



CAPTAIN MARLOW'S LOCKER



Wreckage of the s.s. *Iron Crown* found after 77 Years.

On evening TV on 23 April, it was announced that the research vessel *RV Investigator* had located the remains of the s.s. *Iron Crown*, about 100 km off the Victorian coast at 700 metres below the surface of Bass Strait. Sonar equipment was used to find the hulk and a special camera took photographs of it settled in an upright position. It appears to be in very good condition considering the time it has been underwater. The photos shown on TV were only of the bow and forward section and it is believed that the after section which was struck by the torpedoes will show considerable damage.

On 4 June 1942 the ship was torpedoed by the Japanese submarine *I-27* (some sources name *I-24* as the submarine responsible) while on passage from Whyalla, South Australia, to Newcastle, New South Wales, with a cargo of iron ore. She sank within sixty seconds taking the lives of 38 of her crew. There were five survivors who managed to grab lifejackets and jump from the ship to be picked up later by s.s. *Mulbera*.

Wartime censorship of newspapers, and radio, resulted in the Australian public being unaware of the losses of shipping around the coast. During June and July of 1942 sixteen ships were attacked off the east coast with seven of these being sunk. In 1942 twenty ships were attacked, of which eleven sank, while several others which did not sink were seriously damaged. During WWII the Imperial Japanese Navy had some of the largest submarines in the world some of which carried floatplanes in watertight hangars on their foredeck.

Built as s.s. *Euroa*, at Williamstown Dockyard, she was launched on 27 January 1922 for the Australian Commonwealth Shipping Board. With the disposal of most of the ships of the Commonwealth Line over the next three years, *Euroa* was purchased by Interstate Steamships Ltd during 1923, renamed *Iron Crown* and chartered by BHP. Being completed too late, she was never operated by the Commonwealth Line. Registered in Sydney the *Iron Crown* was a steel hulled, single screw ship of 3,353 gross tons, powered by a triple expansion engine of 387 nhp, (built by Thompson & Co. of Castlemaine Vic.). Her service speed was 9 knots and her hull measurements were; length 101m, beam 14.6m and height 8.25m, and loaded draught 7m. She spent most of her working life on the run between Whyalla and Newcastle.

In an article written for *The Dog Watch* No. 62, 2005, Capt. Jim Murdoch gave an eye witness account of the sinking of the *Iron Crown*. At that time he was a young apprentice in another BHP ship, the *Iron King* having begun his time with BHP in July 1941. Jim's article, 'Iron Ships on the Australian Coast 1941—1945', covered his wartime years with BHP. Following is a short extract.

Early in June s.s. *Iron Chieftain* was torpedoed north of Sydney and on 4 June 1942 my ship *Iron King* was bound Newcastle to Melbourne carrying steel products and with the tween decks and decks stowed with 'Toluol', which was highly explosive. We were off Gabo Island and passing *Iron Crown*, at a distance of about eight hundred metres, when she was torpedoed and sank in under one minute. At the time we thought she had sunk with all hands but learned months later that five had been saved by s.s. *Mulberd*, though thirty-eight went down with the ship. The officer of the watch rang 'Action stations' and called the captain who radioed for air cover. *Iron King*, a hand fired, coal burning, quadruple expansion steamer, was at her top speed of ten knots but on this occasion following the captain's 'request' to the chief engineer she attained nearly twelve knots to clear this area. As the underwater speed of the submarine, *I-24* one of the Japanese navy's top units, was probably nearer ten knots, she surfaced to secure us as her next victim.

We opened fire with our four inch and Bofors at about 2,750 metres and when a Hudson bomber with a Dutch pilot arrived a short time later the submarine crash dived and we escaped. The four inch gun was slow to use although we had become fairly competent with much practice. There were eight seamen in the gun crew comprising; the gun layer (DEMS gunner RAN, who fired the gun); the trainer; the breech operator and cocker; the breech swabber; two ammunition suppliers; the sight setter and the gunnery officer. The two ammunition suppliers rammed a shell up the barrel and loaded a silk bag of cordite behind it, the breech was closed and a firing cartridge similar to a shot gun shell was placed in the breech and cocked by the breech operator. When this was done the breech operator yelled, "Breech ready," and the trainer when on target yelled, "Trainer on." The gunnery officer normally said "Fire when ready," and the layer pulled the trigger (something like the chrome brake handles on old trucks) and the gun fired. As soon as the gun fired the breech operator opened the breech; the swabber with mop and bucket of water swabbed the breech and barrel to get rid of any sparks. The gunnery officer instructed the sight setter (e.g. "Up 300") to adjust the fall of shot and the process was repeated.

Our main worry was that we would have an accident while in action. The four inch action shell had a firing pin in the nose to explode it. This pin was protected by a screw-on cap which had to be removed before loading the shell and ramming it up the barrel. An accidental touch on the breech or barrel would have caused a disaster. During the above action the gunnery officer decided to leave the cap on the shell and expected the shell to still explode on the hull of the sub. I can't remember how many shots we fired at *I-24* but we were all nervous because of our cargo and the loss of the *Iron Crown* weighed heavily. In the weeks that followed our ships were all painted grey and the convoy system was introduced.



Cruising is Popular with Australians.

During 2018 1.35 million Australians (5.8% of the population) took a cruise. This is a larger proportion than that of the United States (4%) and the United Kingdom (3%). Most of those Australians who took a cruise chose one in Australia New Zealand or nearer Pacific waters (76.6%) but the number taking a fly-cruise holiday grew more rapidly last year. Most popular overseas cruises were to Europe/Mediterranean, followed by those to US waters (Caribbean/Alaska/Hawaii) and to Asian countries. A little more than a half of those taking a cruise last year (53%) were from NSW, with Queenslanders next at 22% and Victorians 13%. Their average age was 49 years and the average length of cruises was 8.8 days. About 200,000 people from overseas countries also came to cruise in Australasian waters in 2018. The construction of new Cruise Terminals in Brisbane, Cairns, Eden, and Broome is expected to increase the enthusiasm for cruising. There is no indication that the Victorian Government has plans to improve the very poor facilities at Station Pier.

New P&O ship to be named *Iona*.

A steel cutting ceremony was held at the Meyer Werft shipyard in Germany at the end of April to mark the start of the building of the latest P&O cruise ship. The 180,000 ton *Iona* which will have a passenger capacity of 5,200 will be the largest ship ever operated by P&O and will operate exclusively in the UK cruise industry. She will be the first P&O cruise ship to be powered by LNG which is regarded as the most environmentally friendly power sources currently available for large-scale cruise ships.

Unmanned Mine Hunting vessel for RN.

In the Dartmouth area of the UK, Thales has been testing an unmanned Mine Countermeasures vessel, named *Apollo*, for the Royal Navy. It is claimed to be the first system capable of detecting, classifying and disposing of mines and bombs at sea, without requiring a human operator in the danger area. Mines are detected using a towed mine-hunting sonar unit. The vessel can be programmed to autonomously avoid any maritime obstacles while carrying out a search and dispose mission at sea. During 2018 Thales opened a new UK Maritime Autonomy Centre at Turnchapel to develop unmanned systems.

IMO Sulphur Cap to be 0.50% from 2020.

The requirement to limit the sulphur emissions of ships to 0.50% is causing serious concerns for shipowners. The new limit is a significant change from the current sulphur cap of 3.5%. With the sulphur content of heavy fuel oil, (HFO) used by most ships, at 2.70% the solutions to the problem are limited. Either alternative fuels must be used or a system of exhaust gas cleaning would allow the continued use of the current 2.70% HFO. A recent survey suggests that about one fifth of ship owners will choose the latter with the fitting of 'scrubbers' to the ship's engine exhaust. Low sulphur content fuel oils (below 0.50 %) are being developed but will be much more expensive and likely to be not readily available. A small number of ships will switch to, or be built to, use liquefied natural gas (LNG) but it is anticipated that most vessels will choose marine gasoil (MGO). Many in the industry wonder if sufficient of the compliant fuels will be available and scrubbers, where this is the choice, can be fitted in time. Another problem is the expense and time required to build facilities to produce and to store compliant fuels. These will have to be completed separate from HFO. Changed fuels will also require changed lubricants which will have to be developed and made available to ship operators around the world. Questions are also being asked about the policing of the new regulations. Will they will come into force on 1 January 2020 or will there be a phased introduction?

What is MGO?

Marine gasoil (MGO) which usually consists of a blend of various distillates, is similar to diesel fuel, but has a higher density. Unlike heavy fuel oil, MGO does not have to be heated during storage and as it has a low viscosity it can be pumped freely at temperatures of around 20°C. MGO shares many of the same properties as heating oil but, as it is almost colourless a red dye is added to distinguish it from heating oil, which is coloured with a yellow dye. International regulations require that sulphur content of MGO must be below 1.50%, which would not satisfy the new limit, but low sulphur MGO which usually has a sulphur content of less than 0.10% is well below the new IMO sulphur cap. As well as lower sulphur emissions MGO produces much lower levels of particulate matter and soot in exhaust emissions. The two main problems of using MGO are the necessity to alter engine technology, to suit the low sulphur content, and the purchase price. The current price of MGO is more than double that of HFO which will be a major concern for shipowners.



What is a Scrubber?

A scrubber is a filtering device fitted to the exhaust system of a marine diesel engine which removes the sulphur compounds. These devices allow a ship to use HFO, containing a high sulphur content, without polluting the atmosphere with sulphur oxides. Sulphur dioxide has been linked to premature deaths from lung cancer and heart disease. This same gas in the presence of certain catalysts produces sulphuric acid, which causes acid rain. Acid rain is harmful to crops, soil, waterways, many metals and to buildings. With the shipping industry being the biggest emitter of these pollutants, the IMO has brought in its new limits on the amount of sulphur oxides permitted in the exhaust gasses of ships. One choice available to shipowners to reduce the sulphur content of a ship exhaust gases is to fit a 'scrubber'. The cost of fitting a scrubber will, in time, be covered by the use of cheaper high sulphur content fuel. Scrubbers can use either a 'dry' or 'wet' process. Wet scrubbers are usually preferred because of their increased efficiency over dry scrubbers. Three choices of wet scrubbers are available — open loop, closed loop or hybrid.

In a scrubber the exhaust gases pass through a spray of liquid which neutralizes the sulphur oxides and removes some of the heavy metals and particulate matter. Open loop scrubbers use sea water because of its high alkalinity. The waste water is treated before being returned to the sea.

In a closed loop scrubber the liquid used is fresh water treated with additives which increase the alkaline level. After 'washing' the exhaust gases in the tower the wash water passes into a process tank. This water is constantly reused in the scrubber, with additives and more seawater or freshwater being introduced to maintain the correct chemical composition as required. The fresh water can either be carried in tanks or else produced on board if a fresh water generator is installed on the ship. Only small amounts of water are released into the sea.

Operating costs vary depending on the different resources required — pumps, tanks, power required, etc. A hybrid system provides the opportunity to use either a closed or open loop system depending on the alkaline level of the sea water. Ship owners are being faced with the problem of choosing the most economical system to suit each ship and the areas in which it usually operates.

Several shipping groups have recently announced plans for the fitting of scrubbers to ships in their fleets.

GOGL (Golden Ocean Group Ltd.)

The dry bulk shipping company GOGL has announced that several of its Capesize vessels will be fitted with scrubbers. Higher charter rates are expected when the prices of low sulphur fuel rise as a result of the IMO sulphur cap. The scrubbers will be fitted during routine dry dockings during 2019 and early 2020.

Frontline Limited.

The oil tanker company Frontline Ltd has ordered scrubbers for another twelve of its ships after its earlier order for six in June 2018. At that time it announced that it had ordered scrubbers for fourteen ships with an additional twenty-two to follow.

MPC Container Ships.

The Norwegian ship owner MPC Container Ships has ordered the retrofitting of scrubbers to five of its ships. At the same time plans were made to purchase scrubbers for another fifty ships. MPC will evaluate further scrubber installations on a vessel by vessel basis. It believes that scrubbers will provide the strategic flexibility to adapt to new market environments. The investment program is expected to be financed with cash on hand and available debt capacity on the company's existing fleet.

Hapag-Lloyd

The large container shipping company Hapag-Lloyd is preparing two pilot projects in preparation for the IMO sulphur cap. Scrubbers are to be fitted to two large container ships while the benefits of LNG as a fuel are explored. While these projects are in process the company will not invest heavily in new ship systems.

Hapag-Lloyd believes that the majority of liner companies will have to pick low sulphur fuels as a way of conforming with the sulphur cap because of the limited supply of scrubbers and the capacity to install them.

The likelihood of new regulations banning discharge of washwater from open-loop scrubbers, in certain areas, will make shipowners hesitant to invest in that technology. The preferred option with new-builds for the company is LNG fuel.

TORM

The Danish shipping company TORM has committed to install scrubbers on twenty-one vessels and potentially up to thirty-nine vessels, or roughly half of its fleet. TORM has entered into a new venture (ME Production China), with ME Production and Guangzhou Shipyard to manufacture and fit scrubbers to both new and ships already in service. TORM will hold a 27.5% share in a venture which has the potential to be a large-scale international scrubber manufacturer. With the demand for scrubbers expected to increase significantly with the new sulphur cap, prospects for ME Production China are very promising.