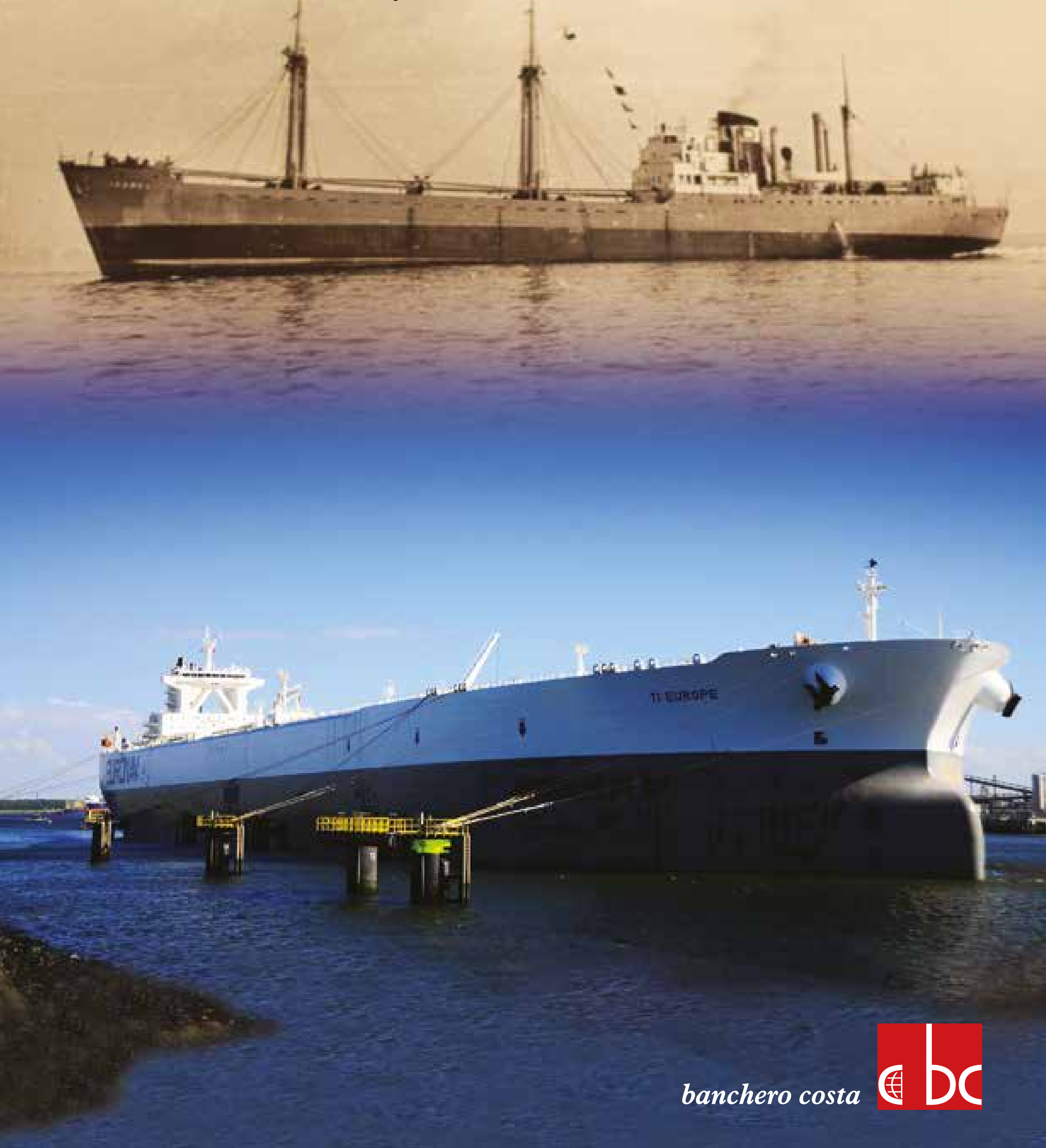
# AN INDUSTRIAL REVOLUTION:

## A Glance Back at Shipping after 69 Years

By Andrew Lansdale




banchero costa

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On an idea by
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Published by *banchero costa*,
Via Pammatone 2,
16122, Genova,
Italy.

Produced by
Andrew Lansdale



Design and layout by Mark Clubb
CarMar Media Limited
www.CarMarMedia.co.uk

Printed and bound by:
Short Run Press Ltd
25 Bittern Road, Sowton Industrial Estate, Exeter, EX2 7LW, UK
Tel: +44 (0)1392 211909
www.shortrunpress.co.uk

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# Foreword

I have always been involved in the shipping industry, or so it seems. After school I was fortunate in being thrown in at the deep end, working passage on a bulk carrier to the Far East. The closure of the Suez Canal turned six weeks into six months and my short adventure in shipping became a lifetime's profession in the dry cargo sector.

**Paul Over, co-founder of Pacific Basin Shipping and Trading**

Dry cargo is a catch-all phrase which covers an enormous number of trades and commodities. There is another book, Thomas' Stowage, which enumerates the many cargoes that are carried by ship from simply anywhere to everywhere. There must be more than 10,000 different cargoes, hitting the heights with gold bullion and plumbing the depths with plain old iron ore. And the whole variety of the dry cargo marketplace and geographical spread makes it the most exciting place in which to be employed in shipping.

I have been a shipowner, a charterer, a broker and an operator based both in the East and in the West. I have never been bored and never lost interest in the nuts and bolts which make up the dry cargo trade.

If I were to leave school tomorrow, perplexed as to whether to follow accountancy, law, commerce, commodity trading or management, I would still target the shipping industry. It embraces all those other disciplines and eclipses them entirely. Additionally, aside from being one of the oldest trades in the world, it is one of almost continuous growth. And it is this aspect, together with the perpetual development and evolution of the industry, on which this book is based.

I applaud Mr Lorenzo Banchero's efforts in organising the plotting of the progress of shipping over the last 69 years. It is undoubtedly the most significant period in the whole history of international trade; from where we were at the end of the Second World War to where we are today. It is an historical work from which we all would benefit:

Bravo!

Paul C Over

# Introduction

Lorenzo Banchero is in his eighties and has been engaged in the shipping industry in Genoa for nearly seventy years. He has commissioned me to write this book to plot the evolution and developments in shipping over that period. This work is not about him, although he has rubbed shoulders with the giants of the industry during his professional career: This is about shipping itself.

Shipping and its supporting layers is the largest industry in the world. At first sight, it is the ships we consider. They have their officers and crews. But these have to be recruited and trained. Thus you have crewing and training establishments. The ship has to trade; therefore there are the professionals all over the world who arrange the ship's employment and others who organise its management.

One also has to look at how the ship came into being in the first place; how it was born. There are numerous naval architects who design ships and shipyards that build them. There are manufacturers who make pumps, winches, cranes, main engines, auxiliaries, ropes, wires, hatchcovers, pipework, radars, navigational instruments, lifeboats and liferafts, marine paints and steering gear, even lifejackets. The list is never-ending.

Throughout its life a ship has to be maintained and drydocked; this sector employs untold numbers of technicians and workers.

The ship visits ports. Here we have tugs, pilots, ship's agents, dockworkers and coastguard personnel. There is the large marine insurance sector as well as the companies that supply stores to ships. The refuelling industry which supplies bunkers to vessels is also very large; some 250 million tonnes of fuel is supplied every year.

And a ship has to be navigated. There are lighthouses and buoys which have to be maintained and serviced as well as built and manufactured in the first place. And these have to be mapped with pinpoint accuracy on charts and the charts printed.

And the most extraordinary thing of all is that the shipping industry is almost invisible. And yet most of the items that are stacked on shelves in shops have been carried on a ship. And 96% of all world trade is carried by sea. It is when one travels to exotic locations such as Corsica, Sardinia or the Greek Islands and one boards a ferry, that shipping emerges from the subconscious.

Also, it is when disaster strikes, such as the grounding and capsizing of the cruise liner , that people are awakened to the fact that shipping actually exists. Otherwise it sits well below the population's radar.

It is not the intention of this book to educate its readers about shipping. It is basically a history book. It does not cover kings and queens, politicians and dictators, battles and wars on which most history books concentrate. What it does cover is ships, thousands of them, plus the period since the Second World War, a time which has seen the most technical innovation and the phenomenal growth in world trade. Let us hope you enjoy it.

Andrew Lansdale, FICS

Wheatleys Eyot, England 2018.

# Chapter One – Prologue

*It is an interesting biological fact that all of us have in our veins the exact same percentage of salt that exists in the ocean, and, therefore, we have salt in our blood, in our sweat, and in our tears. We are tied to the ocean. And when we go back to the sea – whether it is to sail or to watch it – we are going back from whence we came.*

*J.F.K.*

This chapter is entitled Prologue, because it covers the period leading up to the 1950s, or the fifties, when this history session really begins. The Second World War, which occupied the first half of the forties, was a period in which the world was forced to quickly invent and innovate just to survive. And the shipping industry was no exception. It did not stand still. It goes off to a sprint and is still running today

Politicians in the United States of America tried their utmost to avoid being drawn into a European war again. They were prepared to allow their industrial muscle to assist what they perceived as the good guys against the bad. But unrestricted maritime warfare, where innocent civilians serving in the merchant marine were targeted along with the ships in which they served, was leading to the strangulation of trade. British and Russian manufacturing industries were being starved of raw materials and their civilian populations were being starved of food.

But by attacking Pearl Harbour, the Japanese kicked a hornet's nest and that sleeping giant awoke. Where might we be today if that decision had not been taken ?

## Dry cargo ships

So new ships were needed and the requirement was one of extreme urgency. Enter American industrialist Henry J Kaiser. There was a simple and cheap British design, based on the 1939-built *Dorington Court*, designed by J.L. Thompson of Sunderland. Italian shipyards had also produced a similar design, although none were produced. But from this British idea, came the *Liberty* ship. It differed from the *Dorington* in that the accommodation was moved further aft. The British idea that the engineers should be quarantined from the Master and deck officers by a hold and a good length of open deck was not adopted by the Americans. This gave the ship three holds forward of, and two cargo holds abaft, the engine room. Kaiser's seven shipyards expanded the concept of the all-welded, prefabricated way of building a ship, pioneered by the Japanese.

Welding techniques in ship construction had been already in use before the war, but totally welded hulls were viewed with great suspicion. It was the opening of hostilities that gave the necessary impetus to the development of this type of shipbuilding. Welding not only allowed hulls to be lighter, they still remained sufficiently strong. In fact, welded frames and plates, being lighter, could be put together in a much shorter time than traditional methods and speed was an essential element in the concept of mass production. It was a race against time to out build the U-boats.

The bows, the sterns, the cargo sections, the engine room and the accommodation were individually built and fitted out. They were then transported to the building berth in an orderly manner and welded together. Up to this time a ship's plates were generally joined by riveting; a noisy and labour-intensive method. All-welded ships were a new innovation in the West.

**More than 2,700 *Liberty* ships were built**

The seven Kaiser yards were joined by a further eleven shipyards and the mass production of ships continued on an unprecedented scale. Between 1941 and 1945, 2,710 *Liberty* ships were built. The average time taken to build a ship was two weeks. The record was set in November 1942 when the *Robert E Peary* was built in four days and 15½ hours from first steel cutting to sliding down the slipway. Named after an Arctic explorer and Rear-Admiral, there was barely time to organise a Master and crew before she was off to the loading dock.

This piece of propaganda was a signal to the axis powers that America could build ships faster than they were being sunk. The *Peary* survived the war and was decommissioned and placed in reserve in the James River, Virginia in December 1946. She was scrapped in Baltimore in June 1963.

For the technically minded, these ships were about 10,685 tonnes deadweight. They had a length overall of 441ft and a beam of 57ft Their fully-laden draught was 27ft 9in on summer marks. These imperial figures translate to 134.4m x 17.4m x 8.46m. They were powered by triple expansion steam reciprocating engines with steam supplied by two

Scotch boilers. The engines produced 2,500 horsepower (bhp). On a good day, their speed was about 11 knots. They cost $2 million each, the equivalent of $34 million in 2017.

From the *Liberty* design there evolved the slightly larger *Victory* ship, of which more than 500 were built. These were 14ft longer and 6ft wider in the beam, equating to 139m x 19.2m. To provide added protection, they were fitted with 6,500-8,500bhp steam turbine machinery which gave them a cruising speed of 15-17 knots. The fastest U-boats had a surface speed, or 'dash' speed of a similar amount, but by putting the hammer down the submarines could be outrun by *Victories*. By the end of hostilities, 534 had been constructed and delivered.

In Great Britain, the ships were prefixed with the word 'Sam' as in the *Samderwent*. 149 sailed under the British flag.

In addition to the *Liberty* and *Victory* layouts, Canada, the UK and the USA built dry cargo ships with a different design. These were called variously *Forts*, *Parks* and *Oceans*, depending upon their launch names. The main difference in the designs was that these further war-built ships had raised fo'c'sle and poop decks. They had five hatches and holds, but number three hold bisected the accommodation, similar to the *Dorington* design. This maintained the idea that engineers should be separated from the deck officers; 'oil and water don't mix!'

## Oil tankers

To replace oil tankers, the *T2* design tankers were introduced. These were contracted by the US Maritime Commission. These were based on two sister ships, the *Mobilube* and the *Mobilfuel*, which had been built in 1938 and 1939 by Bethlehem Steel. They were of about 15,850 deadweight (dwt) with an overall length of 500ft and a beam of 68ft. The main difference was that the new tankers, called fleet oilers, were fitted with more powerful main engines than the *Mobil* ships. They were built with steam turbo-electric machinery delivering 12,000hp. This gave them a very respectable speed of 16 knots. Nearly 500 of this design were built. There were other variants, details of which can be found in Appendix 13.

**An early *T2* prototype tanker**

Early ships in the series tended to develop cracks in their hulls. Two of them, the *Pendleton* and the *Fort Mercer*, broke in two off Cape Cod within hours of each other. This was initially thought to be as a result of poor welding. The ships averaged 70 days in construction, longer than the *Liberty* ships because of the large numbers of cargo tanks and complex pipework. The record was held by the *Huntingdon Hills* which took only 33 days. It was subsequently held that it was not poor construction techniques that affected the ships, but the steel from which the ships were built; it had too high a sulphur content. This made the metal brittle, especially in low temperatures. The ships were consequently reinforced with steel belts.

**Welding failure on Liberty ships.**
"We placed a ballpeen hammer in the cracked weld and saw it crushed as the ship flexed."

*See Appendix 2*

A similar picture emerged with *Liberty* ships. Of the 2,710 ships built, 1,301 suffered severe hull fractures. Of these, 200 either sank or became constructive total losses.

## Growth of Japan

Japan was an emerging industrial nation after the First World War, but possessed few raw materials. Thus its merchant fleet was an important element in its commercial success. Japanese shipbuilders had already accumulated a great deal of technology since the mid-1920s, even using diesel engines imported from Europe, mainly from the Danish shipbuilder, Burmeister and Wain (B&W). Shipyards concentrated on cargo ships of the 7,000 gross tonnage class, as well as passenger ships of 14,000 gross tons with a speed of 20 knots provided by an engine power of 16,000bhp. This led to larger passenger ships of 28,000 gross tons with 24 knots speed provided by two steam turbine engines of 45,000bhp; So quite a forward-thinking shipping nation.

But, at this time, commercial progress in this direction did not expand as priority was given more and more to naval projects as war clouds were gathering. But this did give shipyards experience in the construction of large warships. These included vessels of such size and power as the battleships *IJN Yamato* and *IJN Musashi*, commissioned in 1941 and 1942 respectively. These were the most powerful battleships ever built with nine 18.1in (46cm) guns in three turrets. The urgency of naval requirements led to pioneering construction methods. This included advanced welding technology and block construction. It also led to the development of high speed tankers built for the navy. One of these, the 1935-built *Tatekawa Maru* of 13,691-dwt, set a new speed record for a merchant ship of 20½ knots in a laden condition.

**Japanese mega-battleship *Yamato*, built with very advanced welding techniques**

After September 1945, the US administration took over Japan. This included all transport. This was mainly seaborne since the inland infrastructure was in chaos. The first priority was repatriating more than four million of Japan's armed forces deployed overseas from Burma to the South Pacific.

The US merchant marine also handled the country's imports and exports until 1948. The first cargoes were then allowed to be carried on Japanese-flagged ships, the initial voyage being a tanker full of oil from Bahrain.

Japan was allowed to revitalise its merchant fleet in 1947 under the Planned Shipbuilding scheme (Keikaku Kenzo). It established the Ship Public Corporation (Senpaku Kodan) which held joint ownership of newbuildings with shipowners. This forced Japanese shipyards to concentrate on ships aimed at domestic and cabotage trades. This arrangement came to an end in 1950.

At first the country relied on a fleet of 129 ships, repaired and made operational after war damage. The occupying power then allowed the construction of 112 vessels ordered during the war and amounting to 380,000 gross tons.

In 1949, General Headquarters (GHQ) permitted ships of 800 gross tons or smaller to be managed by the private sector. The size limit was gradually increased until, in 1950, all Japanese ships were allowed to trade freely.

The re-establishment of the Japanese merchant service had become a priority after the war. Wartime casualties amounted to more than 93% of the pre-war merchant fleet, some 8.5 million gross tons. The remaining fleet amounted to less sophisticated war-built ships. By 1953, the annual tonne-mile carriage figures had risen to 30% above pre-war levels.

But after some time, shipyards looked further afield and started to attract overseas orders. This included tankers of about 18,000-dwt for Scandinavian owners. Success bred success and Japanese yards attracted more and more orders. This was funded by the Development Bank of Japan which had been established in 1951. And world events forced a huge upward's shift in export orders.

The Arab-Israeli war of 1948 caused a lack of confidence in the future security of the Suez Canal. Trade moved away from the Mediterranean and ships took longer passages around the Cape of Good Hope. This led to a greater demand for new tonnage. By now Japanese technology allowed for the production of fully-welded ships, free from brittle cracks and breakdown in welds. The Planned Building policy was then extended to oceangoing ships, and the country's deep sea fleets grew quickly. The Korean War, which started on June 25th 1950, prompted an increased demand for merchant ships and Japanese shipbuilding thrived.

In the West, when the world was getting back to normal, the war-built *Liberties*, *Victories* and *T2*s were vital for the re-birth of global trade. Many were sold by governments which operated them, mainly the USA, Canada and the United Kingdom, into private ownership. These included companies from Greece, Italy France, Belgium, Holland and the UK. However, in the case of the *T2* it was the US owners that benefitted most. About two-thirds of this tanker fleet was sold off by the US Maritime Commission and only 30% of the sales were for foreign flags. Included in this percentage were the sales to European subsidiaries of the US oil Majors such as Esso, Mobil and Texaco.

Those not sold abroad were place under the care of the US Maritime Administration (MARAD) and kept at various anchorages as a reserve fleet. At one time more than 2,700 were held at James River, Virginia, Beaumont, Texas and Suisan Bay California.

Of the ones that had been sold off, ships that had been designed to last for a single transatlantic voyage, and with the hope that they would trade for at least six months and perhaps as long as five years, survived for far longer. Some traded for more than 30 years.

And so it was with a large number of such ships, plus the post-war European and Japanese fleets, that peacetime trade was restarted. This was the hardware that owners had available to them at the start of the 1950s. And pretty basic and primitive they looked when compared with modern tonnage. But they served a vital purpose. They and their crews courageously assisted in bringing this world back to some sort of normality. And they did it well.

**Fire in the hold!**
Liberty ships catching fire

*See Appendix 3*

World trade, which had been geared to wartime production, now had to get used to peacetime conditions. Ships had always been used to move goods and materials from one place or country to another. Usually the cargoes were moved from a country which had a surfeit of production to countries where the demand was significant. For instance, Japan had few raw materials and therefore imported cargoes such as iron ore, coal and other things that go into manufacturing processes. It then exported its surplus production. And that, of course, was the basis of world trade. And it also involved people.

Passenger ships were used to transport human cargoes, in the days when few people were moved in aeroplanes. After the carnage of the world wars, many families sought a better standard of living as was available in North America, South Africa and Australasia. Thus many ships were engaged in one-way human trafficking.

Large oil companies such as Esso and Mobil developed crude oil resources in Saudi Arabia. But instead of building oil refineries close to production areas, they built them close to where demand for refined products existed. This ensured that oil companies relied mainly on crude oil from the Middle East. Thus refineries were built all around the US, Japanese and European coasts. Small product tankers were then used to transport refined products to smaller ports.

And then came the fifties.

# Chapter Two – The Fifties

More than 2,400 *Liberty* ships survived the war. Of these, more than 525 were sold to Greek buyers. More than 125 went to Italian owners, a sufficient number of ships which, end-to-end, would have stretched from Genoa to La Spezia. War-built ships purchased by European shipping companies varied in price from $50,000 to $250,000. This was a generous gesture by the USA and was part of the Marshall Plan. As mentioned in the previous chapter, these ships cost $2 million to build. A reduction of 90-95% in price was a significant drop. But it was also a way to get world trade moving again.

With its high cost base in running fleets of merchant ships, the USA would have found it impossible to accomplish this on its own. Its mercantile marine officers and crews were highly paid. They were world-renowned for having large amounts of dollars clinking in their trouser pockets when they came ashore.

In fact high labour costs caused the US Merchant Marine to dwindle in size to that of a coastal fleet on cabotage runs.

A *Liberty* ship was caught in a storm and the cargo of wheels from railway wagons broke loose and rolled around the hold, threatening to break open the hull plating. To read how the crew overcame this fatal threat.

*See Appendix 1*

In the beginning, *Liberty* ships were shipowners' daily bread. The first of this type to arrive in Italy was the *Montello* of the Compagnia Navigazione Alta Italia company, owned by the Piaggio family, whose offices were in the centre of Genoa, Italy's shipping hub. During the 1950s and 1960s, in the dry bulk sector alone, there were numerous shipowners operating throughout the city. Notable names at that time included Febo Amedeo Bertorello and Andrea Corrado. It is estimated that there were 48 dry cargo companies and 18 tanker owners. In the 21st century this number has shrunk to only four or five.

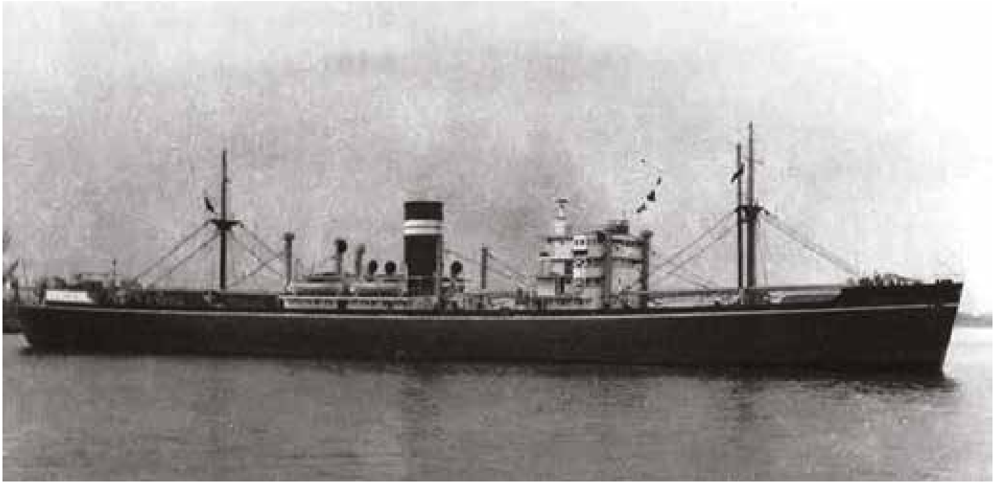
During the fifties, Italians, Genoese included, were extremely active in the shipping market. Senator Bibolini, a *Liberty*-ship owner, was perhaps the first in the world to place orders in Italian shipyards. These were for 16,000-dwt bulk carriers which became known as Bibolini-type vessels. This class and design of ship, a self-trimming bulker, has continued to operate basically unchanged in the dry bulk sector; as they evolved, they just got bigger. Senator Bibolini had a significant effect on Italian shipping. He bequeathed ships to family members. After his death, one of his nieces married a certain Glauco Lolli-Ghetti, bringing her ships into the marital union. Setting out on his professional career, he trained as a pharmacist. But when the family became shipowners, he grasped the opportunity eagerly; a good man to have beside you when you have a hangover. The Lolli-Ghetti shipowning name became famous worldwide.

## Trades

Typical trades were phosphates from the Red Sea and North Africa to North Europe and coal from Northern Europe to Italy. This assisted in the expansion of farming and the fuelling of a reborn industrial base.

Others carried coal from Hampton Roads on the US East Coast to Europe and the Mediterranean. Iron ore was transported from West Africa to the USA to feed the country's huge appetite for steel. Cuba was one of the world's largest sugar producers and this trade out of Havana was another large portion of 1950s' trade.

In Russia, Stalin's misrule led to grain harvest failures and approaching famine. Therefore huge amounts of grain were imported by the Soviet Union from South America, Australia and Canada. Other routes were also developed; many liner trades were served by war-built dry cargo ships by famous corporate names of the past such as Clan Line, Ellermans, Blue Star, Stricks and Royal Mail Lines. Other European ownerships included Grimaldi Brothers, Messageries Maritime, Compagnie Maritime Belge and Holland-Amerika Linie. Owners such as Giovanni Bottiglieri did not get involved in such liner trades. They concentrated on tramp trades which took their ships worldwide.



**British India's *Ordia* and her sister ship, *Olinda*, were based on pre-war creations**

Subsidiary companies under the P&O umbrella quickly placed orders with British shipyards for replacement tonnage. Many of these were initially based on pre-war designs. British India (BI) purposely ordered ships with steam reciprocating triple-expansion main machinery with high-pressure steam supplied by Scotch boilers. They had coal bunkers under the accommodation along the tweendeck level either side of the engine room. The owners owned coal mines in India for supplies of cheap fuel. The ships also had fuel oil tanks and were fitted with all the necessary pumps, heaters, separators and strainers required for the oil to be burnt under the boilers. These were therefore the first dual-fuel ships. By the end of the fifties, these ships only ran on fuel oil. They could be recognised from many miles away by the black smoke they emitted.

## Bulk trades

Iron ore was mainly transported from South America and West Africa to the USA. The country had a huge appetite in the steelmaking industry. The roots of such trades were ideas developed in the early 1920s by Bethlehem Steel. It took advantage of the newly-opened Panama Canal and sourced its raw material from both the East and West coasts of South America. It built the Sparrow's Point (Baltimore) steel plant designed to import iron ore with two 22,000-dwt ore carriers, at that time the largest ocean-going cargo ships.

In the 1950s in Western Europe there was also a huge appetite for steel, but it was largely produced with supplies of local iron ore and coal. But this was not the case for Italy. It had little domestic raw material and followed Bethlehem Steel's path. In order to produce high-quality at a reasonable price it purchased feedstock from overseas and built plants with a high output capability. Once the Second World War was over, these projects were resumed and Italy built a few large coastal steel plants located in major ports such as Genoa and Bagnoli, near Naples. The last and largest, which entered service in 1961, was at Taranto. The country's seaborne imports of iron ore and coking coal grew constantly in the 1950s.

## Fuels

In the 1950s, bunker fuel was cheap compared with current prices. Crude oil hovered around $2 per barrel in the 1950s and fuel oil was always sold at a lower price than this. Fuel oil was the very dregs of the crude oil barrel and was in little demand for anything other than for propelling ships around the world.

Therefore it was a rather small percentage of a ship's running costs. Shipowners looked more for speed than for economy. This is where steam turbine machinery came to the fore. From the average speed of 10 knots for the wartime and immediately post-war-built ships, turbine-powered vessels raised speeds in the fifties to more than 17 knots. This offered the cargo owners the opportunity to deliver their goods to other parts of the world far sooner than their competitors; express delivery services.

To compare the speed of container ships with a war-built *Liberty* ship, go to *Appendix 6 and 7*.

For those that did not need their goods delivered with such speed, they preferred ships which were fitted with marine diesel engines. These ships consumed the same amount of fuel as their predecessor triple-expansion-powered ships, but had a 5-knot speed advantage for a similar fuel consumption figure: Not fast enough to water-ski behind, but significant enough. Freight rates could be discounted as a result of this slight economy.

And at sea, diesel engines used the same heavy fuel oil as their steam-powered rivals, but with a lot less smoke.

It had taken a few years before these more modern, diesel-powered vessels were built and delivered. European companies such as Port Line, Messageries Maritime, Royal Rotterdam Lloyd, Blue Star Line and Lloyd Triestino all commissioned good-looking, streamlined cargo liners. These graceful vessels were constructed in rebuilt shipyards destroyed in the war. Italian yards led the way in building ships with extremely elegant lines. These all traded to colonial ports in South America, Africa and the Far East. Passenger vessels were built to perform trans-oceanic voyages that had flourished in pre-war periods.

**One of the most elegant of ocean liners, the Italian-flag, *Cristoforo Colombo* sailed on her maiden voyage from Genoa in 1954**

In addition, and when trade volumes were thin, cargo vessels were chartered out by their owners. So it was not unusual to see a vessel, perhaps owned by Hamburg-South America Line (Hamburg Südamerikanische Dampfshifffahrts Ges.) trading to Australia or to Japan.

In the early1950s, cargo owners shaped their goods to fit the ships which carried them. Packages, boxes, crates and other bindings were designed to allow stevedores, longshoremen or 'wharfies' as they were variously called, to safely move them around the holds without straining themselves. Bags of commodities, such as rice, grain and high-value mineral ores were placed in jute or hemp bags that weighed no more than a hundredweight or 50 kilos. In other words, the shape of the ships dictated the cargoes they carried.

## Birth of bulk carriers

Gradually, cargo owners started to demand other designs. Instead of a generic tweendecker, ships with large holds and no tweendecks were built. These were described as bulk carriers. They carried iron ore, coal, grain, steel and scrap metal in bulk, and generally for one cargo owner and one consignee. It was also recognised that economies of scale could be brought to bear.

For those who are bored by statistics, you can skip the next three paragraphs! World crude steel production in 1937 totalled some 150 million tonnes. This was at a time when the future combatants were gearing up for war and busy re-arming. But by the end of the 1950s, this had grown to 350 million tonnes as infrastructures were rebuilt. This demand for iron ore increased demand for bulk carriers where, by the end of the decade, the world fleet reached 5 million tonnes deadweight carrying 90 million tonnes of cargo per year.

Thus ships grew larger, limited only in size by existing port and terminal restrictions. During the fifties these ships grew from 10-12,000-dwt to as large as 20,000-dwt by 1959. These vessels were mainly involved in trades between the USA, Europe and Japan and by 1959 were carrying 46.2 million tonnes of bulk cargoes annually. During the 1950s, the Japanese economy grew at a rate of almost 11% per annum and attracted world trade like a magnet. As an example, its share of the export of heavy chemical industry products was about 3.9% of the world total. By the end of the decade, this had increased to more than 50%, forcing world fleets to grow to cover this increase in seaborne trade.

The tonne-mile calculation amounted to 145 billion tonne-miles, meaning that the average voyage length was more than 3,200 nautical miles (nm). For comparison purposes, the sea distance between West Africa and the East Coast of the USA is a similar distance.

## Growth of oil tankers

In the fifties, oil was another cargo that increased in volume. World oil production amounted to about 4 billion barrels per year in 1950. By 1960, this had increased to about 7.5 billion barrels. In the same fashion and in a similar timeframe, seaborne trade in oil increased at roughly the same pace. It became apparent that oil was a much easier commodity to handle than coal and the future for power generation was oil rather than coal.

Although T2 tankers took the burden of oil shipments at the beginning of the fifties, increased demand as the decade progressed required more tonnage. The success of war-built tankers provided a good template on which to base new ship designs. And there was a great number of newbuildings being contracted. For example, British Petroleum, now BP, built 95 ships in the fifties. The company started with the 1950-built *British Reliance* of 15,875-dwt, the same size as the T2s which it was built to augment. The last one was the *British Queen* of 54,329-dwt which was launched at John Brown's on Clydebank, by Queen Elizabeth ll in September 1959 and which was three times the size of the *Reliance*.

And this was just British Petroleum. As well as this oil company, there was Shell which usually ran a large fleet, traditionally half as large again as BP. Esso competed with Shell in fleet size. Oil companies were a conservative bunch in this decade. But Greek and other countries' shipowners were bolder. They could see how the land was lying, that ships were getting larger and they were determined to take the lead in this trend and then some.

The largest tanker afloat in 1959 was huge in terms of its competitors. It was Daniel K

Ludwig's *Universe Apollo* of 104,520-dwt, and capable of loading six times the cargo of more traditional oil tankers. And when loadline rules changed, it was capable of loading a further 20,000 tonnes of cargo. The American owner, who was born in 1897 and died in 1992, was a trendsetter and pioneered considerably larger ships than existing ones. In 1950, he built the *Bulktrader* of 30,004-dwt when most owners were building tankers half its size. In the early 1950s, he leased the Japanese shipyard in Kure which had built the giant Japanese battleship *IJN Yamato*. The first ship that was floated off its building blocks was the 1952-built *Petrokure* of 38,021-dwt. The *Universe Apollo*, three times its size, was delivered from the same yard in 1958.

**The largest ship in her time, the 1959-built, 104,000dwt *Universe Apollo***

Although the major oil companies bought a great number of ships, it was not enough to satisfy world demand for deliveries of oil. Thus independent shipowners took advantage of this vacuum and placed numerous orders around the world. The split that oil companies usually adopted was in thirds. One third was oil-company-owned; a third was from independent shipowners and tied into long-term timecharters. The final third was taken for voyage charters, either for single voyages or for a certain number of consecutive voyages.

The increase in tanker demand was unable to be met by existing European shipyards. After Daniel Ludwig's success in Japan, the attention of shipowners was even more drawn towards the East and size mattered.

Ludwig's venture led to the advancement of the modern block construction and tanker fleets quickly grew in size. In support of Japanese maritime industry companies, taxation laws allowed favourable depreciation of ships where a substantial amount was allowed to be written off in the first year. Similar favourable schemes were made available to the shipbuilding industry as well. In 1952, Japan's Export/Import Bank, a subsidiary of the

Development Bank of Japan, was established and when newbuilding volumes reached their peak, shipbuilding exports recorded an 80% share of all exports handled by the Exim Bank.

By 1954, reliance on hydrocarbons as an energy source was promoted and this developed the concept of dedicated designs where the ease of handling cargoes such as coal was a priority. It was here that the first dedicated bulk carrier was built. Before then, bulk cargoes had been loaded onto general cargo ships. But this was the turning point and a new class of ship was born.

## War again

Tension between countries in the Middle East, which had affected Suez in the previous decade, affecting world trade, boiled over again in 1956. Israel attacked Egypt. This resulted in the Suez Canal being blocked with sunken ships. It remained closed to navigation for five months. The average size of tanker in the run-up to the conflict was about 43,000-dwt. Following the outbreak of hostilities, orders were placed for ships with an increased deadweight of more than 60,000-tonnes. This was to ensure similar profitability, despite the much longer route via the Cape of Good Hope which had been forced on shipowners. It was at this time that Japan became the world's largest shipbuilding nation.

**The Suez Canal blocked by scuttled ships**

Having been owned by the British and French governments almost since it was built, the Suez Canal was nationalised by the Egyptians at this time, led by its president, Gamal Abdel Nasser. The canal pilots were mainly drawn from European Master Mariners. These were all withdrawn when the canal was blocked in 1956. When the canal was reopened, the Suez Canal Authority drew pilots from all over the world. And much to the surprise of the British and French, whose sense of superiority had lingered since colonial times, the canal worked rather well under Egyptian management.

Since the early fifties, there had been an accelerating move away from steam turbine machinery and on to more economical marine diesel engines. Turbines tended to be reserved for ships with higher speed requirements, such as express liner services, and for extremely large ships where powerful enough diesels had yet to be developed; diesel engines were supplied for the rest.

One exception was the experiment with nuclear fuel. The Russians were the first to power a civilian ship using nuclear fission. This was a large icebreaker named the Lenin. The ship could stay on duty in the Arctic oceans for years without refuelling. This was the first ship apart from naval vessels to be so equipped.

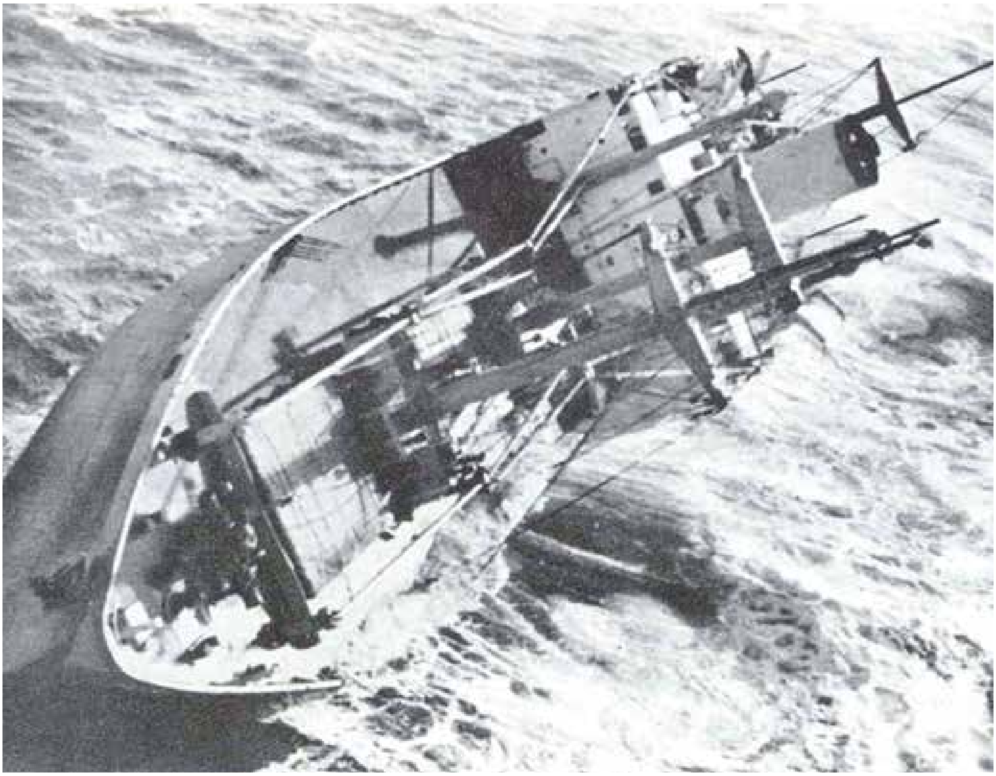
## Maritime heroics

In the 1950s, shipping was more visible than it is today. Ships were small enough to navigate right up to city centres. People were educated about shipping. They could tell the difference between a dry cargo ship and a tanker. Some could even name the companies that owned a ship by a ship's livery, its hull colour and funnel markings. Therefore, the case of the cargo ship *Flying Enterprise* stirred many hearts and created a huge amount of interest. The war-built vessel was owned by the US Company, American Export-Isbrandtsen Lines, and traded across the North Atlantic.

On 21st December 1951, the *Flying Enterprise* sailed from Hamburg under the command of Captain Henrik Kurt Carlsen, bound for New York. It had a general cargo comprising pig iron, VW cars, peat moss, antiques, naphthalene, typewriters and some valuable metals. It also carried ten passengers.

On Christmas night, it ran into a storm in the Western Approaches to the English Channel. This was judged to be the strongest storm for 50 years with 20 metre waves and 100-knot winds. The ship suffered some structural damage which included cracks in the weather deck; the cargo also shifted. It was hove to for a couple of days, during which time more of the cargo shifted and the ship developed a list of some 45°. The Master put out an SOS on the 28th December. Two ships, the *Southland* and the US warship, *USS General A W Greely* came to its aid.

On 29th December, the crew and passengers were taken off. Sadly, one of the passengers, a Mr Nicolai Bunjakowski, drowned during this exercise. Captain Carlsen remained on board. The two attendant ships were relieved on station by the warship *USS John W Weeks* on the 2nd January 1952. On the 3rd January, the British tug *Turmoil* arrived, guided by the warship's searchlights. The weather was still bad and it was found impossible to take the *Flying Enterprise* under tow. The First Mate of the *Turmoil*, Kenneth Dancy, transferred to the stricken ship the next day; its list had now increased to 60°. It is difficult to imagine how the two men moved around the ship on such sloping decks. On the 5th January, a towline was passed to the ship and the tow began.



**The *SS Flying Enterprise* shortly before she sank**

On the 6th January the *USS Willard Keith* relieved the *John W Weeks* and was joined by the French tug Abeille 25. In the early hours of the 10th January the towline parted. Later that day the salvage efforts were joined by the tugs *Englishman* and *Dexterous* and the Trinity House lighthouse tender *Satellite*. But the *Flying Enterprise* was getting low in the water and the list was increasing. At 1522, the ship was practically on its beam ends and the order was given by Captain Carlsen to abandon ship. He and Dancy were taken aboard the *Turmoil*. *Flying Enterprise* sank 40 minutes later.

The salvage attempts caught the public imagination in Great Britain, Europe and in the USA. Television was in its infancy, but the *Flying Enterprise* got wide coverage both on BBC wireless programmes and on Pathé News in cinemas. The *Turmoil*, with Carlsen and Dancy on board, arrived in Falmouth to a huge welcome from ships, from boats and from people onshore.

For their gallant conduct, Captain Carlsen was awarded a Lloyd's Silver Medal for Meritorious Service and, on his arrival in New York later in January, received a ticker-tape parade. Kenneth Dancy was awarded a medal for Industrial Heroism by the newspaper, Daily Herald, and an Illuminated Citation by the American Institute of Marine underwriters.

*Liberty* ship life-saving equipment condemned.

*See Appendix 4*.

So famous was the episode that the British newspaper, the Daily Express, offered Danish-born Captain Carlsen £100,000 for his story and Hollywood offered half a million dollars. He declined all offers. “I don’t want a seaman’s honest attempt to save his ship used for any commercial purposes,” he announced. He was rewarded later in 1952 with the captaincy of the *Flying Enterprise 11*.

This ship was called up on the Morse lamp in the middle of an Atlantic night. “What ship?” it blinked out. “*Flying Enterprise 11*,” came the response. Then the night sky was lit up as the huge transatlantic liner *RMS Queen Elizabeth*, the largest passenger ship in the world, saluted the ship and its master by turning on the spotlights that illuminated its two huge red and black funnels.

For his heroism, Captain Carlsen was also awarded the Merchant Marine Distinguished Service Award, authorised by a special act of Congress in Washington.

Captain Carlsen was also honoured by the monarch of his country of birth, King Frederick lX of Denmark.

American writer, Abraham Rabinovich, interviewed the sea captain in the early 1960s. He finished his article like this:

> ‘In our conversation, he appeared bemused by all the fuss made over him but he had come to realise, he said, that his adventure had attained a symbolism that mattered.’
>
> “I would like to believe that the youth of America, and the world, had learned a lesson.”
>
> “What lesson?”
>
> Thinking for a moment, he said, “To do what you’re supposed to do.” Nodding his head, he repeated, “To do what you are supposed to do.”
>
> Thus spake the ancient mariner!

Carlsen retired from the sea in 1976 and died in October 1989. At his own request, he was buried at sea close to the wreck of the *Flying Enterprise* on the 8th February 1990.

Kenneth Dancy died on the 3rd August 2013, aged 88 years.

## Japan ups the pace

In 1955, the Japanese government decided upon a 'self-reliant economic five-year plan'. The arrangement was not to rely on growth in the USA to trigger growth in Japan. The country was to become economically independent with a corresponding rise in employment. In the shipping sector, annual transport volumes would increase to a target figure of 30.7 million tonnes. This would require a newbuilding construction figure amounting to 1.26 million gross tons.

The plan was a huge success with targets achieved halfway through the five-year period. Therefore a new target was set. In the second half of 1957, the newbuilding figure was changed to half a million tons gross tonnage (gt) annually, including replacement tonnage. The government did not want the sector to overheat. But the closure of the Suez Canal encouraged a host of newbuilding orders to be placed. The next decade saw an even bigger increase and this is covered in *Chapter Three*.

Of course, Japanese shipping was regulated by the GHQ, the American watchdog on Japanese trade efforts. The revision of the International convention for the Safety of Life at Sea (SOLAS) in 1948 had led to compliance by all Japanese ships. This had required a change in Japanese law and included an inspection regime. When the GHQ relinquished its grip on Japan, the maritime classification society, Nippon Kaiji Kyokai (NK), was able to raise its head above the parapet and stand on its own.

## The rise of Liberia and Panama

At the beginning of the 1950s, merchant ships mainly flew the flag of the country where they were owned. Thus the US fleet was large and its seafarers generously paid compared with other large fleets in the world. American owners started to flag their vessels abroad in countries such as Panama and Liberia to save money. This move involved a less onerous salary bill, wage and tax regime; cheaper crewing arrangements made the ships more competitive and thus led to greater profits.

**The Panama flag fleet amounts to nearly 25% of the world's deadweight**

Shipowners in other countries saw the possibilities for some of their own ships and the development of the 'flag of convenience' (FOC) began. At the end of the 1940s, the FOC's fleet amounted to 3 million gross tons. By 1959, this had increased to 16.7 million gross tons.

Apprentices working cargo aboard a *Liberty* ship in the 1950s gave them valuable experience brought forward to more modern ships.

*See Appendix 5*

## Emergence of tanker brokers

It was at this time that shipbroking houses had to rethink how their companies were composed. Until this time, apart from liner trades, every type of shipping had been arranged or 'fixed' on London's Baltic Exchange. Shipowners' representatives and the employees of merchants visited the floor of the Exchange and mixed with shipbrokers. The merchants revealed their cargoes and the owners their ships' positions. The shipbrokers negotiated and arranged charters for the ships and the trades were sealed.

This initially occurred with oil trades, but as the tanker fleets expanded and oil trades grew, shipbroking companies opened up tanker departments. Tanker brokers found it time-consuming and overly formal to visit the floor of the Exchange every day and negotiations were carried out over telephones or by cable. At that time, overseas calls had to be booked through a Post Office operator, but it took more than a day to get connected. Cables were much more reliable and clerks were employed to code up the messages using the New Boë Code. This was a 1,000-page book, developed by Conrad Boë in Oslo and containing some 370,000 five-letter codes decoded into the same number of English phrases. An example is 'NKAWW' which decodes into 'What can you offer?' Cables were sent by Morse code and charged by the number of characters. The above example would be charged at five characters instead of 15. The Boë Code was phased out in the late 1950s when teleprinters or telexes were introduced.

Compared with dry cargo, tanker brokers worked in their own way with charter parties being developed in conjunction with oil companies. Voyage charter parties such as Shellvoy, BPvoy, Essovoy and Mobilvoy gives us a clue as to the oil companies behind them. Timecharter parties such as BPtime and Shelltime were drawn up in a similar fashion. Oil traders did not exist and the main cargo principals were the major oil companies. These comprised Shell, British Petroleum, Texaco, Gulf Oil, Chevron, Esso and Mobil. They were given the name 'the seven sisters' by Enrico Mattei, the head of the Italian state oil company, Ente Nazionale Idrocarburi (ENI), when describing the 85% domination that these companies held over global oil.

These oil majors had their own tanker fleets and often carried each other's cargoes. They needed to invoice each other for such cargo movements, but were unsure of how much to charge. London tanker brokers came galloping to the rescue and established the London Tanker Brokers Panel in 1953. It comprised H Clarkson and Co, Galbraith Pembroke and Co, E A Gibson and Ferguson Wild and Co, SLA Ltd., Simpson, Spence and Young


Intertanko's book explaining Worldscale

and Partners, Harrison Dixon and Co, Howard Houlder and Partners, and Davies and Newman and Co. (Only half of these companies survive today).

The oil companies would provide the cargo size, the voyage and the date of loading and the panel would make an assessment of the freight rate. The panel still exists today and, as an additional service, provides to subscribers on a monthly basis its Average Freight Rate Assessment or AFRA on various voyages and sizes.

## Rate schedules

Tanker freight rates were also different from dry cargo earnings. The latter were based on a US dollar or GB pound per ton from port A to port B, or on a dollar or pound per day timecharter rate for a specified period. Tankers had to have a different system. If a tanker was fixed from 'one or two safe ports Persian Gulf', the choice of loading ports is large; as many as 15 major terminals.

Then if the discharge range was 'one or two safe ports European Mediterranean, and/or one or two safe ports UK Continent, Gibraltar Hamburg range, or one or two safe ports US East coast, north of Cape Hatteras, and/or one or two safe ports US Gulf' the number of permutations is almost beyond measure. Each potential voyage would have to be separately negotiated and one must remember the 'one or two' ports option which sent another huge number of permutations into the mix.

The British government was faced with a similar difficulty in the Second World War. Its Ministry of War Transport (MOWT) solved the problem with a publication called a freight rate schedule. Freight rates were determined in accordance with a scale or schedule laid down by the MOWT. The rates were calculated so that, after allowing for round voyage distances, ports costs, bunker prices and canal charges, the net daily revenue was the same, whichever voyage was performed.

The last wartime schedule was published by the British government in January 1946 and was known as MOT. Similar rates were issued by the US Maritime Commission and became known as USMC. These schedules were used until the early 1950s with the flat rate which had a plus or minus percentage applied to it depending on market conditions. So it could be MOT plus, say, 50% if the market was good or MOT minus, say, 25% if the market was poor. They were superseded in the early 1950s by other scales such as Intascale and the American Tanker Rate Schedule (ATRS).

## The Greek invasion

During the 1950s, London was where the majority of world seaborne trade was conducted. Some shipowners who wanted to be close to the epicentre decided to open offices in London. Some, including scores of Greek owners, moved themselves physically to London. They sometimes attended the Baltic Exchange with their chartering clerks and fixed their ships, or gave their clerks authority to conclude business at prescribed terms and conditions on their behalf.

Companies such as C M Lemos, Lyras Brothers, Rethymnis and Kulukundis, as well as George Livanos and John Carras, were established. Carras bought the 1944-built Liberty ship Frank J Cuhel, which he renamed Fotini after his daughter. It is also reported that he never borrowed money to buy ships, he always paid cash. One day his in-house chartering broker came to see him; he was negotiating the long-term charter of a Carras ship.

"The charterers are talking about bank guarantees," the broker reported.

"What bank do they want me to guarantee?" was Mr Carras' response.

For a personal view of Greek shipowners, go to *Appendix 12* and read Spyros Polemis' take on this unique breed of shipping adventurers.

Shipowners behave in eccentric ways sometimes. Stavros Niarchos bought a series of bulk carriers from a Greek shipyard. They were of poor design with a deep draught and poor cubic capacity. Niarchos was asked why he had ordered them.

"Because they were cheap," was his response.

Hong Kong shipowner George Chau sold one of his ships on a rising market. Asked why he hadn't waited until the market had reached its peak, he said, "Let somebody else earn the final ten percent."

## Elegant giants

One sector which was large and important in this decade was that of passenger liners. Each maritime nation had a ship in which was instilled national pride. In the case of the USA, it was the transatlantic liner the *SS United States*. In France, the *SS Normandie* was revered. Italy was proud of the elegant *Cristoforo Colombo*. Great Britain had the 'Queens', the *RMS Queen Mary* and the *RMS Queen Elizabeth*.

In Italy, pride of place was given to the *SS Andrea Doria*, named after a Genoese Admiral. It was owned by Italia Società di Navigazione, or the Italian Line. Designed by the famous Italian architect Minoletti, many praised it for being the most beautiful passenger ship ever built.

**One of the elegant transatlantic liners**

But it became infamous because of its demise rather than for its life. Three and a half years after its maiden voyage it was involved in a collision with the Swedish liner *MS Stockholm*. With a passenger capacity of 1,200 and a crew of 500, the Italian icon was evacuated, but not without cost; 46 passengers died. Blame was placed with the Italian officers and crew. This was largely because if a ship is in collision with another ship and is struck on its starboard side, as the *Andrea Doria* was, it should have manoeuvred away to avoid such a collision.

There is that famous rhyme which deck officers use to remind themselves of their priorities:

If to your starboard, red appear,
It is your duty to keep clear,
To act in judgement right and proper,
Turn to starboard, back or stop her.

The ‘red’ in the first line refers to the portside navigation light which is red in colour, whereas the starboard light is green.

Also, the *Andrea Doria* was in fog and in reduced visibility: According to international rules, it should have proceeded at a much reduced speed. But it was still travelling at more than 20 knots when the collision occurred.

Subsequent investigations have suggested that greater blame should have been apportioned to the Swedish ship. Its watchkeepers failed to interpret the radar readings correctly, leading both ships to change direction onto the fatal final course.

Three years earlier, another infamous collision between passenger ships took place. The two culprits were Dutch. The first was the *SS Oranje*, owned by Nederlandsche Stoomvaart Maatschappij or Netherland Line. The other was the *SS Willem Ruys*, owned by Royal Rotterdam Lloyd. Both ships were employed between the Netherlands and its colonies in the East Indies. In January 1953, both ships were in the Red Sea. The *Oranje* was heading for the capital of Indonesia, Djakarta, while the *Willem Ruys* was going home to

Amsterdam. In order to give the passengers a thrill, both ships, with a closing speed of more than 40 knots, attempted to pass each other as close as possible.

In the event, the *Willem Ruys* altered course unexpectedly and was hit by the *Oranje*. Both ships suffered severe damage, but were able to continue on passage. No injuries to passengers or crew were reported. In the 1960s, the *Oranje* changed hands and became the *Angelina Lauro*. In the same year, the *Willem Ruys* became the *Achille Lauro*, a name which will live forever in infamy and in the annals of maritime terrorism and of which more later.

## Conclusion

The fifties represented a return from hostility-structured economies fashioned by the Second World War and the Korean War. These wars caused impoverishment for many millions of people. The years following a return from a war-footing represented a slow build-up of people's assets and country's infrastructures. World trade had faced many obstacles such as minefields, submarine warfare and commerce raiders. The main challenge was to restore shipping lanes, ports and the ships themselves.

The fortunate aspect which hastened the development process was the unexpected longevity of war-built ships. Many lasted into the 1960s when they were only expected to last for six months or so. We have already covered the design particulars which made these ships most unsuitable for many trades. It was only the fortitude of many thousands of sailors from numerous nations that overcame the extreme conditions endured on these vessels.

> *Liberty* ships were built for comparatively short voyages. Read how crews existed on a daily ration of one bucket of water between three people on longer voyages in *Appendix 8*.

The fifties saw changes in world trade as larger ships were brought into service, mainly in tanker trades. Political events such as the closure and then the reopening of the Suez Canal created huge swings in freight rates. These events triggered a move towards much larger ships. In this decade tankers increased in size from 16,000-dwt to 104,000-dwt.

In the dry cargo sector, bulk carriers were introduced and their sizes gradually increased as shore facilities and port infrastructures were enlarged to accommodate them.

# Chapter Three – The Sixties

The 1960s saw a large increase in world trade. Europe had become more prosperous. As we saw in the last chapter, ship sizes were becoming larger. The exception to these was the general cargo ship types. They still tended to trade to cities, either close to the coast or far up rivers. The container revolution had begun in North America in 1955, but took some time to become established internationally.

General cargo shipping was therefore restricted to ports which often had enclosed docks where water levels were kept fairly constant with lock gates. Thus the beam and draught of ships using these ports was a significant limitation. Enlarging these facilities would have been an expensive and disruptive exercise. Even newer ports were reluctant to increase their flexibility by developing berths for larger ships. As an example, the Belgian port of Antwerp although largely spared by a retreating German army in 1945, its seaward approaches were not. In peacetime, the port was rebuilt, development being completed in the 1960s. Although much dredging had taken place, there was still a draught restriction, the port being tidal.

**This is an example of an enclosed dock, Albert Dock, Liverpool**

In the bulk carrier sector, average ship sizes increased as the decade progressed. Sizes ran from 10,000-dwt to nearly100,000-dwt as specialised berths were developed for these trades. In the case of iron ore, ports such as Sept-Îles in Canada were built at the end of a railway line running from the iron ore mines. Bulk carriers would load at Sept-Îles, the largest ore port in North America, for discharge close to steelworks in Europe.

In the tanker sector, average ship sizes were also on the increase. Economies of scale were better able to be implemented. Oil, being a liquid, could easily be transported over land via a pipeline. One example is the BP refinery at Grangemouth on the east coast of Scotland, about 12 miles upstream from Edinburgh. In the 1960s, this was restricted to ships of 15-20,000-dwt. To bring economies of scale into force, BP built an oil berth on the west coast of Scotland at Finnart on Loch Long. Oil storage tanks were hidden by being built into the hillside and two pipelines were constructed which ran across Scotland buried in the ground. Thus a deepwater port was capable of feeding crude oil into an oil refinery which had limited facilities on the other side of the country. Fortunately, oil products such as petrol, jet fuel, kerosene and gasoil were transported in ships small enough to load at Grangemouth.  Therefore the refinery was fed with crude oil from large ships and its products were shipped out in small ones.

## Specialised tonnage

Other products were now being developed in oil refineries and these required new specialised ship designs to be drawn up by naval architects. Among these products were liquid petroleum gases (LPG).  These gases included mainly propane and butane such as one would have in a disposable cigarette lighter. The ships were initially designed to have pressurised cargo containment systems, mainly spherical nickel-steel tanks. Other designs such as semi-refrigerated and fully refrigerated versions were added. Chilling gases to very low temperatures reduces their volumes enormously, increasing a ship's cargo capacity.

In due course, other gases were also carried. These included butadiene, ethylene, propylene, ammonia, vinyl chloride, ethylene oxide and chlorine.

With the production of crude oil, other associated commodities also appear. Condensate and natural gas are generated together and can be separated. The natural gas can then be used domestically or as a chemical feedstock. To transport it over long distances is made viable by its natural property of reducing in volume when it is chilled and liquefied. Ships were developed with containment tanks for the carriage of this cargo. They comprised large, heavily-insulated reservoirs where the gas, reduced in temperature to minus 160°C and in volume by 600-fold, was stowed.

No insulation is perfect so when the cargo gained slightly in temperature there was a 'boil-off' of gas. This was collected and burned under the boilers of the ships and used instead of bunker fuel.

**The inside of the insulated tank of an LNG carrier**

The first such ships were the *Methane Princess* and the *Methane Progress*. They traded between Algeria and the United Kingdom. Because the cargo boil-off was such a clean fuel and the cargo itself was non-corrosive, the ships had a long working life. They were eventually sold for scrap after 35 years of service.


**The two original LNG carriers**

In the 1960s there was an enormous rise in the production of chemicals of all kinds. Instead of shipping such cargoes in small containers packed in cartons, they started to be shipped in bulk. This was in small ships to start with and the chemicals were fairly benign. It would be a few years before large fleets of tankers were used to ship seriously dangerous chemicals in bulk. This subject will be covered in the next chapter.

## Private fleets

Fleet sizes became a feature of the 1960s. Shipowners such as Aristotle Onassis and Stavros Niarchos built up very large tanker fleets. These ships were placed on charter to the large oil companies. These mainly comprised the 'seven sisters', which were mentioned in the previous chapter: Shell, British Petroleum, Texaco, Gulf Oil, Chevron, Esso and Mobil controlled 85% of the world's oil. The oil company ships, especially those sailing under the Stars and Stripes, were extremely expensive to operate. So the financial attraction of chartering ships from these large shipowners was overwhelming.

Other shipowners with large fleets included Erling Naess with 16 tankers in his Anglo-Norness Group, and Daniel K Ludwig whose company, Universe Tankships, owned some five million deadweight tonnes of tanker tonnage with half a dozen of the largest ships built up to that time.

Ludwig was also a pioneer in another direction. He had a floating oil refinery built in Japan. He sold it to Brazil and it was towed from Kure to Rio de Janiero.

Other shipowners who prospered in this decade were John Chandris, whose company Chandris Hellas owned between 20 and 30 tankers. George Livanos and John Carras also had sizeable fleets.

**Greek shipowner Stavros Spyros Niarchos 1909 – 1996**

Most tankers when they have reached the end of their commercial lives are sold for scrap. The ships are demolished and their metal content recycled. Scrap steel is added to raw steel in the smelting stage to reduce the cost of the final product.

## Ships working in retirement

Those that have reached the end of their trading lives but still live another day are rare. But there again, turbo-electric ships are uncommon, but many Second World War tankers did survive the war: the T2s, described in chapter two. And if they did not transport oil, they could at least use their electricity-generating capability in a useful way. After all, they produced electricity and they had a capacity of some 15,000 cubic metres of oil to use as fuel. This was enough fuel to keep them generating current for more than a year. Thus their useful lives could extend for a great length of time.

And so it was in post-colonial Vietnam. Cam Ranh Bay was an important naval base. It did not have its own power station, so the navy solved the problem with T2 tankers. It purchased the *Memphis, Lone Jack, French Creek, Cumberland* and *Logans Fort*. Their generators were hooked up to the mains, rather than to the ships' engines and they powered the port and its infrastructure.

The nearby ports of Nha Trang and Qui Nhon also had similar power stations. Nha Trang had the *Kennebago* and the *Tamalpais*, while the *Mission Santa Ynez* and the *Rincon* were also based in Viet Nam.

Other instances of T2s being used for generating electricity for shore purposes was in Norway. A severe drought had reduced its hydro-electric capacity. A BP T2 tanker, the *Red Bank*, was purchased by Christiania Portland Cementfabrik at Slemmestad, west of Oslo.

**BP Tanker *Red Bank*, used to generate electricity in Norway**

On the other side of the world, electricity supplies to Dampier in Western Australia were destroyed by a severe cyclone. The city bought a turbo-electric New Zealand ferry, the *George H Evans*. This ship provided power to the community until the local power station could be rebuilt.

And in the Middle East, Lebanon struggled to provide sufficient power for its people. To keep the lights on, a Turkish ship, the *Fatmagül Sultan*, arrived off the coast of Beirut and was hooked up to the country's national grid as part of an innovative project aimed at tackling power shortages in developing countries.

While we are looking at the Middle East, there is more to consider than power outages. Having gone to war with each other in 1948 and 1956, the Arabs and Israelis decided to slog it out again in the 1960s. In 1967, tension was building up between the Arab nations surrounding Israel. These were Syria to the north, Jordan to the east and Egypt to the south.

## War yet again

On the 5th June 1967, Egypt mobilised ground forces in the Sinai Desert. In an effort to prevent the country being overrun, the Israeli Defence Force made pre-emptive air strikes against the Egyptian air force. This surprise attack largely destroyed all the aeroplanes under Egyptian control and gave Israel air superiority in the region. Israel then advanced rapidly across the desert to the Suez Canal.

**Ships trapped in the Great Bitter Lake**

Israel then turned its attention to the north and east, capturing the Golan Heights from Syria and the West Bank of the Jordan River from the Jordanians. The war was over in a few days and was called the Six-Day War.

Its effect on world trade was hugely significant. The Suez Canal was blocked by sunken ships at both ends and heavily sewn with anti-ship mines. It remained closed to shipping for more than eight years.

Many ships were trapped in the Great Bitter Lakes and most were fully crewed. To read about their way of life during this long period of inactivity, read *Appendix 14*)

## Ship collisions and sinkings

Readers who are less interested in the ins and outs of manoeuvring using radar should skip the next three paragraphs.

Casualties at sea remained a reality in the 1960s, despite much-improved designs for ship-borne radar. New features included a greater facility to enable the plotting of courses and speeds of surrounding vessels by watchkeepers. This enabled them to calculate the closest point of approach. But an easier way to track vessels is to take a compass bearing of them. If the bearing reduces, the ship will probably cross ahead of you. If the bearing opens up, it will probably pass astern. But if the bearing remains constant, it is time for the 'give-way' vessel to take action.

But watchkeepers who rely on electronics to track other ships are often involved in what became known as 'radar-assisted' close-quarters situations or even collisions.

The 'blip' on the radar screen is refreshed at every turn of the radar scanner. It remains on the cathode-ray tube for some minutes, gradually reducing in intensity. This leads to a visible tail attached to the target. Radar observers are inclined to read this as the approaching ship's true course and see that it is passing clear. In actuality, it is just a relative course as the observing ship and the target ship are both moving.

In 1961, the BP tanker *British Aviator*, of 40,000-dwt, was heading down the English Channel in ballast, on passage from Wilhelmshaven to the Persian Gulf. Sailing up channel was the British bulk carrier *Crystal Jewel* of about 16,000 dwt. The weather was calm with little wind, but dense fog. From the radar images, it appeared that both ships were passing clear of each other, but the watchkeepers on both vessels failed to plot the changing positions of each other's ships as recommended by government authorities. BP had even fitted the *British Aviator* with a separate plotting table; but the watchkeepers did not avail themselves of it.

At 08:51 on 23 September 1961, the ships collided. At the court of enquiry, both masters were found to be guilty of failing to follow the collision regulations. They did not plot the positions of the other vessel and they travelled at excessive speed in reduced visibility. Both lost their master's certificates. But Captain Jozef Leon Anczykowski of the *Crystal Jewel* lost more than his master's ticket. His young fifteen-year-old daughter was killed in the collision.

Bulk carriers of a similar size to the *Crystal Jewel* were becoming more popular. In Italy, the Ansaldo shipyard in Genoa designed 16-18,000-dwt bulkers to replace existing tweendeckers which, as mentioned earlier, had hitherto carried bulk cargoes. These had self-trimming holds with wide MacGregor steel hatchcovers to facilitate the use of grabs for the loading and discharging of bulk cargoes.

These were nicknamed *Bibolini-types*, in memory of Giovanni Bibolini, the father-in-law of the Italian shipowner, Glauco Lolli-Ghetti. But Bibolini had a greater influence on the development of bulk carriers than is realised.

The pioneer '*Bibolini type*' was a 15,800-dwt gearless bulk carrier of less than 500 feet LOA. It had both self-trimming and hoppered holds and a diesel engine capable of giving the ship a reasonably high speed with a low bunker consumption.

The shipowner asked Cantieri del Muggiano of La Spezia to design and build just such a vessel. He signed an order for six initial ships and an option for a further six, an unusual decision in those times.

But Bibolini died soon after the initial six were delivered. The company was nervous about continuing with this large order and sold the optional six to Finsider, a government-controlled company which almost monopolised pig-iron production in Italy.

The option was later converted to six vessels slightly bigger than the original design. These were operated by Sidermar, the maritime subsidiary of Finsider and became one of the pioneers in the development of the bulk carrier fleet.

Over their long lives all twelve of these ships developed healthy profits.

## Oil spills

Ships were getting larger and thus, accidents, especially marine oil spills were becoming more damaging. The *SS Torrey Canyon* of some 120,000-dwt was wrecked off the west coast of Cornwall when taking a shortcut. On the 18th March 1967, it struck Pollard's Rock on Seven Stones reef, between the Cornish mainland and the Isles of Scilly. It became grounded and, several days later, began to break up.

In an effort to reduce the size of the oil spill, the British government decided to set the cargo on fire, by means of air strikes by the Royal Air Force (RAF) and the Royal Navy Fleet Air Arm (RNFAA). A total of 16 rockets, 161 bombs, 44½ tonnes of kerosene and 1,500 tonnes of napalm were used. This was largely unsuccessful as the huge tidal range in the area extinguished the fires at high water. To date, this had been the largest coastal oil spill in history. But this record was not held for too many years.

## Cuban missile crisis

Tweendeckers still carried the majority of packaged and bulk dry cargoes. Some became quite notorious. In 1962, at the height of the Cold War, Russia and the United States of

America were great rivals on the world stage; centre stage in the early 1960s was Cuba. Communist-inspired Fidel Castro had toppled the Battista regime and established a communist state on the Caribbean island of Cuba, little more than 100 miles from mainland United States of America.

The Americans tried to depose Castro, but the invasion by Cuban rebels at the Bay of Pigs was a fiasco. So the Americans introduced sanctions against the country, banning foreign travel and Cuban imports such as sugar, Havana cigars and Cubans themselves. The Russians, under President Khrushchev, supported Cuba and, as if to seriously underline this support, started to ship arms to the country. President Kennedy objected strongly. And thus started what became known as the Cuban Missile Crisis. Russian merchant ships were photographed heading for Cuba with long tubular objects as deck cargo.

The US Navy swung into action. Further merchant ships were seen heading for Cuba. One was Russian-flagged and was allowed to pass. The other was a war-built Liberty ship, the Lebanese-flagged *Marucla*. This was boarded and on this voyage was found to be carrying paper products.

Photo-reconnaissance flights over Cuba found evidence of missile silos and missile launching sites. Khrushchev argued that the USA had established Jupiter missile sites in Turkey and Italy which could threaten Moscow, so the Soviet Union was quite entitled to erect similar warlike material with their allies. There appeared to be one law for the West and another for the communists.

With few domestic radio stations able to reach ships, especially in the developing world, read what it was like to be at sea during the uncertainty surrounding the Cuban Missile crisis in *Appendix 10*.

After difficult negotiations and a very tense standoff, the Russians agreed to dismantle the missiles and merchant ships were photographed carrying the missiles back to Russia. This was seen as a big climbdown by the USSR, but what was not revealed until a long time later was that the USA also withdrew her Jupiter missiles from Europe.

Unknown to the Americans, Castro retained some 100 tactical nuclear weapons on the island until long after the missile crisis ended. These were out of Russian control and required no special codes or additional commands from Moscow; just a ‘fire’ button with a Cuban finger on it. Lift the red hinged cover. Put a finger on the button. Apply some pressure and whoosh; World War lll.

After a period of time and having experienced the mood-swings and paranoia of the Cuban leader, the Soviet Foreign Minister, Anastas Mikoyan was tasked by the Russian leadership with depriving Castro of his new nuclear deterrent.

Mikoyan invented a story that it was against the Soviet constitution and Russian law for their weapons to be under the control of a foreign power. Reluctantly, Castro backed down and the weapons were crated up and shipped back to Russia in tweendeckers. The Politburo heaved a deep collective sigh of relief. Having experienced being on the brink of a nuclear holocaust, once was enough for everyone.

# Twilight for liners

Passenger shipping was very popular in the 1950s and 60s. Flying was slowly growing in popularity, but trans-Atlantic liners, such as the *Queen Mary* and *Queen Elizabeth*, offered ultimate luxury. Americans and Europeans spent four days of relaxing pleasure. The same could not be said of flying across the oceans.

**Air travel gradually took over from the comfort of ocean travel**

For a few years, passenger ships were subsidised by the mail they carried. The owners of large passenger ship fleets such as P&O, Orient Line, Union Castle, Messagerie Maritime, Hamburg America Line and Italian Line all benefited from the carriage of letters and parcels as cargo. But eventually airmail took over.

The fabulous ocean passenger liners gradually moved into the new fashion of ocean cruising. But there was a window of opportunity during this transition when countries such as Australia and New Zealand were endeavouring to increase their populations. The Second World War had exposed the threat posed from heavily-populated countries to the north. This was not just China; a threat of unregulated migration came from other countries such as Indonesia with a population of 250 million compared with Australia's 12 million. Therefore the Australasian countries offered passage to their lands for £5-10. Shipowners were eager to buy former passenger liners and use them to carry migrants across the world.

And when they had outlived their usefulness in this trade they were converted to luxury cruising. Italian and Greek owners were at the forefront of this trend.


**Passenger ships such as Sitmar Line's *Fairstar* ex-troopship Oxfordshire, were used for the transport of migrants**

## Japan ups the ante yet again

The world's merchant fleet saw enormous changes in the 1960s. Many of these were generated by Japan. In 1961 its government adopted a policy whereby 60% of Japanese cargo was carried on Japanese ships: The target for crude and petroleum product quantities was to be 65%. The oceangoing fleet would increase from 6.99 million tons gross to 13.35 million tons.

These targets were gradually increased during the 1960s so that, by 1969, the fleet would have increased by 4 million gross tons annually to reach a newbuilding target of 13 million gross tons. Technological development over the years allowed Japan to be the best shipbuilders in the world. Its welding technology overcame low temperature brittle fractures. Further developments included welding efficiency, weld-friendly types of steel such as submerged arc welding and electro slag, electro gas and $CO^2$ welding. In the mid-1960s the remarkable development of what was called 'finite element method packed with advancement of computer capabilities' took place.

At this time there were still a large number of war-built ships under Japanese flag. There was a fear that these would not comply with revised SOLAS rules. Some 113 of these ships were scrapped and replaced by 54 larger newbuildings, comprising 34 cargo ships, eight tankers and 12 coal carriers. The latter were mainly involved in the coastal distribution of coal for power generation.

The government contributed ¥92 billion ($828 million in 1961 currency) to the cost of these newbuildings and it held joint ownership. Unfortunately, boom time, which was prevalent in the markets at the beginning of the 1960s, was gradually taking a downturn.

But Japan was still increasing its share of world trade. In 1962 it had joined the Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF) as an Article 8 country. By the end of the decade, Japan's gross domestic product (GDP) grew 70%. Its import and export trade volumes doubled. In 1968, its exports exceeded its imports for the first time and it became the number one shipbuilding nation in the world.

Some stats: Exports amounted to 10 million tonnes in 1960. By 1963 these had risen to 16 million tonnes and 23 million tonnes in the next two years. Imports at the beginning of the decade were 87 million tonnes. This increased to 140 million tonnes in 1963 and almost 200 million tonnes by 1965.

But income was being squeezed and debts grew. Japan decided to restructure the shipping sector. There were 72 shipping companies in Japan. Many of these were brought together under six companies. These were NYK, MOL, K Line, Japan Line, Yamashita Shinnihon Line and Showa Kaiun. The government anticipated that its GDP would increase by 8.5% per annum. It would estimate that an additional 20.5 million gross tons of newbuildings would be required to carry all its additional imports and exports. This shipbuilding drive started right at the end of the decade in 1969. By this time its gross national product (GNP) had grown to ¥50 trillion, up from ¥31.7 trillion in 1965.

**Nippon Yusen Kaisha's (NYK) passenger cargo ship *Hikawa Maru*, now berthed as a museum ship in Yokohama**

And by the end of the decade, Japan had overtaken Germany to become the second largest economy in the world after the USA.

## Marine fuels

During this decade, most newbuildings being delivered were diesel powered. One exception was LNG carriers which were still using steam turbine machinery, taking advantage of the gas boil-off for fuel. And having pioneered nuclear power for civilian propulsion in the USSR, other countries started experimenting in the same way as the Russians.

The USA built the tweendecker *Savannah* in 1962. It was a useful research project, if only to prove one thing: nuclear power was expensive and was the subject of suspicion from the everyday man and woman around the world. People were justifiably anxious about glowing in the dark.

The Germans built a nuclear-powered merchant ship, the *Otto Hahn*, completed in 1968. The owners found it difficult to operate commercially and the ship was re-engined with diesel power after 11 years.

Japan's foray into nuclear-powered ships saw the experimental ship, *Mutsu*, laid down in 1968. It was commissioned in 1972.

## Summary

The 1960s saw the greatest increase in world trade for many decades. This was catered for by a very large newbuilding programme in Europe and Japan. Additionally, ship sizes increased as port facilities and port infrastructures were enlarged.

New cargoes such as LPG and LNG saw new ship designs being developed. We saw peace being shattered by the Six-Day War which closed the Suez Canal for eight years. This had a huge impact on world trade as tonne-miles to and from the Far East, and Australasia to Europe was impacted. Independent owners such as Onassis and Niarchos built up huge fleets, especially of oil tankers. There is a story that Aristotle Onassis was going bankrupt. He intended to commit suicide in his hotel in Buenos Aires. Then the Suez Canal was closed, freight rates increased sharply and Onassis put the gun back in his desk drawer.

We did not see every tanker scrapped which had reached the end of its trading life. Turbo-electric powered ships were used as floating power stations. Sadly, ship casualties had not gone out of fashion; ships still collided.

Different types of dry cargo had special ships designed for them; thus we saw the development of the bulk carrier.

Political differences emerged over the Cuban Missile Crisis which fortunately was peacefully settled.

A decline was seen in transoceanic passenger traffic in favour of air travel while new migration routes were established. The 1960s saw a rise in Japan's pre-eminence as a world leader in trade and it became the largest shipbuilding nation.

And the 1960s was perhaps the decade when naval architects were given the freedom to design the most elegant of ships, before slab-sided monstrosities became the fashion.

# Chapter Four – The Seventies

There were two main occurrences which caused enormous upheavals in the 1970s. One was a giant evolution in the way goods were transported by sea. The other was a quantum shift in the way oil was sourced, marketed, sold and transported.

Going back into history, oil exploration was conducted by the major oil companies; we looked at the 'seven sisters' in previous chapters. They went to the most inaccessible and inhospitable places on the planet. They set up drilling rigs in an area where the geologists directed and started to make holes in the earth's crust in places where the temperature difference between night and day was as much as 40°C. If they struck lucky, pressure contained within the oil reservoir forced the oil to the surface and drenched everyone in 'black gold'. The wellheads were then tamed.

Pipelines were laid to bring the oil to the coast or to the nearest deepwater river where storage tanks and jetties were built to assist in the transportation of the raw commodity to overseas refineries. In some cases, oil companies built refineries in places close to where the oil fields lay. One can think of Shell's refineries in Indonesia and Venezuela, British Petroleum's in Iran and South Yemen, and Italy's oil companies in North Africa. The countries where oil was discovered were paid a royalty and, over the years, this was deemed acceptable by those states.

But politics got in the way of commerce due to two reasons. Every oilfield has a period of major production and then, in time, it declines very quickly. This occurred in the USA in the late 1960s. The country had been the world's largest producer of oil. And suddenly it wasn't and needed increasing volumes of imports to keep the country's wheels turning. There was a shortage of tankers to keep the imports coming while the Suez Canal was still closed.

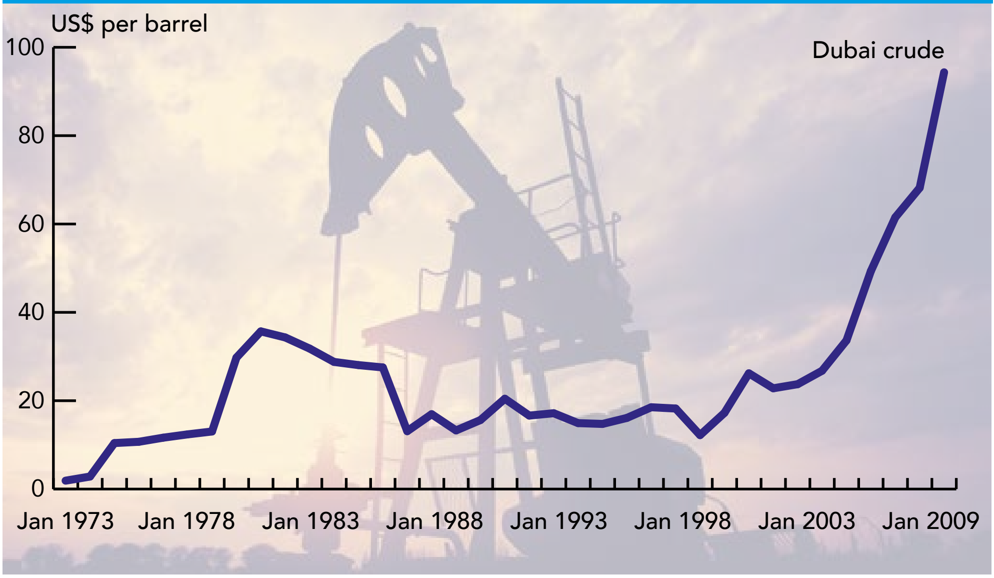
## Oil and politics don't mix

The second reason was the conflict in the Middle East. In October 1973, Syria and Egypt made a concerted and sudden attack on Israel, supported by other Arab nations. The conflict was mainly confined to the Golan Heights in the north and the Sinai Peninsula and the Sinai Desert in the south. Initial successes by Arab forces were gradually reversed by the Israelis. Both sides in the conflict were seen as surrogate pawns in that chess game called the Cold War, one operating for the United States of America on one side and for Russia on the other.

The Arab states recognised that support in the supply of war material, weapons and intelligence-gathering by the USA had assisted Israel in her success. In response, the Organization of Arab Oil Exporting Countries (OAPEC) increased the price of oil by 70%. Then, in order to maintain pressure on the industrialised nations, it decided on a monthly 5% cut in oil exports from the September 1973 levels. This is a measure of the growth in importance that Middle East producers had attained. After all, in 1949 the Middle East produced 9 million tonnes of crude oil. By the 1960s this had risen to 190 million tonnes.

An announcement that the USA would provide emergency financial aid to Israel further inflamed OAPEC countries. Libya announced an embargo on all oil shipments to the United States of America. Saudi Arabia and other Arab states quickly joined in the ban. At a meeting in Kuwait it was also agreed that exports be curbed to various other countries, including the UK and Japan. Deliveries of oil to the USA would be totally blocked as it was described it as 'a principal hostile country'.

**Prices since the 1973 oil shock**




But, as this book is principally about shipping, we must dwell on what was happening on the oceans of the world. Initially, now we are on the subject of oil, we should study the tanker sector.

## Tankers grow in size

In the first few years of the decade, world oil consumption was increasing rapidly. Shipbuilders in Europe and the Far East were building large numbers of very large crude carriers (VLCCs) to cope with this increased demand. The size of VLCCs was also increasing; from a deadweight of around 200-220,000-dwt towards the end of the sixties, to over 300,000 tonnes in the 1970s. But there was still not enough tonnage to go around and tanker earnings increased enormously. By the middle of 1973, VLCCs were being fixed from the Middle East to the USA or northwest Europe at Worldscale (WS) 300. Rates to Japan were higher at WS 350. This equated to about $75,000 daily; an unprecedented level at a time when running costs were little more than $4,000 per day.

Opportunistic shipowners saw ways of exploiting this demand. They had seen the success of even larger ships which exceeded 320,000-dwt and seized the moment. Shipyards were forced to produce designs for ships in excess of 375,000-dwt. And Shell ordered four ships in excess of half a million tonnes deadweight. In terms of gross tonnage, these were the largest tankers ever built, but not the largest in terms of deadweight. This honour falls to the *Seawise Giant* at 564,763 dwt and built in 1979. At this stage a prudent shipowner would have kept his hands in his pockets instead of reaching for a pen to sign a newbuilding contract. But not many did. There was no sign that the Suez Canal was going to reopen and all tanker traffic from the Middle East to the West was directed around the Cape of Good Hope. So the herd-instinct kicked in.

One example involved an Italian shipowner. In Italy, there was a law that obliged Italian owners to purchase their ships from Italian shipyards. At about this time the law was repealed. A Genoese shipbroker arranged for an owner to purchase two ultra-large crude carriers (ULCCs) of about 400,000 dwt from a European yard. The value was between $70 and $80 million for each ship.

This buyer had a great rival in Naples and when news of the purchase became public knowledge, wanted to order similar ULCCs. He entered into discussions with a German shipyard. The broker in Genoa was sitting in a deck chair in his back garden reading a shipping magazine and read that further orders had been placed; one by Norwegian owner, Sigval Bergesen. The broker contacted him and asked whether he would sell one of this batch he had contracted with a Japanese shipyard.

“If I can make twenty million on the deal, I will sell,” he said. So the deal was agreed and this ship, even with the added millions was still several million dollars cheaper than the German equivalent.

Italian owner Lolli-Ghetti bought two ULCCs whose building history was unusual. The hulls were built in a Portuguese shipyard, launched and then towed to Sweden for completion.

With the value of hindsight, what was a stroke of good fortune for brokers in Italy was a disaster for shipowners as the bottom fell out of the market. We should forgive politicians, because they know not what they do. Their deeds often cause widespread misery far from home. When global oil production took this nosedive, so did tanker demand.

## Combos

Shipowners have always been adventurous and innovative. Designs had been produced for what were termed combination carriers. These ships were generally of about 150,000-dwt. They had holds like a bulk carrier, but were also fitted with cargo pumps and lines and had oil-tight hatchcovers. The theory was that they could switch from bulk commodities such as coal or iron ore to carrying crude oil. There would have to be a large disparity in rates between wet and dry to encourage them to clean their cargo spaces sufficiently to switch from one type of cargo to another. But in the 1970s, with oil cargoes attracting earnings in excess of $50,000 per day, many were withdrawn from the dry-bulk sector. Among there were a few 90,000-dwt OBOs built in Italy for Lolli-Ghetti among others. This of course also led to a firming of dry-cargo rates and everything looked rosy. Tanker owners were smiling, bulker owners were smiling and shipyards were laughing out loud.

The Italian government-owned steel company, Italsider, recognised the value of reducing the ballast legs of round voyages that OBOs offered. It entered into negotiations with the American oil company Conoco Phillips to utilise such ships.

The intended trade would be loading oil in Libya for discharge on the east coast of the USA north of Cape Hatteras (USNH). After cleaning the cargo compartments, the ship would load coal at Hampton Roads for Italy.

Conoco Phillips wanted to own an OBO, but Italsider did not. So brokers looked around for an owner to buy a second OBO and place in on long-term charter to the steelmaker. One Italian owner turned down the opportunity for the strangest of reasons. He was superstitious and claimed to have put the wrong foot to the floor first when he got out of bed that morning.

A suitable owner was found and he bought the ship and entered into a contract. And the ships started to trade. Unfortunately after a few voyages, Libya placed an embargo on oil exports to the USA, so the contracts were frustrated: So superstitions do work sometimes.

## War again

And then the Yom Kippur war broke out in October 1973; oil prices increased, oil production was reduced and oil-producing nations took control of their own exports. The lead was taken by OAPEC and was followed by OPEC, which included many non-Arab producers. As the flow of oil slowed down, so tanker demand fell along with rates. For a VLCC, they fell from WS 300 in September 1973 to WS 100 by the end of the year. By April 1974, they had fallen to WS 12. But in the meantime more and more VLCCs and ULCCs were being delivered by shipyards, a real avalanche of ships sliding down slipways around the world. Many went straight into lay-up.

The four mega-ships that Shell and C.N.N., Paris had ordered from the French shipyard of Chantiers d'Atlantique had chequered careers. The *Batillus*, delivered in 1976, performed five voyages per year until 1980 from the Gulf to Antifer in Normandy. It completed two voyages in 1981 and three in 1983. It was then sent to the Norwegian port of Vestnes for layup. The *Bellamya* had a similar trading life. Both were scrapped in 1986, before their second special survey.

**ULCC *Batillus*; traded for only seven years**

Of the C.N.N. ship's *Pierre Guillaumat* was delivered in 1977 and had an even shorter trading life. It was scrapped after six years. But the fourth of the sister ships, the *Prairial*, had a longer life. It was delivered in 1979 and was also laid up in Vestnes in 1983. But it was recommissioned in 1985 and traded under various names until it was run up on Gadani Beach in 2003 and demolished. It was the only one that lasted for more than 10 years.

Generally speaking, modern shipping companies are far less scrupulous in their dealings with shipyards. The Shell *Batillus*-class tankers were ordered in 1971. When the writing was on the wall in 1974 and other ships were less and less employed, Shell might have walked away from the contracts, before the ships were built and paid suitable compensation to the yard. But there might have been government subsidies to consider, a problem less and less encountered as the years rolled by.

This short lifespan, as demonstrated by the Shell ships, had now become a common occurrence, especially for large VLCCs. By now, ships in excess of 320,000 dwt were described as ultra-large crude carriers (ULCCs). The ordering of such ships tolled the death knell for many European shipowners when freight rates went down and stayed down. They remained at less than operating-expense levels throughout the rest of the decade after what was termed the 'first oil shock'. And yes, as if one was not enough, there was a second one in the 1970s.

One ULCC, the *Jean Bart*, partly-constructed at the Chantiers d'Atlantique yard at St Nazaire, was towed to Marseille where she was laid-up. She was subsequently scrapped having never carried a cargo.

The reduction in oil production led to a slowdown in Japanese shipbuilding and production capacity was cut by 35%. The number of building docks and building berths was reduced from 138 to 73. There was a focus on fuel efficiency and this, coupled with the *Torrey Canyon* disaster, described in *Chapter Three*, forced the Intergovernmental Maritime Consultative Organization (IMCO), later to be renamed the International Maritime Organization (IMO), to become more active. It introduced more marine pollution or International Convention for the Prevention of Pollution from Ships (MARPOL) measures to protect the environment.

Looking at smaller ships for a moment, refined products from the lightest of aviation fuels to heavy fuel oils were carried in ships up to about 20,000 tonnes deadweight. In the late 1960s, Shell came out with a specification for a larger version it called a product carrier.

Shell's specifications were designed for the restrictions at its refinery at Stanlow, near Manchester in the Northwest of England. These were as follows:

| | |
|---|---|
| Deadweight | About 30,600 metric tonnes |
| Length Overall (LOA) | 560 feet |
| Beam | 84 feet |
| Draught | 36.5 feet |
| Tanks | fully coated and coiled |

The company invited proposals from shipowners around the world.

One shipowner who showed interest was Canadian Pacific.

It contracted three tankers from the Van der Giessen yard in the Netherlands. These were the *W.A. Mather, R.A. Emerson* and the *I.D. Sinclair*. The first two were fixed to Shell for five years timecharter at $7.05 per deadweight tonne per month. The third went for three years to Esso at a similar rate.

Many Scandinavian owners followed suit as well as Greeks, such as Rethymnis and Kulukundis and Niarchos. Italian owners were represented by companies such as d'Amico of Rome. It placed orders for two product carriers from Italian shipyards in 1973. These were delivered when the tanker market was at its very lowest level in 1975. One of them ballasted across the Atlantic and loaded grain in the USA for discharge in Italy; a perfectly acceptable cargo for a newly-built tanker with epoxy-coated tanks. Otherwise they were employed thereafter on the spot market at rather ruinous freight rates.

Although the Stanlow restrictions only applied to Shell-owned or operated ships, these dimensions became a standard for most product carriers in the 1970s.

## Big oil looks north and then offshore

When the first oil shock hit the energy sector, more effort was made to drill for oil offshore. Large discoveries were made in the North Sea and in Alaska. These fields were huge, the equal of any big discovery anywhere in the world. But they required a high level of expertise and innovation to bring this oil to market.

In Alaska, it is winter for eight months of the year, with the North Slope being 2.5° of latitude inside the Arctic Circle. For several months of the year, the workings are in perpetual darkness. There was a question in a comedy sketch, "What were you doing on the night of September to March?"

Because the oil-bearing strata are quite deep underground, the oil is hot when it reaches the surface. Special insulation is required to prevent the oil from then solidifying. It is stored in heated tanks before being pumped through the Alyeska pipeline. This is of 48in diameter and runs 800 miles from Prudhoe Bay on the North Slope to Valdez in the South. It has 12 pumping stations to keep the oil moving. It is then transported by sea to refineries on the US West Coast. The oilfield was estimated to contain 25 billion barrels of oil of which about 13 billion were recoverable. Initial production was two million bpd. This has now fallen to 600,000 bpd.

While the pipeline proved to be the best solution, other suggestions had been put forward. One proposal was actually put to the test. The US-flag steam tanker *Manhattan* of 105,000-dwt was fitted with an icebreaker bow and reinforced propeller and rudder. It forced its way through the Northwest Passage to the Arctic Sea, but not without suffering damage to its cargo tanks, some of which were ruptured. At Prudhoe Bay, it loaded a token one barrel of oil and headed back towards the Atlantic, assisted by Canadian and US icebreakers. The voyage was successful but expensive. The route was tested again in the winter, but the passage was blocked by ice that was too thick to cut through and the proposal was abandoned. That wicked White Queen of the North had won again. But global climate change may thwart this Queen's ambitions.

## North Sea

Then there were the offshore discoveries. The lifetime of a deepsea oilfield is divided into recognisable steps. The starting point is to understand the life cycle of an offshore oil and gas field, which broadly follows this sequence:

- seismic survey
- licensing round
- block concession award
- exploration drilling
- appraisal drilling
- development drilling
- field development
- commencement of hydrocarbon production
- ongoing field development
- installation inspection, repair and maintenance
- decline in production
- installation decommissioning
- return of the field licence.

The periods where shipping is involved are coloured in red.

Oil was discovered by British Petroleum in the North Sea, the discovery being announced in October 1970. The Forties field held an estimated 5 billion barrels of oil and the appraisal wells were drilled by BP's semi-submersible platform, *Sea Quest*. Oil production began in 1975 with the field's output being pumped through a subsea pipeline to a tank farm at Sullom Voe in the Shetland Islands. The facilities at Sullom Voe allow tankers as large as VLCCs to berth and to load full cargoes for distribution to refineries, mainly in Europe and North America.

The Forties field was not the first to be discovered in the North Sea. Phillips Petroleum discovered the Ekofisk field in the Norwegian sector of the North Sea a year before the BP discovery. It had an estimated 6.4 billion barrels of oil in place. Shuttle tankers such as the *Theofilus J. Vatis* were converted and were initially employed to bring the oil ashore. This in itself involved a great deal of innovation. A single buoy mooring (SBM) was installed to which the shuttle tanker attached itself. The loading pipeline was floated alongside the ship, lifted aboard and connected to the ship's cargo manifold for loading.

**Ekofisk complex at the height of its activity**

But this operational design is not without its hazards. In April 1977 a safety valve was incorrectly fitted to a pipeline. It resulted in a blowout which sent an estimated 13-20,000 tonnes of oil into the North Sea; the most serious accident in North Sea history. The famous 'Red' Adair came galloping to the rescue as he and his crew have done on so many occasions.

The North Sea is a harsh environment and the ships it has pioneered have been spectacularly successful. Rig supply ships have transported everything an offshore rig requires. If it is drilling, the rig needs fuel, drilling mud and drillings pipes and bits. It requires food and water to feed the crews as well as the numerous other things that support the work and human habitation.

The first recognisable and dedicated offshore support vessel (OSV) is generally considered to have been the *Ebb Tide*, built in 1956 to service the US Gulf offshore oil and gas industry.

The US Gulf is where the OSV industry began and developed before spreading outwards during the 1960s.

The influences that subsequently affected OSV designs came from many different areas; principally fishing, towing and salvage, the barge industry and the heavy lift sector. The specific challenges of discharging and loading cargoes between an installation and a vessel, often in adverse weather conditions, have also determined design standards.

**The first designs for offshore support vessels were based on the *Ebb Tide***

In the early years, all these influences created a vessel with more power than its size would normally warrant and with its accommodation and wheelhouse well forward. They had a large clear wood-sheathed main deck aft of the accommodation block for the carriage of deck cargo. With two large main diesel engines, two shafts, twin propellers and bow and stern thrusters, the emphasis was on manoeuvrability. Within the hull were cargo tanks for fuel, potable water, liquid mud and cement. A range of pumps was needed to discharge each of these cargoes onto the platform.

While the US Gulf-type OSVs were the first vessels to support the offshore oil and gas industry, it soon became clear that the harsher environmental conditions in several of the new regions being explored would require different designs. Much larger, more powerful and more robust vessels would be needed to service their needs. The transition was most obvious in the North Sea where the US Gulf-type vessels were quickly replaced by the new breed of OSVs designed and built in Europe. In more environmentally-benign regions, such as the Arabian Gulf and West Africa, there was less pressure for such a change. In these regions it was driven by factors such as safety, increased cargo requirements, longer transit distances, increased reliability and redundancy and legislative demands.

# Offshore rigs

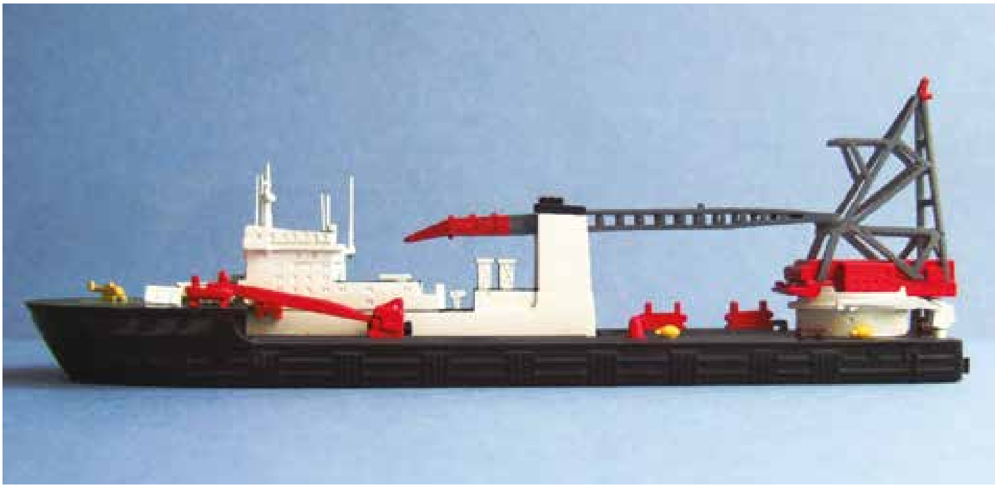
For exploration and production, there were several different designs of rig. Some had telescopic legs which sat on the seabed; so-called jack-up rigs. Some are semi-submersible which float like ships and are anchored in place. These are serviced by anchor-handling tugs which have heavy winches and other gear that enable them to manoeuvre rigs into position and deploy the rig's anchors.

About 18% of the worldwide drilling fleet are categorised as drillships. These vessels are specially designed to carry their drilling spread out to a deepsea location like a normal ship, but then carry out a drilling programme. A typical drill ship will, in addition to all of the equipment normally found on a large deepsea vessel, have a drilling platform and a drilling derrick located on the middle of its deck. It must be said that such ships are not the most elegant to a discerning maritime eye, but they work.

Additionally, drilling ships have a moonpool extending right through the ship's hull, which allows for the drill string to extend through the vessel, into the water and down to the seabed. Drill ships often operate in very deep water, well beyond normal anchoring depths.

To maintain the drill ship's geostationary position above the well, a dynamic positioning system is used. The drill ship is normally equipped with tunnel and azimuthing thrusters on the underside of the hull as a means of propulsion, manoeuvring and station-keeping.

As we have seen, some rigs are engaged in exploration while others are production rigs. In support of field infrastructure are other vessels such as survey craft which provide information on suitable pipeline routes. Seismic ships provide valuable data in respect of underground strata and possible oil deposits. There are pipe-laying vessels which lay pipes on the seabed to bring the oil ashore. There are rock-burial ships used to cover over-exposed subsea pipelines.

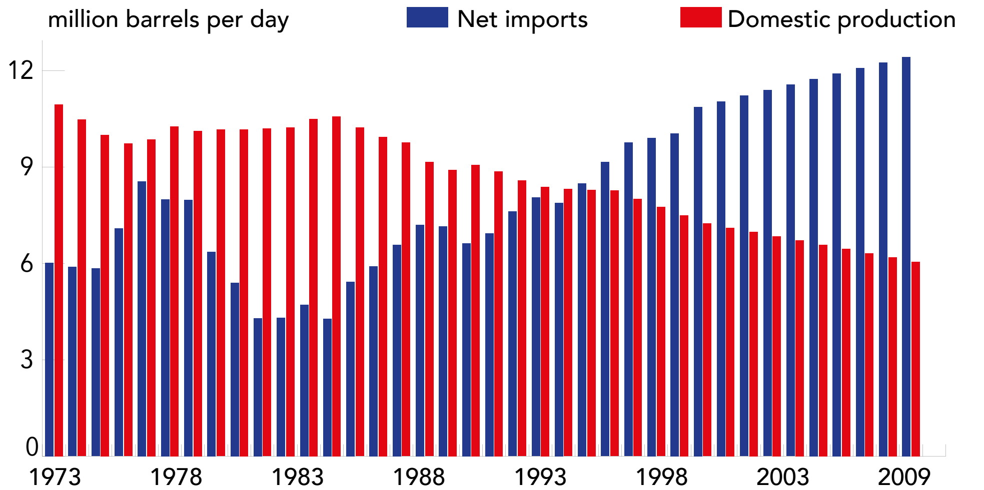


**Heavy construction and pipe-laying ship *Sea Troll*, built in 1976**

Many offshore support ships have a multipurpose role. They are used for offshore construction, dive-support, rig supply or anchor-handling. Their designs have evolved so that their types can be seen in all parts of the world where offshore oil production is progressed.

Exploration was made off the coast of Mexico in the 1970s, but one such exercise ended in disaster. The Mexican national oil company, Pemex, was drilling a well in the Bay of Campeche, off Ciudad del Carmen in June 1979. The drill hit the oil reservoir, but there was a blowout and the oil caught fire. This caused the exploration rig to sink. By the time the well was eventually capped, nearly half a million tonnes of crude oil was estimated to have escaped into the sea.

**US oil consumption make-up**




The other huge shift in the way shipping worked occurred in the dry cargo sector. There were those that felt that there was still a future in small tweendeckers. To this end, the Sunderland shipyard of Austin and Pickersgill designed a standard ship, the *SD14*. This stood for Standard Design of 14,000-dwt. The shipyard granted licences for yards in Brazil, Argentina and Greece to construct this design of ship. In all, 211 ships were built, most ending up in the hands of Greek shipowners. But this was the last throw of the dice for these comparatively small vessels before the container revolution took over.

## Containers

Whereas in previous decades, cargo, mainly manufactured goods, was carried in tweendeckers such as the *SD14*, there was a shift towards what was initially called unitisation. To reduce the manual handling of cargoes, they were carried on pallets or pre-slung in rope slings. This very much speeded up loading and discharging.

There were fewer wharfies down in the hold, who perhaps, hidden from view, rifled through the cargo for something to pillage. Fork-lift trucks were sent down into the holds and assisted in stacking cargoes in the tweendecks. But this was not enough to speed the passage of goods from factory to consumer. For this, a container was established internationally.

In a tweendecker, crew members were sent down into the holds on completion of discharge to check that all the cargo marked for that port had been discharged. In Mombasa, a Cadet was looking into the dark corners of No. 5 hold. In the upper tween deck he came across a broken case. He moved it to the cargo square and in the daylight, saw it was filled with 2lb jars of confectionary. They were all empty. The label read 'laxative chocolates'. Whether the stevedore was able to return to duty the following day, has not been recorded.

Containers were  introduced in continental USA in the late 1950s, but did not go global until the 1970s. It was then recognised that a small container ship which carried 1,000 to 1,500 20ft containers would replace five tweendeckers. But these were high speed, specialised ships which were costly to build. So shipowners got together to form consortia. One of these was Overseas Container Lines (OCL). Shipping groups such as P&O, Alfred Holt, Furness Withy and British and Commonwealth got together to form OCL and set about ordering suitable ships. By modern-day standards, these ships were very small. Nowadays they would be called feeder ships. The vessel which inaugurated the service was the *SS Encounter Bay*. It had a capacity of 1,900 teu and a speed of 21.5 knots. Most tweendeckers were of about 12,000 dwt. This container ship was 29,100 dwt and with its high speed and quicker port turn round, it is easy to see why it would have replaced five tweendeckers. The vessel also had electric hook-ups for nearly 400 refrigerated containers, powered by the ship's alternators.

To compare the speed of container ships with a war-built Liberty ship, go to *Appendix 6 and 7*.

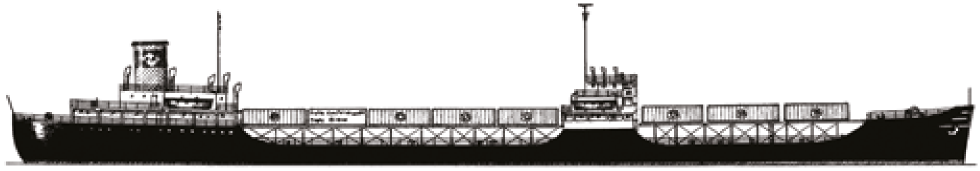
**One of the first dedicated container ships, *Encounter Bay***

Initially, running costs were comparatively low. Some of the ships went for speed rather than economy. Some ships in the OCL fleet had three huge steam turbine engines driving three propellers giving a speed of 28 knots. In the process they burned 500 tonnes of fuel oil per day. This sounds expensive, but fuel oil in the early 70s was cheap, at about $12 per tonne. As we have seen earlier in this chapter, this was to change as the decade progressed. Some ships were fitted with much more economical diesel engines; these were generally smaller at 1,000-1,100 twenty-foot equivalent units (teu). But as more and more box ships were commissioned, the relevance of tweendeckers became less and less.

Most people identify a trucking entrepreneur from Carolina, Malcolm McLean, as the father of containers. But as early as 1792, large wooden boxes, similar to the modern container were used to ship goods in horse-drawn transport and by railway in England. The US Army used containers in the Second World War to distribute supplies more quickly.

But it was McLean who pioneered the carriage of containers by sea. In 1956 he bought a shipping company, initially to carry both the truck and its load by ship. But soon the idea grew that it would be more efficient just to carry the container. It could then be loaded at the factory, transported to the port, loaded onto the ship, transported to the destination port, unloaded and trucked or shifted by rail to the consumer. This was termed intermodalism.

The inaugural shipment was aboard the converted tanker *Ideal-X*. It sailed from Newark, New Jersey to Houston, Texas on the 26th April 1956. The cargo comprised 58 containers on its decks and gasoline in its tanks. The freight costs made a lot of sense. The cargo cost about 5% of the then conventional freighting costs. Thus the container trade was born, but with some modifications along the way. McLean's original containers were 35ft long. This evolved into 20ft and 40ft boxes. Because of the American origins of this sector, all measurements are in imperial measure rather than in metric. The capacity of ships is measured in twenty-foot equivalent units (teu), although they are all capable of carrying a mix of 20ft and 40ft boxes.



**Tanker Ideal-X converted to container ship**

As this sector grew and more ships entered service, the relevance of tweendeckers diminished. But they were still useful for trading between ports without the capacity for handling containers. These required tall gantry cranes to handle the large weights involved. A 20ft container weighs about 14 tonnes, while a 40ft container weighs about 28 tonnes.

One of the pioneers in international container trades was a small British company, Manchester Liners. As early as 1968 it had a container ship delivered from Smith's Dock, Middlesbrough, followed by three sister ships. The company's trade was Manchester to Montreal. Although only 550-teu each, they sailed trans-Atlantic for most of the 1970s, running a weekly service.

Manchester Liners built a container terminal at No 9 dock Salford near Manchester and another one at Section 70, Montreal.

They came in at the very start of the container revolution with fast, ice-strengthened ships which could trade summer and winter driven by twin Pielstick diesel engines providing 18,000 bhp and capable of breaking through the St Lawrence ice.

Most first generation box ships were gearless; that is, they were not fitted with cranes. But as containerisation spread to ports without gantry cranes, geared ships were deployed. These were fitted with cranes with a safe working load (SWL) in excess of 30 tonnes. Some designs had a gantry crane which straddled the ship's deck and moved between holds and could load or discharge on either side of the ship. By the end of the 1970s the largest container ships were little more than 2,000-teu.

In this decade another class of ship was also developed. This was called a roll-on/roll off (ro-ro) ship. The vessel was accessed by bow and stern ramps so that cargo was wheeled or 'rolled' on and off the ship. Internally, various decks were also accessed by ramps which could be raised to access space up towards the upper deck. This enabled the ship to be filled up from the top down. These ships' sizes were described in 'lane metres' which represented the lengths of nine-foot-wide lanes the vessel would contain.


Credit: Automotive Logistics

**Italian car carrier, *Grande Detroit***

When the oil shocks continued to hold countries such as the USA to ransom, motorists bought smaller and more economical cars. Gas-guzzlers became modern-day dinosaurs. At that time Japan was gaining a reputation for building high quality small cars as well as ships. Exports of Japanese cars grew exponentially. Therefore, a version of the ro-ro was developed to carry cars and trucks. These were called pure car or pure car and truck carriers, or PCCs and PCTCs. They were not attractive ships; generally speaking, most of the naval architects remained anonymous.


Credit: Naviarmatori

**Italian RoRo, *Jolly Diamante***

In this decade, the main ports between which these container ships traded were Felixstowe, Tilbury and Southampton in the UK. In mainland Northern Europe, they comprised Le Havre, Antwerp, Rotterdam, Bremerhaven and Hamburg. In Southern Europe, Algeciras, Barcelona, Genoa, Gioia Tauro and Marseille.

East of Suez, they included Bombay, Colombo, Singapore, Hong Kong, Kaohsiung, Kobe and Yokohama. In North America, the obvious candidates were Boston, New York and other eastern ports, and San Francisco, Long Beach, Los Angeles and San Diego on the west coast.

In this decade there were those who believed that ships should be able to multitask. Several designs of multipurpose dry cargo ships were developed. One of these was the Japanese-designed *Freedom*-type. These were about 16,000-dwt and could work efficiently in dry-bulk trades, carrying cargoes such as iron ore, grain, coal, phosphate rock, potash and bauxite. With their wider hatches, they could also carry containers or steels.

Towards the end of the decade, things had become grander in scale. The *Combi King 45* appeared on the scene. As the name suggests, at 45,500-dwt this was much bigger. The ship could carry similar bulk cargoes to those described above and in addition, standard

**Serious civil upheaval in Iran affected shipping badly**

pipe lengths and packaged timber. Its container capacity was 2,127 teu of which 1,069 were carried on deck.

Shipbuilders in Japan set the standard for bulk carriers, which are still followed to this day. The *Fortune* design of bulk carrier was typical for a handysized ship. It had a deadweight of about 27,000 tonnes with six holds served by four deck cranes. It was Great Lakes fitted with a low ice-class classification.

## Oil shock mark 11

Earlier in this chapter, we spoke of the 1973 oil shock, but there was a second. In Iran, there had been civil unrest centred round the autocratic rule of the Shah of Persia, backed by his secret police, the dreaded Savak. Demonstrations by both religious and lay people grew and grew, but were met by armed police and the army. These confrontations became increasingly violent as opposition to the Shah was stirred up by the exiled Shia Muslim cleric, Ayatollah Khomeini.

These demonstrations severely disrupted the Iranian oil sector. Production was much reduced and exports were curtailed. In November 1978, 37,000 oil workers went on strike at the country's oil refineries. Before the revolution, the country produced nearly 6 million barrels of oil per day. By 1980 output had been reduced to 1.5 million barrels, an amount sufficient only for domestic consumption but not for export.

This had an extremely serious effect on shipping; the tanker sector was still suffering from the first oil shock. The loss of Iranian exports amounted to two VLCCs per day. The influence of OPEC had made the global supply of oil quite a fragile equation. The loss of a mere 4% of production had a serious effect on the West, particularly the USA. Queues at petrol pumps extended to whole city blocks.

Worldscale rates for VLCCs which had remained in the low WS 20s since the first oil shock, had started to claw their way back into profit. By 1978, they had started to average WS 30 and by mid-1978, WS 48. But with the loss of Iranian output, they had slumped back down again to the WS 20s. In comparison, in the third quarter of 1973, they had averaged WS 235.

## Bulk carriers grow up

The 1970s also saw an increase in bulk carrier sizes. At the beginning of the decade, most bulk cargoes were carried in 25-40,000-dwt ships. Later in the decade, the major bulks such as iron ore, grain and coal were shipped in what became known as Panamax bulkers. Their design was such that they were of a maximum size to transit the Panama Canal. Their beam was 32.3m (106ft) with a length overall (LOA) of 289.56m (950ft) and a draught of 12.04m (39.5ft). These dimensions enabled them to squeeze through the locks. In those days, their deadweight was about 65,000 tonnes.

The closure of the Suez Canal in 1967 had a similar effect on the dry cargo market as it had had on tanker trades. Shipowners decided to increase the size of bulk carriers which then became known as Capesize bulkers. The upper size range increased as discharging terminals became large enough to handle such larger sizes. They went from 80,000-dwt to 120,000-dwt until the largest sizes came in at 150-165,000-dwt.

Some were designed purely as ore carriers. To make them work comfortably, especially in heavy weather and because of the heavy weight of the cargo, they were generally loaded in alternate holds. Holds 1, 3, 5, 7 and 9 had cargo in them, while the even-numbered holds were empty. One can imagine the shear stresses involved. The loaded holds had a downforce of as much as 30,000 tonnes, while the empty holds had an upwards buoyancy force of a similar amount. These opposing forces were all acting in opposite directions at the dividing transverse bulkhead.

Many of these large ships suffered structural damage, much of which was caused by poor loading techniques. Cracks were discovered around strong points in the ships' structures, most caused by the unusual and concentrated heavy loads and bending stresses. For ships designed and built in the 1970s, these did not become apparent until several years in service. Much more will be covered in the next chapter, when the chickens came home to roost.

## Casualties increase

The increased size of bulk carriers, both tankers and dry bulk, meant that incidents such as collisions and groundings became much more serious. In December 1972, the South Korean tanker *Sea Star* was in collision with the Brazilian tanker *Horta Barbosa*. Both vessels caught fire and 12 sailors died.

In March 1978, the VLCC *Amoco Cadiz* was negotiating a storm off Brest in France. The heavy weather damaged the ship's rudder and it was unable to manoeuvre. Despite sending out distress calls, the ship ran aground on the French coast, broke up and spilled nearly 220,000 tonnes of crude oil.

Little more than a year later, in July 1979, the Greek-flagged VLCC *Atlantic Empress* was caught in a tropical storm north of Trinidad and Tobago. In poor visibility, it was in collision with another Greek tanker, the *Aegean Captain*, and badly damaged. Despite being taken under tow by a salvage tug, the ship sank. The oil spill amounted to more than 280,000 tonnes but, fortunately for the surface environment, much of it solidified on the seabed.

## Nuclear experiments again

In this decade ULCCs were largely powered by steam turbine, although by now, much larger diesel machinery had been designed and built for these bigger vessels. It was in this decade that the Japanese decided to experiment with nuclear fuel. It commissioned the *Mutsu* which was delivered in September 1972. It was not a commercial success, mainly because of a radiation leak in its early life which spooked everyone, particularly the fishermen who blockaded ports to keep it out. The ship was decommissioned after 20 years, having never loaded any cargo. There were no reports of any crewmembers or shore staff loitering in the vicinity of the ship having 'glowed in the dark'.

After its experiment in nuclear icebreaking with the *Lenin*, described in a previous chapter, the USSR ordered larger icebreakers such as the 23,500-dwt *Arktika*-class of six vessels which were ordered with launchings starting in 1975. *Artika* was the first surface vessel to reach the North Pole.

## More comings-together

Close to Christmas in 1977, two sister ships were approaching each other off the coast of South Africa. The 330,000-dwt *Venoil* and *Venpet* were launched within three months of each other in South Korea in 1973. The former had loaded 285,000 tonnes of Iranian crude oil and was on laden passage towards Canada. The *Venpet* had discharged in Newfoundland and was on ballast passage back to the Persian Gulf. In a similar situation to the Dutch passenger ships *Willem Ruys* and *Oranje* when they collided in the Red Sea in 1953, the two VLCCs went too close and hit each other. This apparent overzealous demonstration of a Christmas greeting caused serious damage to both ships resulting in two deaths and the spillage of 30,000 tonnes of oil. The extensive damage to both ships was repaired. They were both later sold and underwent name changes. Having been built in the same

***Seawise University***, ex-***RMS Queen Elizabeth***, sunk in Hong Kong Harbour

year, both were scrapped in the same year, 1984, the *Venpet* having been hit by an Iraqi Exocet missile in the Iran-Iraq war.

Passenger ships were gradually being replaced by aeroplanes. Two of the most famous ships, the *RMS Queen Mary* and the *RMS Queen Elizabeth* were withdrawn from service. The *Queen Mary* was sold to the city corporation and moored alongside at Long Beach, California. The vessel acted as both a tourist attraction and as a floating hotel where it remains to this day. The *Queen Elizabeth* did not share such a gentle and dignified retirement. It ended up as a floating university set up by shipping magnate C Y Tung in Hong Kong and renamed *Seawise University*. During refurbishment in 1972, it caught fire.

Huge amounts of firefighting water caused it to become unstable and it took on a large list and sank. It was broken up in situ, but not before it became a star of the show again. It appeared as the headquarters of MI6 in the James Bond film, *'The Man with the Golden Gun'*.

## Conclusion

In the 1970s we saw political influences taking over the oil industry, its production, distribution and consumption. Having become a net importer of oil in 1948, the USA, which was the largest consumer, importer and producer of oil, lost the third title. We saw how commodity embargoes were introduced to shape world affairs. During this decade we saw the huge growth in ship sizes, in both tanker and dry cargo units. Containerisation was brought to international prominence in the 1970s in an unstoppable change to the way that manufactured goods were shipped.

Ore/oil and oil/bulk/ore ships influenced the rise and fall of dry bulk and tanker markets. The offshore oil sector rose to become a significant player in the shipping market. There were two serious oil shocks and the Shah of Iran was sent to exile, the world losing 4% of its oil supply. And lastly, we recorded that the bigger the ship, the bigger the accident, and the bigger and more widespread the environmental damage.

So for the struggling anti-pollution teams sent to save the world from such an oily end, you all deserve a medal.

# Chapter Five – The Eighties

In the 1980s, Japanese shipbuilders built the majority of the world's ships; they had a global dominance. But this started to be challenged by its smaller neighbour, South Korea. European shipbuilding was fading away and only high-cost vessels were built in the West. These were mainly Class 1 passenger ships. European interior designers came fresh from luxury hotels and turned their considerable talents towards designing ship interiors including comfortable cabins, leisure facilities, dining rooms and even shopping malls.

Other high-ticket-price ships were gas carriers, cable ships and ice-breakers. Generally speaking, passenger ships were produced by France and Italy, gas carriers by Sweden and the Netherlands, and cable ships by the UK, Finland and France. Ice-breaker designs were refined and such ships were built in Finland and Russia. The latter producing a nuclear-powered version which never needed refuelling; this was ideal for the far Northern latitudes where ice is king.


**High-ticket-price ships include nuclear icebreakers such as the *Taymyr***

In the East, to increase profits, Japan built shipyards in countries where labour was cheaper. These included the Philippines, Vietnam and Malaysia. Singapore and Taiwan had their indigenous shipbuilding industries and produced many standard designs of their own.

## South Korea emerges onto the shipbuilding stage

In these early years, in South Korea, the standard of build was not up to the level of the Japanese. For example, the oil company Shell contracted a series of Aframax tankers from Hyundai Heavy Industries in Ulsan. To oversee the build, they brought in more than 70 superintendents, a veritable army, to guide the builders into correct construction techniques and methods. This was in addition to the Lloyds Register surveyors. In comparison, a shipyard might allow one superintendent to follow the construction phases nowadays. But shipyards now have a greater depth of knowledge than the superintendents and South Korean ships are built to a very high standard.

Far Eastern shipyards competed heavily on price with each other. And they know who to target. Shipowners have been the same throughout the decades; they are unable to walk past what they see as a bargain. We touched upon the herd instinct in the previous chapter. What shipowners have never been able to grasp is that they work their calculations out on current markets and current market predictions. What they fail to factor in is that by introducing more new ships into seaborne trades, they dilute the gravy and their profits fall. And with operating costs being higher for vessels built under external finance, the older ships of more than seven years old are able to operate at lower daily rates. So there is hardly ever such a thing as a bargain. And niche markets get quickly over-populated.

This happened to the tanker trades, as described in the previous chapter, and remained as a hangover into this decade. It became a serious problem in the dry-bulk trades in the 1980s.

## The Sanko deal

The Japanese shipping company Sanko Kisen Kaisha invented a novel way to fight its way out of these economic depths to which the dry-bulk market had sunk. It capitalised on the then current low shipbuilding costs and placed orders for 125 handysized bulk carriers. The finance for these ships was brought in from overseas trading companies. There was a suggestion that the deal was supported by the Japanese government to bring new business to Japanese shipyards; Sanko's founder, Mr Toshio Komoto was a minister of state in the Japanese cabinet. Sanko had masterminded a similar deal in the early 1970s. It had placed orders for 50 Aframax tankers, which were then chartered to Western ship operators and oil companies. There

**Toshio Komoto, founder of Sanko Line and Japanese government minister**

was little profit in the deal for Japanese shipyards, but it kept them ticking over. Sadly, orders for the bulk carriers did little for the company and in 1984, when debts had reached $5 billion, the shipping company became insolvent and filed for bankruptcy. During these early years of the decade, shipowners were seeking other ways to work their way through the depression.

## Innovations

A few owners bought obsolete tweendeckers from European liner operators and, with cheap manning costs, competed well at the smaller end of the bulk markets. For instance, they would load rice in the Far East for discharge in West Africa. They would ballast across the South Atlantic to Brazil and load sugar or soya beans for discharge in countries in the Far East such as Indonesia.

But trades such as these suffered from political pressure. The Indonesian government was bearing down on the population of the former Portuguese territory of East Timor. The country had declared independence from Portugal after a struggle by the revolutionary freedom movement in the 1970s. It was then invaded by the Indonesian military who savagely annexed the area as its 27th Province.

Brazil, also a former Portuguese colony, became more and more concerned for the fate of the more than a million Portuguese speakers and predominantly Christian people in East Timor. So, in the 1980s, they refused export licenses for commodities bound for Indonesia. This put a stop to a lucrative trade in soya. At the same time, the dry-cargo market was still going through one of its cyclical downturns. SD14s and Freedom-class bulk carriers were forced to embrace every possible trade available for smaller bulk carriers as more and more newbuilding bulk carriers sought employment in a shrinking market: So elderly tweendeckers became obsolete once more. The lyrics from the James Bond movie, *'You only live twice'* spring to mind.

## Ship management sectors

In these challenging times, owners were forced to study their cost bases. The management of their ships was one source of heavy expenditure. Ship management gradually became a service which large shipowners could offer smaller owners. The former would spread their management costs over more ships, thus reducing their own costs per unit. The latter could disband their own ship management departments and reduce operating costs per ship. There were different types of ship management.

At the lowest end of the scale is crew management. At the top of the scale is total management which performs every requirement including crewing, maintenance and drydocking and financial management. It does everything apart from arranging the ship's employment; and if required, could also include this as well.

In the early 1980s, both tankers and dry bulk trades were struggling to find profitable employment. The emerging container trades were doing better. Shippers discovered that moving goods by container was a lot cheaper than by tweendeckers. Thus they were prepared to pay the freights that the liner companies demanded. This led to fleet expansion as demands for this mode of shipping increased. The example shows the step-by-step expansion by the container shipping group Atlantic Container Line (ACL). (*See Appendix 14*.)


**ACL ship 1985-built *Atlantic Conveyor* replacing the ship of the same name sunk off the Falkland Islands in 1981**

As an example, a consortium of five major European steamship companies joined together to meet the high capital investment involved in building and operating an innovative fleet of roll-on/roll-off container ships. This historic union, the first of the container age, resulted in the creation of Atlantic Container Line (ACL), serving the trade between Europe and the East Coast of North America. The founding companies were Wallenius Lines, Swedish America Line, both from Sweden, The Transatlantic Steamship Company of Liverpool and Holland America Line from the Netherlands. These were joined later by Cunard and Compagnie Générale Transatlantique (CGT), also known as French Line.

## War yet again

A major conflict affected tanker trades in the 1980s. The Iran–Iraq War began when Iraq invaded its neighbour in September 1980. There had been a long history of border disputes between the two countries. It was also caused by a fear that the Iranian Revolution the previous year would inspire a revolution among Iraq's long-suppressed Shi'ite majority. Iraq also held an ambition to replace Iran as the dominant Middle East Gulf state. It decided on force.

The escalated conflict led to the so-called tanker war which started when Iraq attacked the oil terminal and oil tankers at the Iranian oil terminal of Kharg Island in the northern Gulf in early 1984. Iraq's aim in attacking tanker shipping was to provoke the Iranians into retaliating with extreme measures. These would include closing the Straits of Hormuz to all shipping. It was hoped that this would bring about some sort of US intervention.

The United States of America had threatened several times to intervene if the Strait of Hormuz were closed. But the Iranians suspected such a motive and restricted their retaliatory attacks to Iraqi shipping, leaving Hormuz open to general shipping.

Iraq declared that vessels visiting Iranian ports in the north of the Gulf were subject to attack. They used air power, primarily Mirage F-1s and MiG-23 fighter jets, armed with French Exocet anti-ship missiles, to underline their threats. The Iraqi airforce set to with the saturation bombing of Iran's main oil export facility on Kharg Island. This caused increasingly heavy damage to its infrastructure.

In May, and in retaliation for these attacks, Iran attacked a Kuwaiti-flagged tanker carrying Iraqi oil. It was sailing in a southerly direction off Bahrain. It also fired on a Saudi tanker in its own territorial waters a few days later. As a result of the land war, Iraq had lost its outlets to the sea and had become a landlocked country. It therefore had to rely on its Arab allies, mainly Kuwait, to transport its oil. This forced Iran into attacking tankers carrying Iraqi crude oil from Kuwait and this escalated into firing on tankers from any Persian Gulf state which supported Iraq. Attacks on ships of non-combatant nations in the Persian Gulf sharply increased thereafter, with both Iraq and Iran attacking oil tankers and merchant ships of neutral nations in an effort to deprive their opponents of war material. In June 1984, Saudi F-15 Eagles shot down a couple of Iranian F-4 Phantoms. Due to the damage caused to third-party vessels, Iran moved its crude oil export facilities to Larak Island, near Bandar Abbas in the south.

**Frigate *USS Stark*, hit by Iraqi missiles**

Lloyd's, the British insurance market, estimated that the tanker war damaged 546 commercial vessels and killed about 430 civilian sailors. The largest portion of the attacks was directed by Iraq against vessels in Iranian waters, with the Iraqis launching three times as many attacks as the Iranians. But Iranian speedboat attacks on Kuwaiti shipping led Kuwait in 1986 to formally petition overseas navies to protect its shipping. In 1987, the Soviet Union decided to charter tankers, protected by units of the Russian navy. And in the same year, the US Navy offered to provide protection for foreign tankers reflagged and flying the Stars and Bars. This they named *'Operation Earnest Will'*. Neutral tankers exporting crude oil from Iran were not protected by this operation, resulting in reduced foreign tanker traffic to Iran, since they risked Iraqi air attack. Iran accused the USA of helping Iraq. During the course of the war, Iran attacked two Soviet Navy ships which were protecting Kuwaiti tankers.

To try and keep its exports flowing, Iran chartered foreign VLCCs to pick up its crude oil from Larak Island. Strongly protected Iranian tankers ran a shuttle service from Kharg Island to storage ULCCs such as the 458,000-dwt *Burmah Enterprise* and its sister *Burmah Endeavour*. Also, the world's largest tanker, the *Seawise Giant*, which was hit and damaged by Iraqi Exocet missiles, was also storing Iranian crude oil. VLCCs berthed alongside these giants to load export cargoes. The land war dragged on in a stalemate until a ceasefire was agreed in 1988. The number of casualties on both sides is unclear, but figures of between 500,000 and one million dead on each side are bandied about.

## Conflict spills over

Middle East politics, this time the Arab-Israeli historic enmity, affected the shipping sector in October 1985. The Italian-owned cruise ship, *Achille Lauro*, was hijacked by the Palestine Liberation Front (PLF), a faction of the Palestine Liberation Organisation (PLO) off Egypt. It ordered the ship to be diverted to Syrian waters where it anchored off Tartous where the passengers and crew were held hostage. Demands were made that 50 Palestinian prisoners held in Israeli gaols be released. But the Syrian authorities refused permission for the ship to dock in Syria and the four terrorists then negotiated a free passage from Egypt in return for directing the ship to Port Said in Egypt. During the incident, a wheelchair-bound passenger, Leon Klinghoffer, was shot dead and his body and chair were thrown over the side.

**Italian cruise ship *Achille Lauro*, hijacked by PLF terrorists**

The hijackers were allowed to board an Egyptian airliner bound for Tunisia. But the aeroplane was intercepted by US F-14 Tomcats from the aircraft carrier *USS Saratoga* and escorted to Rome, where the four terrorists were arrested by the Carabinieri.

## Bulk carrier stresses become deadly

In addition to tanker disasters, the bulk cargo sector also suffered from serious casualties. In September 1980, the 170,000-dwt British-flagged OBO *Derbyshire* was lost south of Japan during typhoon Orchid. All hands, amounting to 42 crew members and two wives, were killed in the disaster. Experts suggested two possible causes for such a loss. Both included a sinking due to structural failure of important components.

The first was the misalignment of two longitudinal girders at frame 65. As evidence, cracks were discovered in a Swan Hunter-built sister ship, the *Kowloon Bridge*. Swan Hunter built six ships of the *Derbyshire* class. In 1982, the crew of the *Tyne Bridge*, which was ploughing through heavy seas off Hamburg, radioed that a crack had appeared in the deck around frame 65. Just over an hour later the crew reported that the crack had widened visibly. The ship was subsequently repaired but was scrapped five years later.

The second hypothesis was that heavy seas had stove in the steel hatchcovers at number one or two hatch. These vessels were not fitted with a fo'c'sle and the fury of the seas had nothing to stand in their way. Also, they had no additional buoyancy up forward. In actual fact, after the wreck was found and surveyed, it was discovered that the small hatch leading to the bosun's store compartment under the fo'c'sle head was not fastened shut and thus the ship's buoyancy had already been prejudiced as the large storerooms were flooded. Its forward freeboard was lessened by this oversight, making the cargo hatchcovers even more vulnerable. It is estimated that, with its full cargo of iron ore, which weighed five times the weight of the Sydney Harbour Bridge, the ship sank in seconds.

This one disaster led to the IMO passing legislation that empowered classification societies to demand a standard design for bulk carriers, which included a raised fo'c'sle. But this took many years.

## Unexpected offshore subsidence

Other seagoing disasters also occurred in the 1980s. In the middle of the decade, the Ekofisk oilfield in general, and the platforms serving it in particular, were found to be suffering from an unexpected degree of subsidence. A detailed geological survey showed that it was the result of delayed compactional diagenesis of the chalk formation reservoir rocks. As hydrocarbons are produced, the pore pressure declines and the associated stress leads to a sinkage of the seabed.

To attempt to reduce this subsidence, water was injected into the rock formations to replace the oil that had been retrieved and to re-pressurise the oil-bearing strata. But the water had different qualities from the oil in terms of compaction strength and the seabed continued to fall. Already at two metres, experts suggested that a total drop of six metres was possible. This was too much for the safety of the platforms and more was necessary to keep them secure.

**The whole offshore complex was threatened with a 6m subsidence**

The Norwegian government pressurised the operator, Phillips Petroleum, to remedy the situation and the French company Technip was contracted to find a solution. As five of the seven platforms were interconnected, they had to be jacked-up by about 6m simultaneously. It was decided that the steel tubular legs of the platforms were to be extended. Large flanges were welded to these legs and when they were all ready, the five platforms would be lifted all together in one operation. After that, extension pipes were to be mounted between the flanges. After bolting all flanges together, the platforms would be safe again. The four-day lift was completed in August 1987. A total of 108 hydraulic cylinders were synchronised with an allowable tolerance of plus or minus 3mm. During the welding of the flanges to the legs, which took 38 hours, these hydraulic cylinders took over the entire load. The total lifting capacity of all these cylinders was approximately 40,000 tonnes. It was included in *The Guinness book of World Records* as being the largest and heaviest of jack-up lifts.

## Small spill, huge consequences

Another disaster which was to have a huge impact on the shipping industry occurred in Alaska. As mentioned in the previous chapter, oil was discovered on the North Slope of Alaska. The Alyeska pipeline transferred the oil to the largely ice-free waters of Valdez, east of Anchorage. The US oil company Exxon had built a series of US-flag shuttle tankers in San Diego. This class of ship was built in the mid-1980s and had a deadweight of about 214,000 tonnes.

On the 24th March 1989, one of these ships, the *Exxon Valdez*, sailed from Valdez down Prince William Sound en-route to Long Beach, California. During its passage, the officer of the watch missed a course alteration and the ship ran aground at 16 knots on the Bligh Reef. The vessel was only single skinned and did not have a double bottom. The grounding led to a huge oil spill which devastated local wildlife.

Because it was such a high profile oil spill and was widely reported in graphic detail by the media, its importance far outweighed its size. Images of struggling wildlife trying to survive in a sea of black gunge were flashed to people's sitting rooms around the world. The following box shows the largest oil spills from tankers and the position of the *Exxon Valdez* in this league table.

| | Date | Ship's Name | Oil Spilt (metric tonnes) |
|---|---|---|---|
| 1 | 1979 | *Atlantic Empress* | 287,000 |
| 2 | 1991 | *ABT Summer* | 260,000 |
| 3 | 1983 | *Castillo de Bellver* | 252,000 |
| 4 | 1978 | *Amoco Cadiz* | 223,000 |
| 5 | 1991 | *Haven* | 144,000 |
| 6 | 1988 | *Odyssey* | 132,000 |
| 7 | 1967 | *Torrey Canyon* | 119,000 |
| 8 | 1972 | *Sea Star* | 115,000 |
| 9 | 1980 | *Irenes Serenade* | 100,000 |
| 10 | 1976 | *Urquiola* | 100,000 |
| 11 | 1977 | *Hawaiian Patriot* | 95,000 |
| 12 | 1979 | *Independenta* | 94,000 |
| 13 | 1975 | *Jakob Maersk* | 88,000 |
| 14 | 1993 | *Braer* | 85,000 |
| 15 | 1992 | *Aegean Sea* | 74,000 |
| 16 | 1996 | *Sea Empress* | 72,000 |
| 17 | 1989 | *Khark 5* | 70,000 |
| 18 | 1985 | *Nova* | 70,000 |
| 19 | 1992 | *Katina P* | 67,000 |
| 20 | 2002 | *Prestige* | 63,000 |
| 35 | 1989 | *Exxon Valdez* | 37,000 |

Current level 2017 Seven oil spills About 7,000 tonnes

*Figures from ITOPF*

The *Exxon Valdez* oil spill led to a huge rethink of tanker design. It also led to protective legislation in the USA in the form of the Oil Pollution Act 1990 (OPA 90). But this took until the beginning of the next decade, so more on this in the next chapter.

## Shipping families

The eighties saw the rise of many shipping dynasties. Tung Chao Yung, better known as C Y Tung, was born in 1912 in Ningbo in China. His natural political affiliation was with the Kuomintang who fled from China to the island fortress of Taiwan. In order to preserve his assets he bought ships. By this strategy, he kept his assets afloat and out of reach of the Chinese communists. This was a highly successful move and he was able to build his shipping empire into one of the largest in the world and based his operation in Hong Kong. When the container revolution got under way, he founded the Orient Overseas Container Line (OOCL), which became one of the largest box fleets in the world. He died in 1982, but his son, Tung Chee Hwa, or C H Tung, continued the expansion through the 1980s. He later became the chief executive of Hong Kong after handover in 1997.

Another Chinese shipping giant who moved from Ningbo to Hong Kong was Pau Yue Kong, or Sir Y K Pau as he was later known. Although unfamiliar with shipping – his family business was shoemaking – Pau quickly mastered the industry and at one time operated the largest fleet in the world. He died in September 1991, aged 72.

Wah Kwong was a further company which flourished in the Fragrant Harbour which Hong Kong translates into. The founder of Wah Kwong, T Y Chao, graduated from Soochow University in Shanghai in 1934 with a law degree. Instead of pursuing a legal career, he became a comprador in a reputable trading firm in Shanghai. T Y Chao's first venture into shipping comprised a 50% ownership of the 6,000-dwt cargo ship, *Kwok Sing*, which carried coal along the Chinese coast.

**Sabrina Chao, the current chairman of Wah Kwong**

In 1948, the political warfare in China compelled T Y Chao and his family to leave Shanghai aboard the Kwok Sing and sail for Hong Kong. Encouraged by his initial foray into shipping, T Y Chao established a new shipping company with two other partners which thrived. In 1952 the partners amicably divided the business and Wah Kwong was established. In the 1960s, his sons, George and Frank, joined the company. This passing on of the shipping legacy continues today. T Y Chao's granddaughter, Sabrina, was appointed chairman in 2013.

## Conclusion

In the eighties we saw the supremacy of Japanese shipbuilding being challenged by South Korea and other Far Eastern countries. The dry bulk sector saw a slump with Sanko trying to outbuild the market; it failed. The ship management idea grew and container trades flourished. On the political side, Iran and Iraq were at each other's throats which attracted peripheral damage to tanker trades, and the PLF hijacked the *Achille Lauro*. In terms of safety, attention was drawn to the vulnerability of bulkers. Oil spills were narrowly avoided in North Sea's Ekofisk field, but caused havoc in Alaska. This decade saw the rise and rise of Hong Kong Chinese shipowners.

It will be seen how the deeds and misdeeds of the eighties were dealt with and legislated against in the next chapter.

# Chapter Six – The Nineties

In the previous chapter, we saw the dismay that was caused when the officer of the watch on duty on the tanker *Exxon Valdez*, Gregory Cousins, missed a course alteration and ran his ship aground in Alaska. Although it only took 35th place in the pollution hall of infamy, it created a furore in the media and among politicians. There was cross-party support at Capitol Hill for tougher legislation to prevent any further such incidents. It was named the US Oil Pollution Act of 1990 and was generally referred to as OPA 90.

**The oil spill from the *Exxon Valdez* devastated local wildlife**

It was signed into law and became effective on the 18th August 1990, only 18 months after the Alaska disaster; a somewhat speedy passage for a US bill. Its main and immediate effect was to identify who was the beneficial owner of any ship visiting the USA. It also required the owners to lodge a bond with the US Coastguard and be issued with a certificate of financial responsibility (COFR). It caused to be established a contact who would be available and who would take personal control on the owner's behalf. This ensured that if any pollution was caused, the beneficial owner could be pursued through the responsible contact for compensation and clean-up costs. It also ensured that an owner could not reduce his liability by hiding behind an ownership represented, for instance, by a brass plaque on a lawyer's office wall in Panama City or Monrovia.

Some owners who were identified as the beneficial owner of a number or a fleet of ships, chose not to trade with the USA. They could be personally pursued by the US Coastguard and have any of their fleet arrested and sold to raise the compensation and associated costs. And such an unlimited financial price would be too high to pay and could financially wipe out the owner and all his family members.

The longer-term effect was to introduce double-hull tankers. OPA 90's requirements triggered urgent and serious discussions within the International Maritime Organization. This led to a game-changing revision of MARPOL. It was amended in 1992 to cover tankers of 5,000-dwt and above. It stipulated that these classes of vessels ordered after the 6th July 1993 must be fitted with double hulls. This meant that there must be a space between the cargo compartment and the open sea. In the case of a collision or grounding, there would be a barrier to reduce the danger of pollution.

The average cost of rehabilitating a seal after the *Exxon Valdez* oil spill was $80,000. At a special ceremony, two of these most expensively saved animals were being released back into the wild amid cheers and applause from onlookers. As if playing to the gallery, the marine mammals flopped and rolled in that funny way they have and progressed down a slope. They looked sleek and shiny, their whiskers bristling and noses sniffing the free and stimulating fresh air. A minute later, in full view of the spectators, a small pod of killer whales ate them both.

## Oil spillage does not stop

In an interview with the shipowner John Fredriksen, he discussed one of the worst moments in his life.

Occasionally, serious accidents send the media into a frenzy. Such an incident happened in west Wales in 1996. Before then, Fredriksen's hair used to be blonde but now it is not.

"It turned white almost overnight," he confided, "after *Sea Empress* ran aground in Milford Haven."

The call came through at 8pm as he was sitting down for dinner. No one got much sleep for a long time after that. The tanker spilled about 72,000 tonnes of crude oil onto the coastline. The Milford Haven Port Authority was full of praise for the work that Frontline and Acomarit, the ship management company, carried out.

Some three months earlier, towards the end of October 1995, the double-bottom tanker *Borga* had grounded in Milford Haven, despite having bow and stern thrusters and a controllable pitch propeller: Milford is not the easiest of ports to enter.

The owners of the *Sea Empress*, and especially Peter Cooney of the ship management company, went more than the extra mile in assisting to solve this most difficult of problems. And lessons have been learnt on both sides. Milford Haven is set in the only coastal National Park in the UK. This means it has a lot to protect and extra tugs, extra pilots and extra training have all been introduced.

In the tanker sector, double-hull units are much the preferred method of transporting crude oil. And over a short period of time, most of Fredriksen's fleet was double hull, with the singles being withdrawn and either sold or converted. But he had one or two doubts.

"If the *Sea Empress* had been double hull, perhaps some of the steel internals rubbing together might have caused sparks during the accident. A huge fire or explosion may have caused many casualties," he pondered. But he concedes that this is just speculation.

In the *Borga*'s case, the ship's hull was breached, but there was no oil pollution. Thus the decision that all tankers ordered after 1993 should be double hulled was fully justified. After all, a 72,000-tonne oil spill compared with zero pollution establishes a solid gold case.

Other tanker disasters also occurred around this time. The *Prestige* developed hull cracks off western Europe. The Spanish authorities were unable to agree to a port of refuge for the ship which was leaking oil. It was kept waiting off the coast of Galicia for six days. After that time, the ship broke in two and thousands of tonnes of oil polluted the Spanish shoreline. The judge blamed the disaster on a structural fault of the ship due to "deficient maintenance and upkeep checks".

**Substandard tanker *Prestige*, broke in two off Spain**

In December 1999, another sub-standard and poorly maintained tanker, owned by an Italian shipowner, was hit by a storm in the Bay of Biscay. The 1974-built, 37,000-dwt *Erika* had loaded in Dunkirk and was heading towards the Mediterranean. The storm took its toll and the ship started to take on water. Eventually it sank causing pollution all down the Atlantic coast of France from Brest to Biarritz. The cargo had been a particularly nasty and persistent grade of fuel oil and ironic graffiti proliferated in coastal France. "Merci *Erika*" !!

## Inspection regime comes to power

After the *Prestige* and the *Erika* disasters, the industry set up an inspection regime. Charterers would send teams to the tankers they had taken in the past or were likely to take on charter in the future. Thus a ship would earn an approval from the major oil companies and oil traders. A ship would have been described as Shell-approved, Exxon-approved or BP-approved. After all, a ship chartered by an oil trader might attempt to sell the cargo to BP for discharge at one of its installations. If the ship was not BP-approved, the sale might fall through.

More recently, the industry has streamlined the process so that tankers have a continuous approval regime. Two inspection regimes are pre-eminent, the Ship Inspection Report Programme (SIRE) and Chemical Distribution Industry (CDI).

SIRE inspections are commissioned by oil companies that are members of the Oil Companies International Marine Forum (OCIMF). Reports of these inspections are maintained on the OCIMF database for members to access, providing them with an up-to-date inspection status of the vessel.

CDI is a similar organisation designed for chemical and gas tankers, and the completed report provides a score for the inspected vessel.

Thus charterers with cargoes to move look at the ships that are offered to them and would check the SIRE or CDI reports to ensure that the quality of tonnage employed is of the highest order.

During the 1990s there was a huge increase in the loss of dry cargo bulk carriers. The vast majority of these ships suffered from structural failures. Associated with these losses were the deaths of hundreds of seafarers. There was increasing pressure on flag states through the intervention of the IMO to deal with the problem. It was recognised that different sets of construction rules were laid down by separate classification societies.

The IMO requested that the societies band together to produce common construction rules. A team of three classification societies formulated the rules for bulk carriers while a second group developed regulations for oil tankers. These were then agreed by the IMO and put before the whole of the International Association of Classification Societies (IACS). They were then fine-tuned by the societies as a goal-based enterprise.

The same procedure was also adopted for tank coatings as it was recognised that some compartments in ships were rarely looked at and, being ‘out of sight, out of mind’ meant that severe corrosion could take place. This was especially relevant in ballast tanks which were attacked by salt water, by humidity, by heat, especially in the tropics, and they suffered from a lack of inspection. The philosophy behind goal-based standards for bulk carriers and oil tankers is that ships should be designed and constructed for a specified design life and that, if properly operated and maintained, they should remain safe and environmentally friendly throughout their service life.

Starting work in the 1990s, it would be well into the next decade before the Common Structural Rules (CSRs) were made mandatory: But more on this subject in the next chapter.

## KS raises money and fleet sizes

Shipping has always looked for new and innovative ways to finance its ships. The main aim was to produce off-balance sheet financing. The Norwegians developed the Norwegian Limited Partnership or Kommandittselskap (KS). Under the Norwegian Companies Act (NCA), the KS must comprise one general partner or komplementaren and several limited partners. The general partner must hold 10% or more of the KS and would have unlimited liability towards the company's creditors. The limited partner's responsibilities are less onerous and are limited to each partner's share of the total committed capital of the KS. But each holds a joint liability towards the KS if one of the other partners defaults on their obligations.

A KS is not subject to taxation but investors residing in Norway are liable to capital gains taxes. Deductions relating to limited partnership losses are restricted to the amount of each partner's committed capital. The arrangement is similar to a shipowner allowing some of his close friends to invest in his ships. This releases equity for the shipowner to commit for further expansion.

Loopholes in the country's tax system allowed for large deductions on an investor's tax return as a result of unrealistic depreciation schedules. Reform of the tax system in 1996 removed all but a few tax advantages for KS investors.

Another version of the system would be a shipowning company setting up a KS which is invested in by external investors. The ship is then commercially managed by the shipowning company and which takes a management fee. The investors then simply trust the management to provide them with a profit.

In another arrangement, a KS would buy one or more ships and bareboat charter them back to the seller. The KS management can then approach a number of banks and achieve a much higher gearing, thereby reducing the need for equity. Outside investors are then invited to participate in the venture.

Both types of arrangement allow a company to keep vessels on their books without any accompanying debt.

In Germany a similar shipping fund arrangement was introduced. These were called Kommanditgesellschaft or KG. KG funds were popular with Germans investing in different asset types for their tax advantages which were sometimes considerable.

Shipping KG funds raised €33.1 billion ($46.8 billion), mainly from private investors, between 1992 and 2008 and long delivered consistent returns. They concentrated heavily on container ships and managed a large percentage of the world's fleet.

## Transoceanic communications

International communications in the 20th century increased in efficiency by leaps and bounds. Initially, Morse code transmissions led the way and so-called cables or telegrams were the norm. But after Italian inventor's Gugglielmo Marconi's pioneering experiments with radio waves at the turn of the century, there was a push towards voice transmission. Internationally, voice transmissions by telephone slowly gained in popularity, but it wasn't until the second half of the 20th century that international telephone calls became a normal part of people's lives, both in a private sense and in business.

The ability to talk across oceans was only possible because of a fairly anonymous group of ships. These were called cable ships. Those who are widely travelled might have seen these ships anchored off ports such as Singapore, Fiji and Bermuda. They were generally painted white and had a large amount of accommodation and looked like large yachts. The main clue to their occupation was a large roller sheave at bow and stern which enabled them to both lay trans-oceanic cables and to maintain them. Early cables were of copper with heavy insulation. The number of telephone conversations they could transmit was limited. But as the science of voice transmission grew, they increased in capacity. It was only after the introduction of lasers and high-powered computers that voice traffic took off.

Fibre optics had been around for quite some time, but the firing of laser beams down them was a new phenomena. Eventually, and with physics leading the way, it was possible for these laser beams to carry voice and data traffic over hundreds and then thousands of miles. The first international fibre optic cable was laid between the United Kingdom and the USA with a spur to Ireland in 1989. It became fully operational in 1990. It was a huge leap in technology being able to carry 40,000 simultaneous telephone conversations. Later cables carried even more traffic with eight fibre pairs carrying 100,000 telephone conversations at the same time. During the 1990s these cables girdled the globe, mostly laid and maintained by these little white yacht-like ships. But they are a bit like swans; they glide across the water with great elegance, but have enormous power hidden inside their graceful exteriors.

**Cable ships are powerful vessels capable of handling enormous cable weights**

Buried in their hulls is powerful machinery to handle enormous cable weights. There is also the electronic ability to hook up to subsea cables, cut them and test back to shore to find faults. The large amount of accommodation is there to house a number of cable engineers and technicians as well as sailors to handle the cables. All this cable work in the 1990s enabled global voice traffic. For example, a farmer in the distant outback of Australia was able to pick up his phone and dial a number in Rome, New York, London or virtually anywhere. This was a concept much sought after in previous decades when international telephone calls, which carried the name trunk calls, had to be booked through a telephone operator hours or even days in advance.

## Larger and faster ships

The trend in the 1990s was to build larger and larger container ships. It was thought that the Panamax size of about 4,500 teu would be the limit. But in 1996, AP Møller took delivery of the 6,400-teu *Regina Maersk*, one of the first so-called post-Panamax container ships. This was followed the next year by the 8,100 teu ships, the *Susan Maersk*. Such a ship could carry nearly 50 times more cargo than the post-war tweendeckers, described in *Chapter Two*.

In the 1980s, it had been recognised that engines would have to be developed for these larger ships. Japanese engine builders collaborated with the likes of Sulzer, MAN and B&W in Europe to design diesels with higher and higher outputs.

By the 1990s, the power had increased to as much as 70,000 brake horsepower (bhp). But this in itself caused problems. Some ships had top speeds of 28 knots; Maersk Line's *Maersk Baltimore*, *Maersk Boston* and their sister ships were examples. Therefore, when the engine revolutions were reduced to dead slow during manoeuvring, the ship's speed was still seven or eight knots. This was a much higher speed than the limits almost universally imposed within port limits. But if the engine was stopped, the rudder lost much of its influence and accurate steering was a problem. Ships were fitted with bow thrusters and, in some cases, stern thrusters, but these were only effective up to about three knots. Tug assistance was therefore necessary earlier in a ship's inward passage and for longer in its outward.

In these days of increasingly larger ships, some shipowners were guilty of a form of blackmail. They told the port authorities that although their port infrastructure was fine for Panamax container ships, they would not be suitable for larger units. This referred to the outreach of the container cranes. Panamax box ships have a maximum beam of 32.31m. This equates to 13 standard containers across the ship. But the new vessels on order had as many as 15 or 16 boxes across; the cranes were unable to reach the outermost ones.

The major ports, anxious for the large container shipowners' business, fell into line and increased their crane sizes. The initial enlarged outreach was generally accepted as 18 boxes across. No one could foresee box ships getting any larger; although there must have been initial drawings from naval architects at this stage, no newbuilding orders had been placed.

The reason for owners to look at larger sized units was the rise and rise of China as a manufacturing base. And although China is a very rich country, it is full of very poor people. But in the 1990s, this began to change. Whereas most of the population were the workers, there began to emerge a middle-class element. And in a country with more than 1.2 billion people, an emerging strata of people can quickly grow and demands for domestic goods, motorbikes, white goods, cars and suchlike can increase rapidly. This growth in the manufacturing sector is demonstrated in the country's oil consumption compared with Europe and the USA. 'Oil keeps the wheels of industry turning.'

**Thousands of bbls per day**

| Area | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | %'age |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Europe | 14,831 | 14,976 | 15,038 | 15,022 | 15,019 | 15,295 | 15,633 | 15,839 | 16,092 | 16,063 | 7.5% |
| USA | 16,580 | 16,713 | 17,033 | 17,236 | 17,719 | 17,725 | 18,309 | 18,621 | 18,917 | 19,519 | 15% |
| World | 66,100 | 66,331 | 66,972 | 66,671 | 68,058 | 69,195 | 72,692 | 72,496 | 72,815 | 74,495 | 11% |
| China | 2,200 | 2,411 | 2,913 | 3,145 | 3,390 | 3,672 | 3,935 | 4,147 | 4,416 | 4,985 | 56% |

*Source: BP Statistical Review of World Energy*

China was awakening, it was manufacturing, it had an increasing internal consumption: But most important of all, it was exporting. And much of its manufactured goods were being bought by Europeans. But the lion's share went to North America. As Graham Valentine, an economist working in Geneva, said to me in 1999: "This is all very well, Americans are buying. But what will happen when Americans stop buying?"

The answer to this question will be seen in the next chapter.

## Conclusion

The nineties saw an increase in legislation in the fight against oil pollution. This was led by the USA but was followed by the international muscle of the International Maritime Organization (IMO) whose motto is safer ships, cleaner seas.

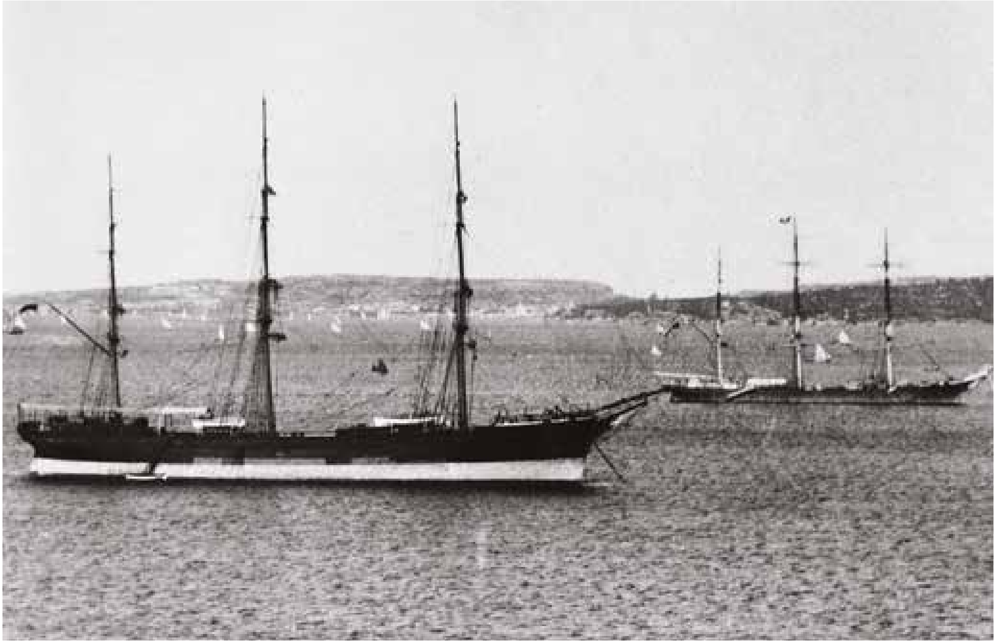
The nineties saw trade between China and the rest of the world increasing. This triggered the desire by shipowners to again attempt economies of scale by building larger and larger ships. Engine builders were therefore tasked with developing more powerful engines and port authorities to erect bigger and deeper port facilities and install larger cranes.

Novel ways were developed to provide shipping companies with off-balance-sheet financing. Part of this was the Norwegian KS arrangements and the German KG system. But would these stand the test of time? It is only time that will decide.

# Chapter Seven – The Noughties

Now we have crossed the line from the 20th Century to the 21st, it would be instructive to look at seafaring 100 years ago. Although steamships were prevalent, sailing vessels were still widely traded. The main bulk trades in those days were grain and nitrates; the former from the USA, Canada and Australia and the latter from Chile.

For Australia and Chile, sailing ships were remarkably effective; they loaded out of minor ports, especially grain from Australian ports. A sailing ship would take three months to sail from Europe via the Cape of Good Hope, along the Roaring Forties, to Australia. There was no such thing as water ballast a hundred years ago. A sailing ship would have loaded between 1,000 and 2,000 tonnes of builder's rubble in Europe. After arrival in Australia, it would take two or three weeks of back-breaking toil to discharge such ballast. With clean holds, the ship would be loaded with bagged grain, an operation which would take a further two months.



**Typical sailing ship from 100 years ago**

Getting back to Europe in a laden condition via Cape Horn would take a further three months. The ship would be laid up for the rest of the year: So now the finances.

Monthly running costs would be about £400, including drydocking. Crews were cheap. The master would earn £10-12 per month, an able seaman less than £2, an apprentice less than £1; the whole crew would cost less than £100 per month with a sailor being fed for about one shilling a day. Food and stores would amount to about £1,000. Port dues, towage, pilotage and agency fees would be around £4,000 both ends.

With freight at about thirty shillings per long ton and the ship worth about £5,000, an efficient ship could clear £1,500 per year: The ship would have paid for itself in two or three voyages. But it was a tough life on board.

The tallest masts rose more than 60m above the main deck and must be climbed quickly and repeatedly in any weather at any time of the day or night. To provide some idea of the movement at the masthead, one could look at a modern container ship. Rolling at 30°, the bridge would move through an arc of 75m. Aloft on a sailing ship, with few handholds, would be exceptionally dangerous; an experience through which many did not survive. There were no dry areas on the ship for clothes, no hot food in rough weather, no shelter on decks which were mainly awash. A sailor might spend six weeks to two and a half months wet through and cold on a round voyage: The Roaring Forties were very unforgiving.

How things have changed in 100 years.

## International legal pressure on shipping

This decade became one where legislation, debated and agreed in the previous millennium, became law.

MARPOL Annex ll was incorporated to include vegetable oil cargoes and entered into force in 2007. Until that time, any tanker could carry vegetable oils. These included, but were not restricted to, substances such as palm oil, sunflower seed oil, and rape seed oil, and are loosely defined as triglycerides, extracted from a plant and liquid at ambient temperature.

But Annex ll went a lot further in protecting the marine environment. It banned quantities of noxious liquid substances which, if discharged into the sea from tank cleaning or deballasting, were deemed to present a major hazard to either marine resources or human health and therefore justified the prohibition of the discharge into a marine environment. In cases of harmful chemicals, these had to be discharged ashore. With less noxious cargoes, in many cases overside disposal amounts of these were reduced from 2-300 litres down to less than 75 litres.

## Safe ships, clean seas and aliens have landed

But tanker cargoes were not the only subjects covered by MARPOL in that year. It increased protection for Particularly Sensitive Sea Areas (PSSA). There are restrictions on what traffic can pass through or near these areas. Included on the list are the Galapagos Islands in the Pacific, the Florida Keys, the Torres Strait and the Great Barrier Reef in Australia;

also, marine reserves such as the Papahánaumokuákea Marine National Monument in Hawaii and the Paraças National Reserve, near Lima in Peru.

The Marine Environment Protection Committee (MEPC) within the IMO also made a start on the difficult subject of invasive and alien species in ballast water. To those not aware of the problem, a ship might sail from Europe to North America in ballast. That is to say that, before it sails for the Americas, it takes on overside water in its ballast tanks to increase the ship's draught. This makes the ship more seaworthy and submerges the propeller deeper in the water. A vessel may take on 25-30% of its cargo-carrying capacity in ballast water.

For a Panamax bulk carrier, this may be as much as 30,000 tonnes of overside water which might contain any number of foreign organisms including minute creatures, larvae and eggs. Before loading, this ballast water is discharged into the sea or river on the other side of the ocean, where the ship will load.

**An invasive species such as the zebra mussel causes billions of dollars of damage**

An example of the problem is the Zebra mussel. It invaded the Great Lakes from the Black Sea and the governments of both Canada and the USA spend billions of dollars trying to clear thousands of cooling water intakes and outlets, blocked by mussel infestations. Power stations, lakeside manufacturing facilities and water treatment plants are among the affected utilities.

Other species include the green crab (carcinus maenas); this European crab has been carried by ships in ballast water and is sold as fish bait in much of the world.

Killer Algae (Caulerpa taxifolia) has taken over from native species in many parts of the world and has altered the eco-balance. The sea walnut (Mnemiopsis leidyi) is a jellyfish which feeds on plankton and competes with native fish for food. The veined rapa whelk (rapana venosa) is a predator of bivalve molluscs and has upset the balance of nature.

One temporary solution in reducing invasive species in ballast water is mid-ocean ballast exchange. A ship will discharge its ballast water tank by tank and far from land. After each tank is emptied, it will refill each tank in the middle of the ocean from seawater less likely to contain foreign organisms. But there are serious risks involved in conducting such an exercise.

The car carrier, *Cougar Ace*, suffered an acute loss of stability in the Pacific in July 2006. This was thought to have been caused by emptying too many ballast water tanks for the safety of the ship. There was a lack of stability through the free-surface effect of partially empty tanks and the vessel tipped over to its angle of loll.

**Mid-ocean ballast exchange was thought to have threatened the very existence of this car carrier, *Cougar Ace* and its crew**

Treating ballast water itself was also discussed by MEPC. Gamma radiation was one proposed solution as well as heat treatment.

## Container losses

It has to be said here that the IMO has always worked hard to solve all the issues and problems that commercial shipping causes for the marine environment. Firm leadership from various secretaries-general has to be highlighted here. Among these are William O'Neil from Canada in the 1990s and Efthimios E. Mitropoulos from Greece who took over in 2003. It must also be pointed out that the IMO, based in London, is the most effective arm of the United Nations and by a seriously long way. The shipping industry is fortunate to have such guardian angels looking over it.

One thing not touched upon in this chapter so far is the container sector.

In March 2009, the Office of National Marine Sanctuaries, an agency within the US Department of Commerce called the National Oceanic and Atmospheric Administration (NOAA), published a far-reaching report on the loss of shipping containers around the world. It makes alarming reading.

The report points out that marine containerised trade grew eightfold from 1985 to 2007. Globally there were between five and six million containers carried on ships at any given moment. But what must cause the greatest concern is that an estimated 10,000 shipping containers fall overboard from ships every year.

The reason for these losses varies. Some are caused by poor lashings or faulty securing systems. Rough weather is also a prime factor. Container weights are also miscalculated when a ship is being loaded. The latter was a contributory factor in the loss of the *MSC Napoli* off the Devon coast in 2007. This 1991-built ship, of 4,419-teu container capacity, developed cracks in its hull and decks. About one-fifth of the 660 containers on its deck were found to be heavier than their declared weights, some by as much as 20 metric tonnes. In normal situations, it would be obvious that a laden container would sink as soon as it hit the water. But this is not necessarily the case. The report suggests that: 'Following loss incidents, containers rarely sink immediately.'

Depending on whether they are full or empty, and on the nature of the cargo inside, containers may float at the surface for several days or weeks prior to sinking. Containers are not generally entirely watertight; while an empty container is likely to sink due to water ingress, a full container will likely float until air trapped within the cargo has escaped.

Calculations have been made as to the weight to which a container needs to reach to sink in sea water. A 20ft container would have to exceed 16 tonnes before it sank, and a 40ft container would have to weigh more than 32 tonnes.

This means that both sizes of container will assuredly be lying, barely afloat, in the major shipping lanes.

The problem is growing because ship sizes are increasing. As each generation of ship becomes larger, the stacks of containers grow taller. At the moment, the average Panamax container ship is 5,000 teu. But since the Panama Canal expansion project was completed in 2016, the canal is able to handle post-Panamax container vessels that can carry more than 12,000-teu. And these will not be as large as the latest generation of Malaccamax ships designed for transiting the 25m deep Straits of Malacca. These have a capacity in excess of 18,000 teu. If only a tiny fraction of these containers are lost, the totals are enormous. After all, they are stacked seven or eight high on the open deck.

In an open seaway in heavy seas, the ships, however large they are, move up and down significantly. The movements are more pronounced at the far extremities of the ship. The vertical rise and fall of the containers in these areas are similar to the unlocking forces used in allowing the containers to be lifted off the top of the stack by a dockside crane. Thus if the containers unlock in a seaway they are quite likely to be washed over the side. And it seems they are, in their thousands.

**Container ship *MSC Napoli* suffered severe hull cracks in 2007, probably caused by mis-described container weights**

Aside from the navigational hazards and the economic costs, the impact on the environment is significant. This report says that 10,000 lost containers equates to 41,500 tonnes of littered steel in container weight alone and ‘it is conceivable that 100,000 tonnes of substances in packaged form – many of which may be harmful – are falling off ships in containers each year.’

So what is the answer? Maritime and shipping organisations are looking at better stacking systems and procedures, more efficient ways of verifying container weights and methods of identifying lost containers. A proposal to the IMO a few years ago was to equip containers with a beacon. With technology that is miniaturising and getting cheaper all the time it’s possible that in future these man-made UFOs, (unidentified floating objects) could show up on an automatic identification system (AIS) receiver, like an aircraft’s black box.

## Passenger ships grow huge

This decade saw the introduction of larger and larger passenger ships or cruise liners. In two decades, the nineties and noughties, the largest class cruise ships have grown a third longer from 268m to 360m. The beam has almost doubled from 32.2m to 60.5m; they have doubled passenger numbers from 2,744 to 5,400. And finally, the gross tonnage, or interior space, has tripled from 73,000gt to 225,000gt. As they evolved, they went from verandas on a single deck to verandas on all decks for outboard cabins, and inboard cabins overlooking huge atria. During these years, the golden age of ocean liners slowly disappears while the golden age of cruise ships may well be these two decades and years to come.

**2004-built, *Carnival Valor* has accommodation for 3,000 passengers and 1,200 crew**

During the first 10 years of this century, 203 cruiseships were built but very few were scrapped. Thus the number in operation is probably close to 500. Cruising is very much a 'people' thing. In marketing terms, it takes five people to praise something to counteract just one person who denigrates it.

In terms of cruising with a mega-cruise liner taking 5,000 passengers, the operator has to make it a thoroughly enjoyable experience for at least 4,000 of them, or passenger lists will shrink.

With the enlargement of the cruising fleet came the growth in social media. A tweet about facilities aboard a ship may go viral. If the tweet is positive, all well and good: If it is negative, not only will it be more widespread, people are more likely to spread bad news. This will seriously affect the 'shall I? shan't I?' waverers who have yet to decide whether to cruise or not.

There is also the matter of safety on board these huge ships. Under the Safety of Life at Sea (SOLAS) regulations, whose amendments came into force in July 2008, passengers must be evacuated within 30 minutes. This is half an hour from the time all the passengers and crew are at their muster stations until the time they are clear of the ship.

Time for reaching muster stations has been estimated as between 30 and 40 minutes from the time the abandon ship order has been given.

Most people will form an orderly queue without panicking, but there are always those who are more prone to slight hysteria than others. And positive steps to breathe deeply and slow one's heart rate down, as well as fighting the urge to panic, is difficult for some people. Also, many people in the twilight of their years decide to spend their children's inheritance on a trip on a cruise ship. People with walking sticks, Zimmer frames and wheelchairs do not mix well with more mobile passengers.

It was to be physically proven in the next decade that a timeframe of five or six times the SOLAS estimate paints a more realistic picture: But more of that in the next chapter.

## Box ships also grow big

As these giants grew, so other classes of ships imposed themselves upon a market which was less than ready for them. In previous decades, container trades happily existed with Panamax tonnage at 32.2m beam or 13 containers across. And while larger ships were gradually introduced, wholesale expansion of port reception facilities was not required. In fact, A P Møller produced the *Sovereign Maersk* of 8,000 teu, then the longest ship in the world at 346m length overall (LOA). This meant that the outreach of container cranes, capable of 13 container widths, was still respected.

But in 2006, Møller announced the imminent delivery of the *Emma Maersk*, described as 11,000 teu. News of this new ship had been rumoured for many months. A propeller manufacturer in Germany let it slip that they were producing the largest ship's propeller ever built. Wartsila-Sulzer was reported to be producing a diesel main engine of close to 110,000 bhp.


**Ground breaking designs brought container trades into undreamt-of regions; here is one of the pioneers, *Edith Maersk* of 15,000 teu**

After the vessel entered service, it was clear that the ship, at 396m LOA and 21 containers across, would require port authorities to install container cranes with an outreach of more than 170ft. It was also apparent that, rather than a nominal 11,000-teu, this ship and its sisters would be capable of loading more than 15,000-teu. This was a game changer. One of the eight sister ships, the *Ebba Maersk*, holds the class record at 15,011-teu.

It was also a challenge for pilots. As mentioned in the last chapter, ships with hugely powerful diesel engines are difficult to manoeuvre at slow speeds, so pilots have a rather hard task in berthing and unberthing these monsters.

And the monsters are growing bigger. By the end of this decade, some 20 ships larger than the A P Møller 'E' class were being considered by the market leaders, Mediterranean Shipping Company (MSC) of Switzerland and CMA CGM of France. MSC, for instance, were planning a 13,000-teu class for delivery in the next decade.


**By the end of the decade, other major players in the box ship trades were planning monster ships. An example is the *MSC Regulus* of 13,100 teu**

And ports on the Far East to Europe trade were expected to plan ahead to accept ships of up to 23 containers across.

## Large ships also hit by storms

There is a misconception that a ship and its seafarers are safer, the larger the ship.

It has been said that the North Atlantic was really bad for rough weather, but it is small fry when compared with Cape Coast storms. The Cape of Good Hope used to be called the Cape of Storms, but the name deterred seafarers from rounding it, so they changed its name. But changing the name did nothing to calm the winds and the waves in the area.

A maritime expert investigated the damage to a Capesize bulk carrier that was 'pooped' by huge waves off the coast of South Africa. The wave came over the poopdeck of the *Bet Commander* in June 2009. It took out five cabins on the 3rd deck above the afterdeck. It also ripped off the vents to the steering flat, flooding that space and taking out the steering motors.

The top of the wave continued upwards to allow water to surge into the engine room via the vents on the funnel deck about 23metres above sea level. And even higher up, water flooded into the bridge through the side doors which were at 27m high. All the whip aerials on the after end of the bridge wings were bent forward.

Fortunately the crew were very resourceful and managed to get one steering pump working so they were able to steer the vessel. But the ship was steered from the emergency steering position in the steering flat through messages passed from the bridge.

With a tug on standby the vessel limped into Algoa Bay where the casualty was investigated. The crew in those after cabins were very shaken as they were effectively washed out of their beds. When the engine room crew saw water coming through the funnel vents they presumed the worst and that they were sinking, especially when the flooded steering flat alarms all sounded.

Life at sea is not for the faint-hearted even when one is sailing on a Capesize bulk carrier.

## Nationalities

One of the things that was becoming clear after the turn of the century was the multi-national profile of ships' crews. One master who commanded ships in this decade bemoaned the fact that his English language, his native tongue, was immeasurably better than crew who worked watches on the bridge, not only lookouts, but officers.

"Days when starboard or port was starboard or port are long gone," he said, "Now they have become some totally mumbled, and misunderstood Hindi, Estonian, Lithuanian, Croatian, Malay, Indonesian, Polish, Filipino, Slovakian, Bulgarian, Romanian, Iranian, Ukrainian or Pakistani variant."

"On the last diving support vessel (DSV) of which I was in command," he went on, "there were 80 crew members on board. These comprised 17 different nationalities, not including American, Scottish and Irish."

Winston Churchill said that "Great Britain and the United States of America were two countries, separated by a common language." On board ships in recent years, one could have 20 nationalities separated by the English language. One shudders to think how many different nationalities are represented on a large cruise ship employing 2,000 crew members.

Larger designs were not restricted to cruise liners in the first 10 years of the new century. As discussed, plans were already afoot for large container ships. Tankers had already reached their nadir in terms of size. The industry had previously experimented with crude carriers in excess of half a million tonnes deadweight. But trades for which they might be suited were limited. The single buoy mooring (SBM) in the US Gulf, the Louisiana offshore oil port (LOOP) was the only place in North America to accept them. They were too deep for the English Channel and the Malacca Straits; the Suez Canal was too shallow. So all things considered they were of little use.

The oil industry settled on vessels of about 320,000-dwt as the ideal size of large crude carriers. They were able to lift 2 million US barrels of oil, whether it was light, medium or heavy with a little room to spare. Apart from a handful, all ships larger than this were withdrawn from trade or converted into storage vessels.

That left bulk carriers as a type of sector not addressed. The accepted size was about 180,000-dwt. These were an acceptable size for most ore trades. They traded to major areas such as Brazil, Western Europe, Japan, Korea, Australia and China. They could also visit smaller exporters such as Canada, Chile and South Africa.

Some dedicated trades were able to accept larger ships of up to 250,000-dwt and a suitable number of vessels were built accordingly.

But, towards the end of 2007, the financial crisis in the world made its presence felt. And, in 2008, it spilt over into the shipping industry. The price of iron ore commenced a steady decline. Chinese domestic iron ore was of poor quality; all the good stuff had already been used up. The country's appetite for ore was insatiable and the main suppliers of the commodity were Brazil and Australia, but the latter had the advantage: it was closer.

**One of Australia's major iron ore exporting facility at Port Hedland in Western Australia**

Brazil to China represents a laden voyage of about 35 days, while from Australia the voyage is about 10 days. Therefore Australian suppliers could adjust their prices to make the delivered price of iron ore more competitive.

There were only two ways to make Brazilian prices more attractive. Either move Brazil closer to China or build huge ships to take advantage of economies of scale. So this is the solution that Brazil focused upon. It approached shipyards for designs of very large ore carriers (VLOCs). In 2008 the Brazilian mining giant placed an order for a dozen 400,000-dwt ore carriers with the Jiangsu Rongsheng Heavy Industries (RSHI) shipyard in China. It placed an order for a further seven with Daewoo Shipbuilding and Marine Engineering (DSME) in South Korea in 2009. But this was not the full extent of its plans. Bulk carrier owners were encouraged to place orders for similar sized ships with Vale taking them on long-term charter. Thus a further 16 ships were ordered. Therefore in the next decade, when the ships were due to be delivered, the bulk carrier trades were turned on their respective heads.

## Gas ships follow the growing trend

Natural gas was fast becoming a fuel of choice. Climate change was becoming a reality in many people's minds. The United Kingdom and many other countries had pursued a strategy involving a 'dash for gas'. Most LNG carriers had a capacity of about 150-160,000 cubic metres. But in 2005, a Qatari company, Qatar Gas Transport Company (Nakilat), backed by the government, contracted a series of much larger gas ships. They ordered sixteen 266,000 cubic metre vessels from Samsung and Daewoo in South Korea. They were delivered between 2007 and 2010.


**A new trend in vessel's size. Qatarmax at 266,000 cubic metres**

Although much larger than the previous generation, the owners claimed that they had a 40% lower fuel consumption and a similar reduction in emissions.

## Conclusion

We studied the costs of sailing ships in a period 100 years ago. This decade saw legislation negotiated in the 1990s enter into force. MEPC, an element within the IMO, sought to greatly improve the environment by cleaning ballast water and protecting particularly sensitive maritime areas. We studied lost containers washed overboard from box ships.

We looked at the enormous increase in cruise ship sizes and studied their disadvantages. We also looked at the sudden growth in the size of container ships, with the large ones doubling in size. A similar increase in size happened with ore carriers. We explain the reason why.

And LNG carriers follow the trend in upsizing.

## Chapter Eight – The Teens

There has been a rise in Chinese shipbuilding to overcapacity in this decade. In order to become the world's largest shipbuilding country, China used an age-old method to reach its goal. Some polite people call it undercutting, some call it dumping but what it really means is going to any length to steal business from the competition; in other words, price adjustment. This was Japan and South Korea. And it mainly worked. Only liquefied natural gas (LNG) carriers were left out of the loop. This was because potential buyers seemed to consider that Chinese yards would have been too technically challenged to offer a top-notch design and build. With running costs, including finance, at close to $80,000 per day and most vessels engaged on long-term charters, being off-hire would have been an expensive business.

### That herd instinct again

Everyone knows that shipowners have two weaknesses. They cannot resist following and copying what other owners are doing, and they have an irresistible urge to grab a bargain. And these really competitive prices from Chinese shipyards were too good to miss.

Thus during this decade no sector of the market, with perhaps the exception of LNG carriers, suffered from ruinous overtonnaging. And this severely affected incomes, especially in the dry bulk trades and the container sectors. Of course, this was not helped by corporate decisions. Maersk Line, the A P Møller's container sector, went for very large box ships. The foundations to this growth were laid in the previous decade, the eight 15,000-teu 'E'class caused the other big container lines to re-evaluate their own strategies. In the meantime, Maersk Line went one further in February and in June 2011. It ordered twenty 18,340-teu ships from Daewoo Shipbuilding in South Korea in two contracts worth $1.9 billion each.

The other two large container lines competed quickly. Mediterranean Shipping Company (MSC) brought in five under their houseflag while CMA CGM built nine. The Chinese are not slow in the competition game and China Shipping Container Lines (CSCL) contracted five. The Arabs are also tagging along behind the market leaders with one ship.

As this book goes to print two of the largest containership companies have placed orders for more mega-sized boxships; CMA CGM has ordered nine, while MSC has ordered 11, all of about 22,000-teu. This is in addition to the 80 container ships between 14,000 and 21,000 teu due to deliver into an already overtonnaged and unready market over the next two years. These are causing a cascade effect which sends the smaller and replaced ships competing and driving out even smaller ones and so on. Thus the whole market is unhealthily unbalanced and fighting for survival. And for every 100,000 teu capacity delivered, only 25,000 teu capacity will be scrapped.


**Kuwaiti flag ultra large container ship Barzan of 18,800-teu capacity**

And at the beginning of 2017, 250 container ships are laid up. They have a total capacity of more than 1,000,000-teu.

This growth in fleet size meant that the gauntlet had been thrown down and Japanese liner companies reacted to this damaging competition. The major players, NYK Line, Mitsui OSK Lines and Kawasaki Kisen Kaisha made moves to integrate their shipping businesses. They aimed to make a new joint venture to operate their combined fleets and global terminal companies. The intention is to become a stronger player in the liner trades where scale has become crucial to survival.

At the beginning of 2017, NYK operated 99 vessels, of which 45 were owned and 54 chartered. MOL had 79 vessels, 22 owned and 57 chartered, while K Line were responsible for 60 vessels, 12 owned and 48 chartered.

There is a downside in such an amalgamation. Each participant might face losses following any cancellation of contracts in order to return charter vessels to their owners ahead of schedule. Also, each company has its own IT sector to operate its fleets and schedule liftings and programme voyages, and there will be a choice as to which system to adopt and which to make redundant.

## Bulkers cascade as well

As with the container ship sector, there was a similar cascading effect taking place among bulk carriers, with the 400,000-dwt Valemax ships being delivered from the builder's yards. The first was delivered in 2011 and although one suffered severe shell plate damage caused perhaps through incorrect loading, poor design or sub-standard steel, the rest of the 35 initial series had been delivered by 2016. These ships replaced close to 100 traditional Capesize bulk carriers, bearing down quite heavily on freight rates.


**Italian-owned handysized bulk carrier *Four Otello*, 34,357-dwt. Built 2010**

Fortunately, there was loud opposition to these ships in China. One must bear in mind that many Capesize bulk carriers, whose livelihoods were being threatened by the introduction of these 'mega' ships, were Chinese owned or operated. The first ship, *Vale Brasil*, was bound for Dalien but was diverted when the ban on vessels above 300,000-dwt was implemented. The deadlock continued, but was occasionally relaxed, until July 2015 when China opened its doors, or rather its ports, to these ultra-large ships.

**Valemax bulker *Vale Rio de Janiero* fully laden with nearly 400,000 tonnes of iron ore on board**

Of course, by now, so long into the downturn, traditional owners were not themselves able to make the overtonnaged situation worse. They had depleted their reserves of cash to the extent that ordering fresh tonnage was out of the question. Thus the supply side had a self-regulating element in which it was reduced in size by the absence of finance.

But a further threat remained. Three Chinese corporations ordered a further 30 of these Valemax ships for delivery between 2017 and 2019. These will replace a further 80 Capes. It is expected therefore that many bulk carriers will enter lay-up until the market becomes more profitable.

## The lay-up option

In the shipping business it is reasonably easy to place container ships and bulk carriers into cold lay-up. This is when all the machinery is shut down and just a watchman placed on board in a safe anchorage. This compares with warm lay-up where some of the ship's equipment continues in operation and a skeleton crew resides onboard and the ship could re-enter service in short order.

In the tanker sector it is more problematic. After the *Prestige* and the *Erika* disasters, the industry set up an inspection regime. Charterers would send teams to the tankers they had taken in the past or were likely to take on charter in the future. Thus a ship would earn an 'approval' from the major oil companies and oil traders. A ship would have been described as Shell-approved or Exxon-approved. As mentioned in the previous chapter, a ship chartered by an oil trader might attempt to sell the cargo to BP for discharge at one of its installations. If the ship was not BP approved, the sale might fall down.

Therefore a tanker that ceases trading and is sent into lay-up cannot continue to be inspected. A ship attempting to re-enter the market after a long lay-up and with no recent approvals or inspections, might find it impossible to find employment.

The tanker market has not been too bad in this decade. But the shipowners' terminal complaint of not being able to resist what is perceived as a bargain in terms of newbuilding prices as discussed earlier, is coming back to haunt them.

In 2016, 63 new VLCCs were delivered as well as 95 MR (25-50,000 dwt) tankers. Up until the end of August only 27 VLCCs had been delivered and 66 MRs. So a further 36 VLCCs and 29 MRs came into the marketplace during the remainder of 2016. This bore down quite heavily on freight rates, where there was not enough available oil to employ all these tankers gagging for employment.

So as the lay-up option is not a viable alternative in the tanker world, there will be a history of poor earnings, perhaps for the rest of the decade.

## Highly qualified officers and crews become scarcer

As discussed in the previous chapter, the growth in both the fleet size and the individual size of cruise liners may pose a problem for passenger numbers; will there be enough seafaring guests to go around? As a 'people' industry, bad publicity is a calamity. And an individual disaster becomes a calamity for the whole industry.

And then the *Costa Concordia* disaster happened. The ship was seven years old and had cost more than half a billion dollars to build. On this particular voyage in early 2012, the **Cruise**

**ship wrecked by a 'reckless' Captain**

ship sailed from Civitavecchia, the port for Rome, heading for Savona and five further ports. As the ship approached the island of Giglio, off the West coast of Italy, the master, Captain Francesco Schettino, ordered an alteration of course to port. His intention was to sail closely past the island as a salute to an ex-employee who had retired there.

It was a clear but overcast night with calm seas. The captain misjudged his position and in attempting to get out of trouble, steered a course which took the ship over shallows littered with rocks like giant fangs. These tore a 50m gash in the port side which quickly flooded the engine room and adjoining compartments and crippled the ship.

The winds and currents drove the ship slowly to the west where it grounded close to the island's port. It came to rest on its starboard side in shelving and shallow waters of 20m depth and at an angle of about 70°. For some reason the order to abandon ship was not given for some time. And whereas SOLAS stipulates a time lapse of 60-80 minutes, from when the order to abandon ship has been given, for an evacuation to be completed, this took more than six hours for the 4,252 souls on board. Thirty-two persons died from eight

nations. In all, 43 nationalities were represented in the passenger list and 11 different nationalities within the crew.

The master was one of the first off the ship, claiming that he 'had fallen into a lifeboat'. Most former or current seafarers feel that he was being supremely economical with the truth.

The ship was salvaged over the next two and a half years and towed to Genoa for dismantling.

Captain Schettino was brought to trial. He was convicted of multiple manslaughter, of causing a maritime accident and of leaving his ship before all passengers and crew had been evacuated, in breach of the centuries-old sailors' code. In some ways, the owners must bear some of the blame. Schettino claimed that the helmsman, Jacob Rusli Bin, from Indonesia, did not have a sufficient grasp of English to obey the helm commands from the Master and officers. Perhaps the owners should not have penny-pinched in this department and should have employed a man, bilingual in English and Italian, rather than employing the cheapest of crews.

The captain's abandonment of the thousands in his charge resulted in him being called 'Captain Coward' by the international media, while prosecutors described him as 'a reckless'. He was sent to gaol for 16 years in 2016. This comprised 10 years for manslaughter, five years for causing a shipwreck and one year for abandoning his passengers.

At Schettino's trial, prosecutor Stefano Pizza stated, "The captain's duty to be the last person off the ship is not just an obligation dictated by ancient maritime rules, it is also a legal obligation intended to limit the damage to those on the ship."

The behaviour of Captain Karlsen of the *Flying Enterprise*, related in chapter two, should be an example to all ships' Masters.

## Black gold again

In this decade, oil emerged again as a political pawn, as it had in most previous decades. It had become such a cheap commodity that many producers required oil prices to be maintained at $100 per barrel or above. Many countries' budgets and fiscal policies were structured around such an income from oil. They were suffering hugely when it fell below $40. Saudi Arabia, the world's 'swing' producer and dominant force, kept its pumps going at full speed. Its intention was to make it unprofitable for the United States of America to become self-sufficient in energy and drive shale oil and gas producers out of business. The country had trillions of dollars in foreign reserves to fall back on; its budgets could always balance for many years to come.

In the end, the Organisation of Petroleum Exporting Countries (OPEC) forced the Saudis into a compromise, but oil prices only settled at between $50-60 per barrel. And behind the scenes, US producers were able to carry on developing their oilfields with the promise that the US strategic reserves would be replenished at an artificially high price.

But in the oil industry things have changed. The old 'seven sisters' still exist but when consolidation came to pass in the 1990s, seven became four and they then controlled less than a third of the world's oil. Now there is a more influential 'seven sisters'. This group comprises:

- Saudi Aramco (Saudi Arabia)
- China National Petroleum Corporation (China)
- Gazprom (Russia)
- National Iranian Oil Company (Iran)
- Petrobras (Brazil)
- PDVSA (Venezuela)
- Petronas (Malaysia)

**There are question marks over Saudi Arabia's output and reserves**

These state-controlled organisations control the majority of oil production and exports. These days, the old 'seven sisters' control only 10% of the world's production and 3% of its reserves.

Saudi Arabia's ambition has been tempered somewhat by the fiscal misery of some of its OPEC partners, but it is still there. Its aim is now to ramp up production through the 12.5 million barrels per day (bpd) towards 15 million bpd. But there is a cloud on the horizon. Every oilfield that ever existed has always hit a maximum yield and then production quickly fell away.

Oil and gas fields generally have a lifespan ranging from 15 to 30 years. This is measured from when the first oil is produced until the field is finally in serious decline. For larger fields, production can last for 50 years or more. Offshore fields are different. Deepwater discoveries are usually operated for between five and 10 years due to the very high extraction costs.

In April 2015, the Saudi oil minister, Ali Al-Naimi, made an important announcement. He stated that Saudi Arabia had produced 10.3 million bpd in March. This was the highest figure based on records going back to the early 1980s. The previous peak was in August 2013 at 10.2 million bpd. But some industry experts believe that the Saudi production had peaked back in 2008. The only way that production was going forward was steadily in a downwards direction; its public concession of reducing output to its OPEC partners disguised the real picture.

Leaked diplomatic cables released in 2011 suggested that not only is a decline in progress but that reserves are not as published. They revealed that a former vice-president of Saudi

Arabia's oil monopoly Saudi Aramco warned the United States of America that oil reserves in Saudi Arabia might in fact be 40% lower than previously claimed.

Saudi Arabia's major field is the enormous Ghawar discovery. It was found in 1948 and came on stream in 1951. The accepted 50-year rule suggests that it would have fallen into decline in 2001. Some sources claim that Ghawar peaked in 2005 and it had been responsible for 60-65% of Saudi's output.

But the new seven sisters, despite declining production, are extremely powerful. The reason that the original seven sisters were so important was that they were the oil industry's lawmakers; they controlled both the industry and the market. Now, these new seven sisters are the lawmakers and the international oil companies have to obey or else; and, as the saying goes, 'every dog has his day'.

**Italian-owned large product carrier *Four Sun*, 115,708-dwt. Built 2010.**

## Conclusion

In this final chapter, we have looked at how Chinese shipbuilding growth had again generated the herd instinct with owners. Container ship capacities rose to more than 20,000 teu and Japanese box ship operators consolidated their position to try and compete. Bulk carrier sizes peaked at 400,000 dwt, but caused much hardship among smaller Capesizes. We looked at lay-up choices as markets declined. We discussed the Costa Concordia disaster and there perhaps being a shortage of highly qualified officers and crews as fleets grow.

And finally, the rise in US oil output is shadowed by a decline in Saudi Arabia as their huge oilfields appeared to be running down.

So what of the future? There can be few opportunities for further developments and evolutions within the shipping industry. Some speak of unmanned ships trading the world. But the thought of ships with no crews aboard weaving their way through a hotspot such as the Singapore Straits or close by the Wandelaar lightship in Europe is enough to scupper these ideas.

‘Flying by Wire’ has some imperfections in aeroplanes, so ‘Sailing by Wire’ in ships will be a long time coming. Some say that they will be selling winter sports holidays in hell before it ever happens.

We will see.

# Glossary

| | |
|---|---|
| Abaft | A nautical term describing a position of one object or area to the rear of another. For example, 'the heavy-lift crane was sited abaft the bridge', meaning behind the bridge. |
| Angle of loll | The stability of a ship is based on the waterplane area; the length of the ship times the width. When a ship is afloat and inclined to one side, the width at the waterline will increase, altering and improving the stability. Thus a ship which has become unstable may come to rest at its angle of loll. Instead of completely rolling over. |
| Beam | The extreme breadth of a ship measured from the outside of the shell-plating. |
| Beam ends | The position a ship adopts which has lost all its stability and is lying at 90° to the vertical. The inevitable result is of the ship sinking. |
| Bow | The front end of a ship. |
| Bridge | The deck and area from which the ship is controlled and operated. |
| Bulker | The common abbreviation for a bulk carrier. |
| Bulk carrier | A ship designed with box-shaped cargo areas capable of loading dry cargo in bulk; commodities such are grains and ores. |
| Bunkers | A word used to describe a ship's fuel. |
| Cargo manifold | The line of pipe endings situated in the middle of a tanker on both sides where flexible pipes from ashore are attached to both load and discharge liquid cargoes. |
| Charter party | A maritime contract negotiated between a merchant and a shipowner for the carriage of goods by sea. |
| Classification society | An organisation which dictates the building and continuing maintenance of a ship's structure to ensure its safe operation. Lloyd's Register is an example. |

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| Containers/TEU | A container is used to ship mainly manufactured goods by both land and sea. Developed in the USA, their measurements are in imperial units. Thus a twenty-foot container is twenty feet long by eight feet wide and eight feet six inches in height. This is said to be a twenty foot equivalent unit or one TEU. Containers double the size or forty foot containers are more often carried by ship. These are described as two TEUs. |
| Deadweight | This is the cargo carrying capacity of a ship in terms of weight. It is the amount of cargo that will submerge the ship to its allowable freeboard; the distance from the uppermost continuous watertight deck to the ship's safe waterline. Included in this figure are bunkers, water and stores. |
| Dry cargo | This term is used to describe a cargo which has little or no water content. It includes manufactured goods, coal, iron ore, scrap metal and other cargoes which are largely liquid-free. |
| Fo'c'sle | Or forecastle; this is the area at the front extremity of a ship which is raised above the main deck or continuous watertight deck of a ship. It is mainly fitted with facilities for anchoring or mooring a ship. |
| Freight | Money earned by a ship for the carriage of cargo. |
| Gross tonnage | A measurement, not of weight, but of interior space, usually of 40 cubic feet per ton. It represents the earning capacity of a ship and is used mainly for calculating berthing or canal dues. |
| Hatchcover | These are nowadays rolling steel plates which cover over a ship's hold to prevent the ingress of water. |
| Hatch | The opening in a ship's upper deck that allows cargo to be loaded. |
| Hold | The box-shaped areas below decks on a ship that are designed for the carriage of cargoes. |
| IMO | The International Maritime Organization, based in London and a part of the United Nations, and probably its most effective arm. |
| Knot | An expression of speed amounting to one nautical mile per hour. |
| List | The angle a ship adopts when it is tilted from its normal upright position. |
| Loadline | The marks cut into ships side which indicate to what extent the ship may be submerged to when fully loaded. |

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| Nautical mile | A nautical mile is a unit of measurement defined as 1,852 meters or 2,025 yards. Historically, it was calculated as one minute of latitude, which is equivalent to one sixtieth of a degree of latitude, measured from the centre of the earth to the earth's surface. |
| Poop | The raised portion of a ship's accommodation situated at the rearmost end of a ship. |
| Self-trimming | The interior design of a ship's hold which forces bulk cargoes into an almost level surface instead of an angle of repose. |
| Shipbroker | A trained professional who negotiates shipping contracts between merchants and shipowners, or acts as an intermediary in most forms in the maritime world. |
| Steam turbine | A form of marine propulsion where high pressure steam is forced across angled blades to produce a rotating motion. |
| Stern | The rearmost part of a ship. |
| Thrusters | Propellers, usually in tunnels across the vessel that give sideways thrust to provide a ship with movements at right-angles to her normal direction of travel. |
| Tonne-mile | A term which describes the amount of cargo involved in a certain trade. It is tonnes of cargo in relation to the distance travelled. |
| Tonnes or tons | An expression of weight. A tonne is a metric ton or 1,000 kilograms. A ton is an imperial long ton of 20 hundredweight, each of 112 pounds, amounting to 2,240 pounds. |
| Triple-expansion engine | An engine comprising of three cylinders of different sizes. High pressure steam is forced into the smallest cylinder whose piston is driven down. The steam having expanded, is forced into the middle-sized cylinder, driving its piston down. The steam having expanded even more is pushed into the largest cylinder driving its piston down; all three actions contributing to one complete rotation when the progression starts again. |
| Turbo-electric | A propulsion system where high pressure steam from a boiler drives turbine blades and create a high speed rotation of a shaft. At the end of a shaft is an electrical generator which produces electricity. Such electricity drives an electric motor which is coupled to the ship's propeller. |
| Tweendeck | A derivation of the term 'between decks'. These are decks in the cargo holds which divide the hold horizontally into different cargo spaces. A ship may have a single tweendeck which divides the |

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|---|---|
| | hold into two. Or an upper and lower tweendeck, which divides the hold into three. |
| Tweendeckers | Ships that are fitted with tweendecks. |
| Weather deck | The uppermost continuous watertight deck of a ship, one which is usually exposed to the elements. |
| Worldscale | A book which tabulates freight rates between thousands of given ports. They are calculated using port to port distances, port costs and bunker prices on a round voyage basis. They are designed so that the end result is that ships of a similar description will attract the same earnings whatever voyage they perform. Market forces dictate what percentage of the scale rate the ship is contracted at. |

# Appendices

The following appendices are largely personal accounts from seafarers who have experienced the trials and tribulations of serving aboard war-built ships.

## Appendix 1

### Health and safety, fifties-style.

Probably in common with many war-built general cargo ships of that era there were many instances of cargo shifting. In September 1957, while on passage from Aden to Karachi, our cargo of railway wagon wheels in No 3 hold started to break loose and were threatening to pierce the ship's hull. The stow consisted of two railway wagon wheels joined by an axle, all stowed in a nest several layers high and lying fore and aft. Each wheel and axle rested on the one below cushioned by timber dunnage and lashed to the next with wire lashings. It certainly looked safe when we left Glasgow but we'd been rolling heavily for some days and several lashings had parted. As a result, the stow was rolling side to side in the hold and had broken the ship's permanent dunnage; the side battens along the sides of the ship's hold. The ship's side was in danger of being impacted and holed below the waterline.

We were sent below with ropes, wires and clamps and by standing in front of the axles as they came towards us we were able to temporarily lash them to the ship's side with rope before securing each with wire. Once we'd secured one we could duck under it and move to the next and repeat the procedure. As the movement of the stow decreased, we were able to move up the stow, standing on the axles, to repeat the process. The first few were quite frightening as we watched the wheels coming towards us, hoping that they didn't crush us, penetrate the ship's side or both. But our confidence increased as the movement of the stow was reduced and finally, after many hours, the danger was eliminated.

# Appendix 2

## Failed welds.

My first ship was the *Clan Macfadyen*, ex *Samderwent*, and built in the USA in March 1944. It was on voyage No 44 to India. It was its last voyage as a Clan Boat and when we drydocked her in Glasgow at the end of the voyage it was sold off to Greek interests to become the *SS Betavista*.

We spent a lot of time in Colombo on that voyage. The cadet's cabin was minute, just room for two bunk beds and a small couch. They had added a bridge and wheelhouse above the original. The old wheelhouse was just an empty room and was part of the Captain's quarters.

There was a weld up on the foredeck that had failed. It was re-welded in just about every port, but as soon as we hit any swell it broke open again. We used to put a 2lb ballpeen hammer into the open weld to watch it get crushed as the ship flexed.

A few years ago I was watching a programme on *Liberty* ships on the History Channel and they showed one being launched. I somehow got a screen grab of it and cleaned it up and I think it is actually the *Samderwent* being launched!

The *American Victory* is a museum ship in Tampa, Florida. Unfortunately it was closed when I was there, but will certainly visit it next time I'm in Florida. It will bring back memories from my teenage years.

# Appendix 3

## Fire in the hold!

At one time or another, most of Ellerman's *Liberty* ships were engaged in the carriage of jute from India and East Pakistan, now Bangladesh, to mills in Europe, Ireland and in particular, Dundee in Scotland. These cargoes were prone to spontaneous combustion, often with fire breaking out as the ship neared the discharge port some 40-50 days after sailing. Loading would have taken around a month in anchorages such as Chalna. Thus some of the jute bales had been in the holds for up to 80 days. Although hold temperatures were monitored religiously several times a day, if fire broke out there was little that could be done to extinguish it. For instance, in August 1958, a barge laden with jute had caught fire and sunk in the river at Chalna five weeks before our arrival. Then when we sailed downriver over four weeks later, smoke was still billowing to the surface of the river as the jute fire was still burning underwater.

Three of the ships I served on had fires, fortunately not while I was aboard, but on 7 October 1957 while sitting on the bore moorings in the Hooghly River at Calcutta, we four apprentices were clearing out the fo'c'sle store below the main deck. A recent jute fire in No 1 hold had burned the paint off both sides of the collision bulkhead and everything in the fo'c'stle store was scorched including all the drums of paint and chemicals.

Some drums had buckled with the heat and so, with labels burnt away, we had no idea what was stored there so, drum by drum, we were removing the lids to determine the contents, then labelling and stocktaking them. Unfortunately, when the senior apprentice was opening a drum the contents erupted all over his head and face. He was in agony as we got him up the ladder and through the hatch onto the foredeck where fortunately we had 'water on deck' and we quickly hosed him off. It was highly-polluted River Hooghly water, but it was the only water we had readily available. The drum had contained carbolic acid.

He was rushed to hospital ashore and after four days, the doctors assured him he would regain his eyesight in due time, but was to stay bandaged.

# Appendix 4

## Lifesaving equipment

Experience of a deck cadet who joined the *SS City of Colchester*, built in March 1944 as the *SS Samlea*.

A few minutes after joining the *City of Colchester* in Glasgow, the first mate told me to change into working gear and do whatever the Lloyd's surveyor instructed me to do. When I reported to him he was tapping the hulls of the steel lifeboats with his surveyor's hammer. On one boat he penetrated the hull and subsequently condemned all four. They were offloaded and subsequently a couple of days later a steam tug came alongside with four timber lifeboats in tow. These were from the Brocklebank ship *Mahout* and had the name and the date 1919 cut into their timbers. Another task was to stencil our ship's name onto each.

Later in that first day, the surveyor told me to get some red paint and paint red lines around the davits. Being naturally inquisitive, I asked why and he told me they were condemned. I asked what would happen next as we were starting a voyage to India the next week. He said they were OK for this voyage but would have to be replaced within a year, a very comforting statement. Perhaps this contributed to the decision by Ellerman Line to sell the ship the following year when it became the Liberian flag *SS Sunset*.

# Appendix 5

## Cargo work

A *Liberty* ship's apprentice describes cargo work on these ships.

Like many ships of that era, the hatch covers comprised lateral portable hatchway beams into which timber hatchboards were fitted by hand, a somewhat challenging task at times as two teenaged apprentices found; they were heavy and also often only fitted in a specific sequence. These hatchboards were then covered by several layers of canvas tarpaulins which were secured around the edge by wooden wedges driven into cleats and then, for longer passages, steel securing bars were fitted over the canvas laterally.

To work cargo, the hatches had to be uncovered and the bars, tarpaulins and hatchboards stowed on the adjoining deck and the wedges collected into sacks. The deck space wasn't adequate given the competing need for space by wire runners and preventers from the derricks, ring bolts, cargo clusters for night work, access to the steam winches and sometimes over-stowed cargo requiring temporary deck storage. So access to the hatchcoaming could be somewhat difficult or hazardous at times as we apprentices were responsible for keeping a tally; that is recording identification marks as well as indirect supervision of the cargo work on behalf of the first mate, hence we always had a much used notebook in our top pockets.

When rain threatened, or at the end of a shift, all the hatch gear stowed on the deck then had to be replaced, sometimes very rapidly, to protect the cargo beneath. Certainly on these ships we apprentices learned a lot and became extremely adept at cargo work.

For night working, cargo clusters which were portable lamps hung on lanyards, were used as illumination in the holds and often suffered damage, particularly those at the corners of the hatch. Thus we were forever replacing light bulbs and blown fuses. The latter were copper strips within a small brass cylinder located in an unlit deckhouse, generally behind a working cargo winch. The operation was fiddly and on occasions, we were known to substitute suitable-sized nails as a replacement for the fuse, strictly in the interest of keeping the stevedores working.

# Appendix 6

## Speed

Nominally Liberty ships were supposed to have a design speed of 11 knots but I never experienced travelling at such a giddy pace. On my first ship the Master used to reward us all with fruit cake if the day's run achieved 240 nautical miles or an average of 10 knots. There was seldom any supply of fruit cake on offer.

In heavy weather 3-4 knots wasn't unusual and I recall on 3 October 1958 in the Atlantic the Dutch tug *Noordsee* radioed for assistance as it was towing two barges, with crew on each, the second of which was sinking. We were the nearest ship and naturally went to assist. Volunteers, all single men except the engineers as they were all married, stood by our only motor lifeboat. It was swung out and held in the gripes ready for lowering if we got close enough. We volunteers were convinced in the prevailing seas that if we were to launch we'd never get back to our ship. Looking death in the face was unsettling for teenagers.

Our speed was such, at a full 75 rpm plus some reserve, that we were quickly within sight of the tug and barges. Almost as soon as we arrived, the second barge in the string sank just after the crew had managed to get hand-over-hand along the towline to the first barge. Subsequently the two crews went hand-over-hand to the tug and the first barge sank as we watched helplessly, still not close enough to render any assistance. But at least the crews were safe and our families never received condolence letters from the company.

On another voyage, a passage from Belfast to Dundee around the top of Scotland, the ship had to anchor until the tide changed as it was too slow to stem the tide without going backwards.

On the 20 August 1957, as we steamed sedately in the Mediterranean, the then largest tanker afloat, the Greek *World Splendour*, of 40,530-dwt and owned by Stavros Niarchos, approached from astern and passed us at speed, leaving us in its wake. But the next day the ship had two internal explosions and caught fire. It was taken in tow by two tugs but sank. There were several fatalities.

# Appendix 7

## Speed again

In the engine room, the 1950-built cargo ship *SS Olinda* had three Scotch boilers and a three-cylinder steam reciprocating engine and the ship was anchored off Port Said.

The Suez Canal pilot boarded, an American in civilian clothes. He asked the Master what sort of speed we could make. Captain Elsam was dressed in fully starched white uniform, with white buckskin shoes and long white socks. He wore his white peaked cap with 'scrambled eggs' on the peak and bright gold epaulettes on his shoulders.

He drew himself up to his full height. "We can make about 9½ knots," he said.

The pilot looked startled and gave a low whistle. He turned his baseball cap back to front, grasped the bridge-front rail tightly with white knuckles showing and looked at the captain. "Let her go, Skip," he said, "Full speed."

The third officer rang the engine room telegraph for full ahead and the captain gave the pilot such a withering and chilling glance, it would have frozen over Dante's inferno itself. "I'll be in my cabin," he said stiffly and left the bridge.

# Appendix 8

## Thirsty ships

Liberty ships were originally designed for relatively short transatlantic voyages and carrying a complement of around 40 people and so the water supply was relatively small. We carried a complement of 15 Europeans plus 50-60 Indian crew. Voyages were of a much longer duration and with no water-making facilities onboard, we were generally on almost constant water rationing.

For us apprentices it was generally one galvanised bucket of water per day, taken from a pump near the poop. But when water was in short supply this was reduced to one bucket between two, for drinking, washing ourselves and our clothes. Our laundry was often towed astern for a few minutes to get the worst of the grime off. Our white uniforms worn in the saloon had to have more gentle treatment.

Consequently, as we apprentices were mainly employed in chipping, scraping, boxing up and painting, and often used our hands and cotton waste instead of paint brushes, we tended to get very dirty. But we were also required to front up for meals in our white uniforms. So three times a day we stood in a basin of shallow water for a sponge bath, often administered by our cabin mates so as to conserve water. We had a very rigid and fair order of the wash so each at some stage got first use of the clean water. But, as you can imagine, the colour and consistency of the washing water at the end of the day was rather soup-like.

At least during the monsoon season we could rig up a canvas awning over the poop and collect rainwater, funnelling it into the tanks and giving us a better supply.

However, our water-collecting method backfired on us a little when in Chalna. We were at anchor there for over a month in 1958 when we loaded 69,000 bales of jute. This coincided with a cholera epidemic ashore. Funeral pyres burned 24 hours a day on the riverbank all the time we were there and in close proximity. The water we collected in our canvas awning tasted of ash and goodness knows what else besides.

Other ships' crews were treated differently; the female crew on a Hansa line ship anchored nearby were repatriated as they complained about being sickened by the constant smell of burning bodies.

# Appendix 9

## Hull cracks

*As described in the first chapter, the high sulphur content of the steel in Liberty ships affected their lifespan.*

On my final voyage in a Liberty ship we sailed from Chalna to Belfast with a full cargo of jute loaded in only 31 days. When we were somewhere near Trincomalee in what is now Sri Lanka and when checking the steering gear, I noticed a narrow shaft of light coming from the starboard side. On checking I found a minute crack in the hull. On reporting it to the first mate, I was asked “Did you ‘mike’ it?”

He explained it needed to be measured every watch using a micrometer and the gain in length, if any, being recorded in chalk on the hull. This we did on every watch and it slowly lengthened which imbued us with confidence as the popular story at that time was of Liberty ships shedding their bows or sterns.

Many days later when leaving the Mediterranean we received the order to ‘paint ship for new owners’. This proved a difficult task given the weather, particularly the rain, and besides we’d called at both Aden and Suez where, not surprisingly, a great quantity of paint had gone astray. The other cadet, Simon Holdsworth, and I painted all the green winches with a small amount of paint mixed with copious quantities of linseed oil which resulted in a very shiny finish. We crossed our fingers it wouldn’t rain until after the new Lebanese owner’s representatives had inspected the ship on arrival in Belfast.

Fortunately our luck held out, the stern remained firmly fixed to the rest of the ship, the paint passed muster and the ship went on to carve its name on the plaque that is called history. It was renamed *Marucla* and was involved in the carriage of Russian missiles to Cuba in 1962.

# Appendix 10

We sailed from Aden in the last week of October 1962. At that time we listened to Aden Radio which reported that things were boiling up between the USA and the USSR over missiles in Cuba. These were long-range weapons which threatened much of continental USA.

When we were getting out of wireless range of Aden Radio, the two leaders, Kennedy and Khrushchev, were standing toe to toe trying to stare each other down, seeing who would blink first.

When we reached Mombasa, it was all over and global nuclear war had been averted.

During the passage from Aden to Mombasa, there was much discussion among the ship's officers as to what we would do in the event of a nuclear conflagration. After all, we were nowhere near where any nuclear blasts would be experienced.

Fortunately, no decisions had to be made.

# Appendix 11

I joined my first ship in December 1951 in West Float, Birkenhead. We two cadets were both first trippers. Our ship was the *SS City of Portsmouth*, formerly the 1944-built Liberty ship, *SS Samsoaring*. We sailed in deteriorating weather and were racing down the Irish Sea at about 10 knots, when we were put on alert to try and find the American ship *Flying Enterprise*, which we described in the *Chapter one*. I was stationed on the monkey island all day, trying to keep a lookout despite being by now soaked to the skin. We never did see the *Flying Enterprise*, nor the tug *Turmoil*, and so we carried on bound for Port Said. When we arrived there, the Egyptians had started to play up and we had to use our ship's lifeboats and crew to moor up to the buoys; an experience in itself.

Then on to Mombasa, where we finished up being moored in Port Reitz, seemingly forever. The port was severely congested with imported cargo. The only means of clearing it was transportation by rail up-country. There was only a single-line railway track to Nairobi, so everything moved at a snail's pace.

Liberty ships were built for the North Atlantic, not for hot weather, so life was most uncomfortable for us all, and particularly for cadets as we were berthed in the cabin aft of the bathrooms and over the galley and engine room skylight. In the end, the first mate felt sorry for us, and moved us to the pilot cabin on the main deck starboard side, which was larger and airier. The snag was that there was a steam winch right outside. Not only did we have that, but the steam pipe serving the winch ran through our cabin. This steam pipe made a very cosy home for the multitude of cockroaches who lived aboard.

While we were anchored, the cadets had spent the day sewing on flags to dress the ship overall to celebrate Princess Elizabeth and Prince Phillip joining the *Gothic* the following day. At about 1630, we were approached by one of the large tugs, skippered by an Indian. He called out to say that King George V1 had died, and that we were to put the ensign at half-mast. This we duly did.

Eventually we did get alongside and work cargo, before working our way down the coast, and eventually arriving at Mtwara. We had a cargo of cement for the ill-fated port that was to be the outlet for the equally ill-fated 'Ground Nut Scheme'. By that stage, all the bags of cement, stowed at the bottom of No 2 hold, had burst, and so the cargo was in bulk. The cadets had to clean it all up. By the time we came up for air, we closely resembled the 'mud men' of New Guinea.

# Appendix 12

## The Greeks

**By Spyros M Polemis**

After the Second World War, the Greek government gave certain guarantees, so that 100 Liberty ships and seven T2 tankers could be made available by the American government for Greek owners to purchase. This was the beginning of the post-war re-vitalisation of the Greek merchant marine.

In the 30 or so years that followed, they reached the highest peak yet in their very long maritime history. The fleet comprised almost 5,000 ships of 52,000,000 gross in 1977 or 4,750 ships of over 54,000,000 gross tons in 1981, the largest fleet in the world: A magnificent achievement indeed.

Thus, we Greeks have gone through history. We have seen the struggles, we have listened to facts, but only one aspect of their character really stands out. The Greeks, more than any other people in the world, have remained mariners without interruption throughout their history.

They have loved the sea, they have thought of it as a beautiful element, they have been happy at sea; a friendly environment for them and an extension of themselves. They have enjoyed the feeling of independence, and the optimistic outlook it gave them. They have enjoyed its freedom and the freedom of spirit. So, we have not in fact been talking about history at all, but about a love affair between the Greeks and the sea, an inseparable couple, two inseparable elements of life.

# Appendix 13

Different variants of the T2 were brought into service. Many were specifically designed for different or specialist tasks.

A) The tankers built in accordance with the 'emergency programme' and launched by F.D. Roseveldt were 684 ships split into various series but with notable differences

1) T2-A with 16,300-dwt with a top speed approaching 16.5 knots (only 5 were built)

2) T2-SE-A1, the most common variety: 16,613-dwt on 30'1 ¼"draft and a 7,240 bhp turbo electric engine giving 14/15 knots (70% of the T2 fleet)

3) T2-SE-A2 variation, nearly identical to the T2-SE-A1 version, only with maximum power of 10,000 bhp rather than the former's 7,240.

4) T2-SE-A3 an A2 variation essentially built as a Navy oiler from the start, rather than converted later as many A2s were

5) T3-S-A1 identical to the original T2s except for having less powerful engines: 7700 bhp. Twenty-five of this design were ordered.

B) When the war was over, 447 tankers were sold off by the US Maritime Commission. About 244 went to US owners, nearly 70 went to companies under US control via the Panama flag and 130 or so to European subsidiaries of oil majors.

# Appendix 14

Following the Six-Day War, the Suez Canal was closed to shipping. At that time 15 merchant ships were anchored at the halfway point in the canal at the Great Bitter Lake. They remained there for more than eight years. The area is subject to sand storms. Sand settled on the ships in great quantities gradually turning all the ships yellow. It gained the nickname the 'Yellow Fleet'.

The owners negotiated with the Egyptians and were able to arrange for crew members to be relieved at set intervals, but the ships stayed put. The crews formed what was known as the Great Bitter Lake Association. They traded goods with each other and held sporting and social events.

There were four ships from the United Kingdom, two each from the United States of America, Sweden, Poland and West Germany. The French, Bulgarians and Czechs had one each. Films were shown on the Bulgarian ship, the *Vasil Levsky*. Football matches were played on the British vessels, the Blue Funnel Line's *Melampus* and *Agapenor*, Port Line's *Port Invercargill* and Blue Star Line's *Scottish Star*. The German ships, the *Nordwind* and *Munsterland* hosted church services, while the Swedish ships, the *Killara* and *Nippon*, offered their swimming pools.

During the summer Olympic Games of 1968 in Mexico City, the crews celebrated the occasion with rowing races using the ships' lifeboats. Sailing regattas were also held and swimming races between ships. No record of medal-winners has been kept.

To enable the crews to keep in contact with their folks back home, the ships printed their own postage stamps. These were finely crafted as every merchant ship carried fine-nibbed pens and coloured waterproof inks for making chart corrections. These stamps were accepted as legally-binding by the Egyptian Post Office and used around the world. They are much sought-after everywhere by stamp collectors, or philatelists as they are known.

The Shah of Iran said in an Oriana Fallaci interview after the Yom Kippur war and published in the *New Republic Magazine* in December 1973:

*Q: And the price of oil will rise?*

A: Of course it's going to rise. Certainly! And how! You can spread the bad news and add that it comes from someone who knows what he's talking about. I know everything there is to know about oil, everything. I'm a real specialist and it's as a specialist that I tell you: the price of oil must rise. There's no other solution. However, it's a solution you of the West have wished on yourselves. Or, if you prefer, a solution wished on you by your ultra-civilized industrial society. You've increased the price of the wheat you sell us by 300 percent, and the same for sugar and cement. You've sent petrochemical prices rocketing. You buy our crude oil and sell it back to us, refined as petrochemicals, at a hundred times the price you've paid us. You make us pay more, scandalously more, for everything, and it's only fair that, from now on, you should pay more for oil. Let's say… 10 times more.

*Q: Ten times more?*

A: But it's you, I repeat, who force me to raise prices! You'll have your reasons, certainly. But I too, begging your pardon, have mine. Besides, we won't go on squabbling forever. In less than 100 years, this oil business will be finished. The need for oil increases daily, existing fields are becoming exhausted and you'll soon have to seek some other source of energy: Atomic, solar or what not. You'll have to resort to several solutions, one won't be enough. For instance, you'll have to exploit the power of the ocean tides with turbines. Or else you'll have to dig deeper, seek oil 10,000 meters below the seabed or at the North Pole… I don't know. All I know is that the time has already arrived to take measures, not to waste oil as we always have. It's a crime to use it as we do nowadays.

*Q: This curse we call oil.*

A: I sometimes wonder whether that isn't indeed the case. So much has been written on the curse called oil and believe me: when one has it, on one hand it's an advantage but on the other it's a great inconvenience. Because it represents such a danger. The world could blow up on account of that cursed oil.

# Appendix 15

## Atlantic Container Lines (ACL) development

**1975-78**
ACL pioneers SPEED (Europe) and COMPASS (North America), the first 'real time' computer system in the transportation industry. Its G-1 (First Generation) vessels had a capacity of 700 teu. The G-1 vessels were then lengthened, increasing their capacity to 1,100 teu, joining its six 900-teu G-2 class. ACL introduced direct services to the Canadian ports of Montreal and Halifax.

**1980-82**
To better service its customers through enhanced job performance, a record number of ACL staff attended further education studies and management courses. Intense project studies on the future G-3 vessel fleet are completed and newbuilding orders are placed.

**1984-85**
Five newly constructed ACL G-3 (third generation) ro-ro/container ships, the largest of their kind in the world at 2,160 teu, enter the North Atlantic service. The G-3s are fuel efficient and highly flexible for a wide mix of cargoes. The G-1 and G-2 vessels are phased out and scrapped.

**1986-87**
ACL receives the President's 'E' Award for Export Service for its outstanding contribution to the Export Expansion programme of the United States of America. As part of an overall rationalisation programme on the North Atlantic, ACL enters a space-sharing and charter agreement with Hapag-Lloyd. Focusing on long-term corporate strategies and successful growth, ACL restructures its US operations. A subsidiary is formed to operate ACL's non-shipping sector in trucking, maintenance and repair, container storage, liner agency and stevedoring services. The G-3 vessels are lengthened (G-3L) to 292m increasing capacity to 3,100 teu. The G-1 vessels are phased out and scrapped.

**1989-90**
Corporate headquarters are relocated from Southampton, England to South Plainfield, New Jersey. ACL's original consortium ownership is dissolved. Transatlantic, a member of the Bilspedition Group, acquires 100% of Atlantic Container Line. Formal quality programmes are set in place.

# Appendix 16

The Iranian Navy established a naval blockade of Iraq. They used Vosper-Thorneycroft-built *Alvand*-class frigates to stop and inspect any ships thought to be trading with Iraq. They operated without hindrance; Iraqi pilots had no specific anti-ship training. Some Iranian warships attacked tankers with ship-to-ship missiles. Others used their radars to guide land-based anti-ship missiles to their targets. It started to rely on its new Revolutionary Guard's navy, which used Swedish-built 13m attack craft fitted with rockets and heavy machine guns. These would launch surprise attacks against tankers and cause considerable damage. The country also used aircraft and helicopters to launch missiles and rockets at tankers.

A US Navy frigate, the *USS Stark*, was hit in May 1987 by two Exocet anti-ship missiles fired from an Iraqi French-built fighter. The missiles had been fired at about the time the plane was given a routine radio warning by *Stark*. The navy ship did not detect the missiles with radar, and warning was only given by the lookouts moments before they hit. Both missiles hit the ship, and one exploded in the crew's quarters, killing 37 sailors and wounding 21.

# AN INDUSTRIAL REVOLUTION:

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**This book *should* be required reading for *all* the office bound personnel in shipping organisations; to give them a perspective of where shipping has come from in the last 7 decades.**

**Captain W.A.Maskell**

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