the various notes I have collected regarding concrete ships. In doing this, I must point out that when it comes to listing the vessels, I fully realise that there are some gaps. If anyone reading these notes is prepared to fill any of those gaps, his assistance will be greatly welcomed.

It is widely but erroneously believed that the ferro-concrete ship was born of the necessities of the First World War. In point of fact, there had been sporadic building in this material for some 70 years prior to 1914, and by the end of 1917, some 200 hulls of all types had been built in various parts of the world. (i). It would be correct, however, to say that the SEAGOING concrete hull became a practical entity due to work on the associated problems during and immediately after that conflict.

The first patent for the design of a concrete ship capable of deep-sea trading appears to have been taken out in 1912 by a Norwegian named N.K. Fougner, but it was not until 1916 that he was sufficiently confident of his ability to overcome the many technical difficulties as to enable him to undertake the building of such a ship. While working at Manila, in the Philippines, some years before, he had had practical experience in the building of a concrete lighter, and later built some lighters and harbour craft in Norway (ii). An ocean-going concrete ship, however, was another matter.

Unable to find a shipowner willing to place a firm order, Fougner's firm, at Moss, built at its own risk a motorship named NAMSENFJORD. Measuring 84' x 20' x 11.5', she had a deadweight capacity of 200 tons and her 80 b.h.p. Bolinders diesel, situated aft, was designed to give her a speed of 7 1/2 knots.

She started her career badly by 'sticking' on the launching ways when attempts were made to launch her on 25th July, 1917, and was finally lifted into the water by a Norwegian Navy floating crane eight days later. (ii).

In the meantime, and before this contretemps, Fougner had been able to interest a couple of Norwegian shipowners in his project. On 8th May 1917 a Mr. G. Brekke of Oslo, contracted for the building of a 1,000 tonner, and later in the same month Mr. G.M. Bryde, also of Oslo, signed up for a 600 tonner. (ii). Bryde's vessel, named STIER, was launched on 7th March 1918 and tried on 17th May 1918 (ii). A flush-decker, measuring 145' o.a. (140' b.p.), with a beam of 27'6" and a depth of 15'9"; her gross tonnage was 462, and she was powered by a 320 b.h.p. Bolinders diesel, situated aft. Brekke's ship, launched as ODDFRID, and later renamed ASKELAD, also a flush-decker, had a gross tonnage of 758, measured 176' o.a. (170' b.p.) by 31' by 19', and had a similar engine to that in STIER. Again machinery was placed aft. STIER was launched on 8th June 1918, and tried on 21st August 1918 (ii).

STIER was sold to Greek owners, became ALIAKMON, and was dropped from the Registers about 1923. ASKELAD is still in the 1925 Registers but I cannot trace her after her sale in June 1925.

UNITED STATES OF AMERICA

As in the United Kingdom, private enterprise in the U.S. paved the way for the Government's programme of concrete shipbuilding. Fougner visited the United States in 1917 to present his suggestions to the Shipping Board. While there, he met two Californians, MacDonald and Foss, who were interested in concrete ships. They set up the San Francisco Shipbuilding Co. at Redwood City, Calif., and in September 1917 (v) began the construction of the ship which ultimately became the FAITH, the first seagoing steamer built of concrete in the U.S.A. Launched on 14th March 1918 (v), she measured 320' by 44'6" by 30', had a deadweight capacity of some 4700 tons, and was powered by triple expansion engines, giving her a designed speed of 10 knots. It is interesting to note that while her estimated cost was $400,000, the final figure was nearly double this - $750,000. The first owner was the firm who built her; in June 1919 she was sold to the France-West India SS Co of New York, then the Franch-American Line of New York; in 1920. Sold for scrap in November 1926, she was gutted at New Orleans and the stripped hull was abandoned on mudflats at that port.

The United States Shipping Board, after Fougner's visit, gave further thought to the question of a Government programme but took no action until 1918 when a separate section was established to look into the possibilities. This section recommended a programme for 1918 to the extent of 560,000 tons deadweight - a target approved by President Wilson on 12th April 1918. This plan naturally called for greater building capacity than was possessed by the existing yards, but the Emergency Fleet Corporation had power to assist financially with the establishment and enlarging of shipyards, and under this power the San Francisco S.B. Co yard was added to, and the following new yards set up:

Fougner Concrete S.B. Co., Flushing, N.Y. - 1 way
Liberty S.B. Co., Brunswick, Ga. - 2 ways
Liberty S.B. Co., Wilmington, N.C. - 2 ways
Pacific Marine Construction Co., San Diego, Calif - 2 ways
A. Bentley & Co., Jacksonville, Fla. - 2 ways
F.T. Ley & Co., Mobile, Ala - 2 ways.

(vii, viii).

In the first instance, contracts for 22 ships were awarded to the following yards (viii) :

Fougner 1, Liberty Wilmington 4, Bentley 4, Liberty Brunswick 1, Ley 4, Pacific Marine 4, and San Francisco 4.

These 22 hulls were to be of 5 types (iii, vii, ix):

CARGO - EFC design no. 1070 - 3590 tons dwt. capacity on 24' draught; 282'2" o.a. (268' b.p.) by 46' by 28'3". Engines - triple expansion, 1520 i.h.p., oil fuel; designed speed 10 1/2 knots.

CARGO - EFC design No. 1100 - 7499 tons dwt. on 26'; 434'3" o.a. (420' b.p.) by 54' by 36'. Engines - triple expansion, 2800 i.h.p., designed speed 10 1/2 knots.

TANKER- EFC design 1101 - identical with design 1100 but internally adapted for the carriage of oil.

CARGO - EXPERIMENTAL - EFC design 1040. 2766 dwt. on 22'6"; 260'2 1/2" o.a. (250' b.p.) by 43'6" by 26'9". Triple expansion engines, 1520 i.h.p., oil fuel, designed speed 10 1/2 knots.

CARGO - EXPERIMENTAL - EFC design 1048. 3347 dwt. on 23'6", 281'9" o.a. (268' b.p.) by 46' by 26'6". Triple expansion engines, 1520 i.h.p. coal fuel, designed speed 10 1/2 knots.

Allocation of contracts was as under:
Fougners - the experimental POLIAS (type 1048)
Liberty Brunswick - the experimental ATLANTUS (type 1040)
Liberty Wilmington - 2 dry cargo of the 3590 tons dwt. type and 2 type 1101 tankers.
Pacific Marine, Bentley and Ley - each 4 tankers of type 1101.

It should be noted here that all types were three-island design, and deck erections were concrete throughout, except that in the designs 1100 and 1101, the poop deck (only) was of wood. It should be mentioned also that between negotiation and signature of the contracts, the 7500 tons dry cargo was eliminated from the first round.

After construction had commenced, further contracts, each for 4 tankers, were allocated to the yards of Bentley, Ley, Pacific Marine and San Francisco.

Thus at its peak, the concrete programme envisaged the building of 38 ships, of a total deadweight capacity of 266,423 tons - quite a difference from the approved 1918 target of 560,000 tons.

Then came the Armistice. Only FAITH, the private effort, had been completed. Considerable re-appraisement of requirements took place, and on 31st March 1919, a report (viii) showed that the 24 tankers of the second programme had been cancelled entirely, while of the other 22 the position was as follows:

ATLANTUS (by Liberty, Brunswick) was fitting out, having been launched on 4.12.1918 - and in fact was the only hull to have entered the water. Eleven were on the stocks and material procurement was well advanced in a further 2 cases. Accordingly, the 8 which were not even near commencement, were cancelled. These were 2 at Liberty Wilmington, 2 at Bentley's, 1 at Ley's, 2 at Pacific Marine, and 1 at San Francisco S.B. Then finally, the two for which material was on hand but which had not been started, were also cancelled, and compensation was paid to the yards.

The final output, therefore, was 14 ships. They were as follows:

EXPERIMENTAL TYPE - POLIAS, O/N 218982. By Fougner, compl. 1919. Wrecked near Rockland, Me., 6.2.1920.

EXPERIMENTAL TYPE - ATLANTUS, O/N 218120. By Liberty Brunswick. Compl. 1918. Converted to a storage hulk 1924.

3590 tons DEADWEIGHT TYPE - all by Liberty Wilmington:

218722 CAPE FEAR - compl. 1919. Sunk in Narragansett Bay 30.10.1920 in collision with CITY OF ATLANTA.

219402 SAPONA - compl. 1919. Dismantled at Miami Beach April 1924.

- OLD NORTH STATE - not completed, but see below.

7499 tons DEADWEIGHT DRY CARGO TYPE: None completed. As so much dry cargo capacity was becoming available in both the steel and the wood programmes, these concrete ships were switched to tanker type.

7445 tons DEADWEIGHT TANKER TYPE: (Builders name in brackets).

220202 CUYAMACA (Pacific Marine) compl. 1920. Converted to oil barge at New Orleans 11.1924. Scrapped 3.1926.

220820 DINSMORE (Bentley) compl. 12.1920. Sold for scrap 4.1932

219772 LATHAM (Ley) compl. 1919. Converted to floating oil storage at New Orleans 11.1924.

220919 MOFFITT (Bentley) compl. 1920. Conv. to barge at New Orleans 12.1924.

220566 PALO ALTO (San Francisco) compl. 1920. Converted to stationary storage at San Francisco 1924, broken up about 1930.

221030 PERALTA (San Francisco) compl. 2.1921. Conv. to tank barge 6.1925. Was still afloat 1946 but subsequent movements not known.

220201 SAN PASQUAL (Pacific Marine) compl. 1920. Sold to Old Time Molasses Co., Havana 1.1925 and converted to floating storage.

219771 SELMA (Ley) compl. 1919. Abandoned as a hulk at Galveston 2.1922

These concrete ships seemed to be born under an unlucky star. Both MOFFITT and DINSMORE had accidents during launching. LATHAM was sold by the Shipping Board in May 1920 to the American Fuel Oil and Transportation Co, but while in floating dock undergoing examination, the dock sank and took LATHAM with her. As a quarrel developed amongst seller, potential buyer, and dockowner, as to who was going to pay the cost of raising both dock and ship, the sale fell through. And finally DURHAM, mentioned below, was delayed in construction by a tornado which flooded the shipyard.

Before passing to a consideration of World War II building, a few further American efforts remain to be noted.

The first was quite a normal vessel, built by the Newport S.B. Co., of Wilmington N.C. I have been told that the firm in question took over the yard formerly operated by Liberty S.B. at the same port, and also took over the work in progress on OLD NORTH STATE, mentioned above. This seems likely but I cannot confirm it. However, the vessel in question was completed in 1921 under the prosaic name of TANKER No. 1, which itself gives support to the theory that the yard was building 'on spec'. Further, the vessel was not registered until 1923, and then as McKITTRICK, O/N 223209, in the name of the Associated Oil Co. of San Francisco. She measured 300' by 44' by 24', and therefore, if she were in fact originally OLD NORTH STATE, some alterations to the original plans must have occurred - though naturally there would be no obligation on the incoming firm to stick to the E.F.C. design. She was powered by one of the triple expansion 188 n.h.p. Nordberg sets left over from the E.F.C. programme. She was converted to a barge in 1932.

The remaining two vessels were oddities. They were oil tankers built by the McDonald Engineering Co. of Aransas Pass, Texas, for the France & Canada Oil Transport Co. of New York. They were constructed in sections, each section consisting of two concrete pipes, 16' in diameter, internally, side by side, and 30 feet high, becoming 30 feet long when assuming their final position. There were 7 such sections, and a normal hull form, with conventional bow and stern, resembling somewhat the turret type of hull, was built round the sections. The fore-and-aft space between the inner keel and the point where the two 'pipes' touched, provided a passage way and pipe trunk. The dimensions of these ships were 298' by 33'9" by 21'. 0". The first built was DURHAM, O/N 221004. Launched sideways on about 1934 and then was presumably scrapped or abandoned. Her twin, DARLINGTON was launched later in 1920, but appears never to have been completed.

REFERENCES.

i Article by Twelvetrees in 'SHIPBUILDER', Vol. 20, p. 18
ii. Ferguson - 'Seagoing and Other Concrete Ships', about 1923
iii. Lloyds Registers 1919 onwards
iv. 'SHIPBUILDER' - various issues 1919 and 1920
v. Fassett - 'Shipbuilding Business in the United States', about 1932
vi. 'FAIRPLAY', 1919-1939
vii. Reports of the United States Shipping Board, 1919 - 1932
viii. Report by Charles Piez to the U.S.S.B. as at 31.3.1919
ix. Article by Wig in "SHIPBUILDER' Vol. 22, p. 180
x. Lloyds Wreck Returns
xi. 'Statistical Summary' by Fisher et.al., U.S.M.C., 1949
xii. 'RECORD' of the American Bureau of Shipping
xiii. Fifth Report of the Select Committee on National Expenditure (U.K. Government, about 1920).
xiv. 'Ships for Victory', by Lane, 1951.