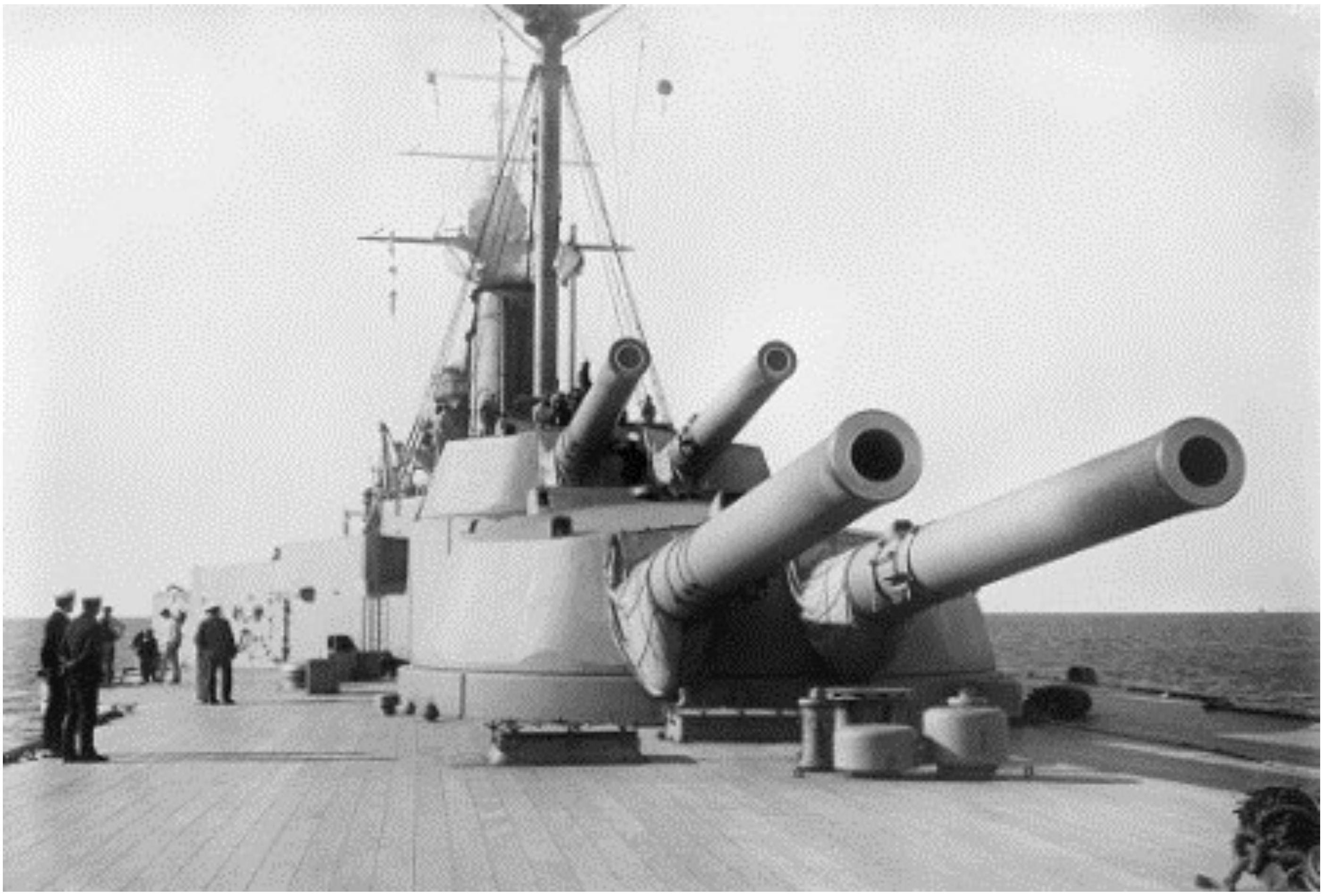
Society Members' Bulletin

1914—2014: 100 year anniversary of the start of the Great War



The super-dreadnought, HMS Queen Elizabeth (1915 to 1945) showing her aft 15 inch guns, some of the largest used during WW1. Weighing in at about 100 tons per barrel and breech mechanism, it hurled a shell of nearly 2 tons a distance of over 19 miles.

October 2014
Issue 10

Royal Naval Engineers Benevolent Society

Founded in 1872

Society Members' Bulletin

October 2014

And so we have reached edition number 10. It seems a long time since the first edition of the Bulletin was sent out to members in 2010, the year when the last class of artificers passed out at HMS Sultan. Now we hear that the RN is to employ American engineers on Royal Navy ships because too many engineers are leaving and not enough are being trained as replacements.

I am staying with the WW1 anniversary theme for this issue and already have a couple of articles lined up for the next issue. It is interesting to delve into the past to see what the RN was doing and how the service seems to have the same problems today as it did one hundred years ago.

I have not produced a 'Special' edition of the Bulletin this year, as I have not found anything substantial to write about or to edit. However if any of you would like something published then please let me know.

Discussions are underway with the owners of 111 North Hill (next door) with a view to a purchase of the property. This would be a medium to long term investment and would utilise some of the money that is stuck in a bank account earning a fairly low rate of interest. The trustees consider this would be a better use of society funds.

Regards

Mark Stevens

Editor, Society Members' Bulletin

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Bring on the big guns–the 15”

The BL 15” Mark 1 was the first British 15” gun design and the most widely used and longest lasting of any British designs. It was the most efficient heavy gun ever developed by the Royal Navy and was deployed on capital ships from 1915 until 1959. 186 guns were manufactured between 1912 and 1918 and installed onto 22 ships. Over their lifetime they were removed from ships, refurbished, and re-installed into other ships.

This gun was an enlarged version of the successful BL 13.5” Mk V naval gun, employing a 76-groove rifling, specifically intended to arm the then new Queen Elizabeth class battleships as part of the British response to the new generation of dreadnought battleships that Germany was building during the naval arms race leading up to the First World War. The normal slow and cautious prototype and testing stages of a new gun's development were bypassed and, due to the urgency of the times, it was ordered straight from the drawing board. In the event it met all expectations and was a competitive battleship main armament throughout both World Wars.

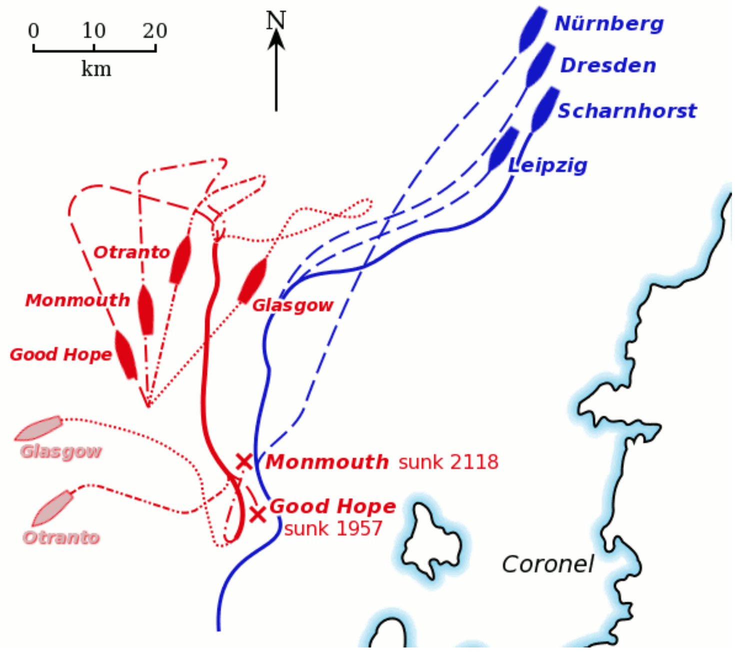
The barrel was 42 calibres long (15” x 42 = 630”). This wire-wound gun fired a 1938 lb. Mk XVIIB shell at a muzzle velocity of 2,458 ft./s. Maximum range in shipboard mountings was 33,550 yards at 30º elevation. During World War II older battleships having gun elevations limited to 20º were supplied with supercharges to increase their maximum range to 29,930 yards at 2638 ft./s using the Mk XVIIB or Mk XXII projectile. HMS Vanguard could range to 37,870 yards while using supercharges at a gun elevation of 30º. Coastal artillery mountings with higher elevations could reach 44,150 yds.

These guns were not made in one piece but built up as a series of tubes, one over the other. Wire-wound guns were constructed using a method introduced for British naval guns in the 1890s, when the strength of the large forgings needed to make an all-steel gun could not be guaranteed. The central A-tube was tightly wound with about 170 miles of steel wire in layers, and then covered by a B-tube and jacket. This provided greater radial strength and withstood the propellant’s gas pressure better than the previous "hoop" construction methods of similar weight.

The introduction of cordite, as a propellant in 1892, generated higher pressures along the length of the barrel than gunpowder. The firing life of a 15 inch gun was approximately 335 full charge firings using standard charges, after which it had to be re-lined.

Two remaining 15” gun barrels can be seen outside the Imperial War museum in London.

The Battle of Coronel—November 1914



For many months the Royal Navy, with Japanese assistance, had been searching for the German East Asiatic commerce-raiding squadron known to be operating under Admiral Spee in the Pacific. In early October 1914 an intercepted radio communication revealed details of a plan devised by Spee to prey upon shipping in the crucial trade routes along the west coast of South America. Patrolling South America at that time was Admiral Cradock's West Indies Squadron. This consisted of two armoured cruisers, Monmouth and Good Hope, the light cruiser Glasgow, and a converted ex-liner, Otranto.

Cradock had been ordered to deal with Spee even though his small fleet was poorly matched against Spee's stronger force of the modern armoured cruisers Scharnhorst and Gneisenau plus three light cruisers. On October 18th Spee set off from Valparaiso with all five warships intending to attack the Glasgow, having heard that it was travelling alone. Cradock, who was aware that his ships were greatly outgunned by Spee's, had been waiting for naval reinforcements. However, neither the Defence, an armoured cruiser, or the Canopus, an elderly battleship, dispatched by the Admiralty, reached Cradock before battle commenced on November 1st.

Deciding that he could wait no longer for the delayed reinforcements, Cradock determined to sail from the Falkland Islands to a predetermined rendezvous point with the Glasgow at Coronel, the latter having been sent there to gather intelligence. However Winston Churchill, in London, issued orders to Cradock, on October 28th, instructing him to halt pending possible reinforcement from the Japanese navy. We are not sure if Cradock actually received Churchill's instructions but shortly afterwards he ordered his squadron to adopt an attacking formation.

Cradock had again received intelligence, via an intercepted radio signal on 31 October, that Leipzig, the slowest light cruiser in Spee's fleet, was in the area. He promptly ordered his squadron north to cut it off and instead found himself confronting Spee's entire force at about 4:30 pm the following day. At this stage it is probable that the British force could have escaped by sailing towards Canopus, then some 300 miles to the south. With the failing light Spee would most likely have lost contact with the British squadron. Instead Cradock chose to stay and fight but ordered Otranto to break formation and flee.

With the seas to the disadvantage of the British, Spee reacted by moving his faster vessels out of Cradock's firing range. At sunset (7pm) and with the moon clearly silhouetting Cradock's fleet, he began to shell the British fleet, with Scharnhorst's third salvo crippling the flagship Good Hope. Both Good Hope and Monmouth were destroyed shortly afterwards. There were no survivors in either, Cradock himself going down with his flagship, the Good Hope. Glasgow and Otranto both escaped (although the former suffered five strikes). Spee's own fleet had suffered little damage and sailed to Valparaiso where he received a rapturous welcome from the local German population.

Once news of the scale of the British defeat, and its consequent humiliation, reached the British Admiralty in London, a decision was quickly taken to assemble a huge naval force under Admiral Sir Frederick Doveton Sturdee. This was promptly dispatched to search out and destroy Spee's force.

The Battle of the Falklands—December 1914

Vice-Admiral Sturdee

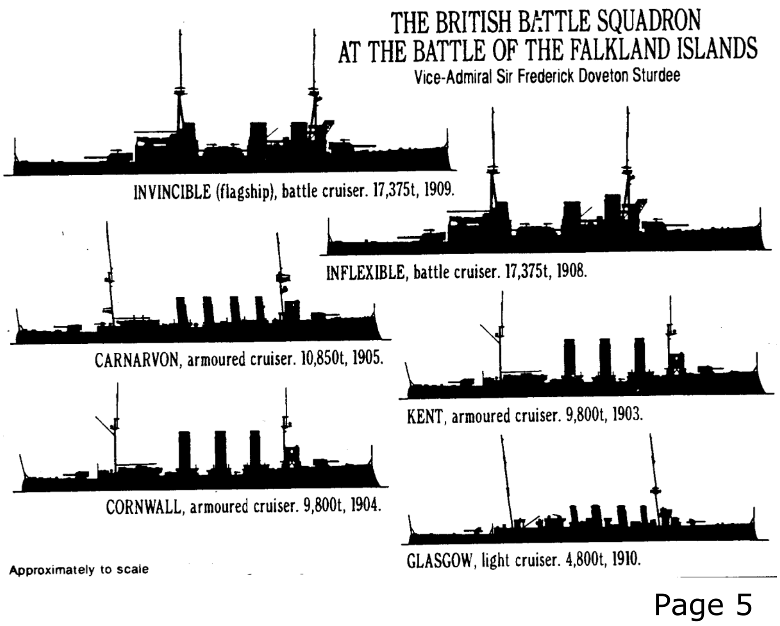
Fresh from his success at the Battle of Coronel, German Admiral Graf Maximilian von Spee's East Asiatic sped towards Port Stanley in the Falkland Islands. His intention was to raid the British radio station and coaling depot there. Spee was not aware however that a British squadron, including two fast, modern battle cruisers, Invincible and Inflexible, were at that same time coaling at Port Stanley, sent by First Sea Lord Admiral Fisher to reverse the British defeat at Coronel.

Each of the British battle cruisers, Invincible and Inflexible, were significantly more powerful than Spee's, being fitted with eight 12-inch guns, whereas Scharnhorst and Gneisenau only had 8.3-inch guns. They were accompanied at Port Stanley by six other ships: The armoured cruisers Canarvon, Cornwall and Kent, two light cruisers, Bristol (Captain Fanshaw)and Glasgow (Captain J.Luce), and the obsolete pre-dreadnought battleship, Canopus.

Spee began his attack on December 8th, intending to subsequently refuel north at the Plate Estuary. Whilst aware of shipping in the area, he mistakenly assumed them to belong to the Japanese navy. With his crew battle-weary and his ships out-gunned, the outcome was seemingly inevitable. Realising his danger too late, and having missed the golden opportunity to shell Sturdee's fleet while in port, Spee and his squadron dashed for the open sea, but at 10am were pursued by the British. Realising that he could not hope to outrun the fast British battle cruisers, Spee decided to bring about an engagement just after 1.20pm.

Despite initial success by Scharnhorst and Geneienau in striking the Invincible (commanded by Edward Bingham), and in then resuming a hasty escape, Sturdee managed to bring his powerful cruisers within extreme firing range some forty minutes later. Invincible and Inflexible engaged Scharnhorst and Gneisenau, while Sturdee detached his cruisers to chase Leipzig and Nürnberg. Four German cruisers were sunk, with Spee's flagship Scharnhorst sinking rapidly first at 3.10 pm followed later by the Gneisenau, Nurnberg and Leipzig.

While none of the British ships were badly damaged, ten British sailors died during the battle. The enemy however suffered huge losses of personnel and ships where 2,200 German sailors were killed or drowned in the encounter. Admiral Spee and his two sons were among the dead and the 215 rescued Germans became prisoners aboard British ships.



The only German ship to escape was the light cruiser Dresden, which roamed at large for a further three months before surrendering off the Juan Fernandez Islands on 14th March 1915. After evacuating his ship the captain then scuttled it by detonating its main ammunition magazine.

Because of the battle, German commerce-raiding on the high seas was brought to an end. Just as significantly, Sturdee's success was taken as a tremendous morale booster by the British, entirely reversing the earlier setback at Coronel.

General Secretary's Report

By Cliff Fiander

The progress of Programme Faraday is reported comprehensively in the regular Faraday column of the "Two Six" section of Navy News and needs little elaboration by me.

The programme has good staff and financial support and is moving towards resolving the difficulties that have arisen from the introduction of the ET. The aim now is for the ET to be better equipped in terms of skills (particularly skill of hand) and knowledge (particularly knowledge of equipment) to meet the challenges of the modern navy whilst there will be the opportunity for the more Artificer-like candidates to take the fast track to senior rate.

A short article from the Daily Telegraph of 12 February 2010, under the heading "Royal Navy consigns 141 year old ranking to history", provides a reminder of where the journey began:

> *A Passing Out Parade will be held at HMS Sultan in Gosport, Hampshire for the final graduates of the Marine Engineering Artificer Qualifying Course.*
>
> *The rank of Artificer, affectionately referred to as "tiffs" or "tiffies", will now fall under the new banner of Engineering Technicians (ET) – ME for Marine Engineers and WE for Weapons Engineers.*
>
> *A Royal Naval Spokeswoman said: "This change of rank better reflects the job of artificers in the 21st Century and recognises the continued evolution of naval engineering.*
>
> *"As an improved method of training, becoming an ET also improves the career training available to sailors, broadens their employability and increases their opportunities in the Navy."*
>
> *Artificers trace their heritage back to Engine Room Artificers, introduced by the Royal Navy in 1868 to take into account the senior service's transition from sail to steam. Endorsed in 1903 by First Sea Lord Sir John "Jacky" Fisher, who was concerned that other navies – in particular the German navy – would surpass the British technologically, training for "boy artificers" was introduced to ensure they would be "second to none".*

Clearly the Society would like to make its contribution and we are in discussion with the programme staff to determine how our support can be used to re-establish the navy's pre-eminence in engineering excellence.

The Society, through its affiliated charities, already provides considerable support to the engineering schools in the form of prizes that are awarded for high achievement on course. This support will be made more flexible in the future as the charities, The Captain Marrack Memorial Fund and the Chatham Memorial Fund relinquish their charitable status and become part of the Society's general funding.

The Society will continue to provide a similar level of funding whilst ensuring that the ethos of the 2 charities is maintained. In maintaining the effective working of the charities for so long and then agreeing to this change the Trustees, in particular Jon Jefferis, deserve great credit and the Society is suitably grateful.

In other areas of activity:

> It has been decided to abandon the initiative to sponsor a "Safety through Engineering Excellence" award. For such an award to be relevant and credible there

would need to be considerable input from already overstretched engineering staffs and this is likely to create the opposite of the positive impression the Society is working towards.

The Society is seeking an involvement with the Reservist initiatives that are being effected to bolster the pool of available engineering expertise.

Marketing of Society Ties and notebooks began with the publication of the autumn 2013 edition of the Bulletin; regrettably uptake has been minimal.

There have been no communications to the Society from the Fleet.

And finally, just for interest:

The Navy List 1870

Introduction of Engine-Room Artificers

Circular No. 23.-N.

Admiralty 23rd April, 1868.

Her Majesty having, by Her Order in Council of the 28th of March, 1868, authorized the employment of Mechanics in the engine-room of Her Majesty's ships, in lieu of junior Engineer officers, and the substitution of such Mechanics, with the rating of "Engine-room artificer," for the present Chief stokers: their Lordships are pleased to issue the following Regulations on the subject.

Qualifications

A candidate for the rating of Engine-room artificer must be an Engine-fitter, a Boiler-maker, a Smith, or a Coppersmith.

His age must not be less than 21, or more than 35 years

He must be able to read and write sufficiently well to be competent to note in the log the particulars of the working of engines and boilers; and he must be generally acquainted with the names and uses of the principal parts of a marine engine.

He must undergo an examination by the Chief Engineer of the Dockyard and the Inspector of Machinery afloat, in the presence of the Captain of the Reserve; and if the candidate appears to be qualified, he is, in the first instance, to he appointed as acting.

He is not to be confirmed until he has served 12 months and has passed an examination: if at home by a Chief Engineer of a Dockyard and an Inspector of Machinery afloat, in the presence of the Captain of the Steam Reserve; or, if abroad, by an Inspector of Machinery afloat, or, if there is no Inspector of Machinery afloat by 2 Chief Engineers in the presence of the Captain of the ship in which the Engine-room artificer may be serving.

He must understand the uses and management of the various gauges - of the feed, injection, and blow-off cocks; he must know how to ascertain the density and height of the water in the boilers, and what should be done in the event of priming.

He must also know how to regulate the water admitted for condensation ; what should be done in the event of water passing into the cylinders; or of a bearing becoming heated; and how to act, on the occurrence of any of the ordinary casualties of an engine-room.

He must also obtain a Certificate from his Captain that be is fit to keep a watch in the engine -room, and is deserving of confirmation.

Pay

The pay of an Engine-room artificer to be:

5s. a-day for the first 3 years

5s. 9d. a-day afterwards.

While acting the pay is to be the same as after confirmation, and if confirmed, acting time to be allowed.

Rank

To be that of a Chief petty officer-in the place of the present Chief stoker, which rating will now be abolished.

Mess

To mess with Masters-at-Arms, and other Chief petty officers.

Pensions

As Chief petty officers.

General

All Engine-room artificers must enter for continuous service.

They will be entered in the Steam Reserve, and kept employed as Mechanics, or on such duties as Assistant-Engineers are now employed on, so as to be always on full-pay; and when on board ships in commission they will be employed in a similar manner.

Entries to be made by the Commanders-in-Chief at the Ports, and confirmations to be made either at home or abroad, by the Commander-in-Chief, or senior officer.

By command of their Lordships

To all Commanders-in-Chief, &c. Henry G.

LennoxSource: Navy List for 1870, Page 472

Merchandising

We have a number of woven silk ties, note books and lapel pinnets available for purchase. Please contact the Gen Sec at the address below.

The General Secretary

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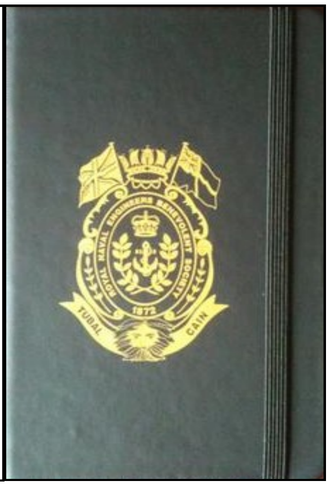
Wiltshire SN12 7FL



The Robbins Memorial Essay Prize

"Have you a story to tell, a simple answer to an engineering problem or an amusing anecdote?" Yes, you have seen these words before in the NER. If the answer is yes and you would like the chance to win a cash prize and have a few thousand well penned words together with a couple of pictures, then send what you have to the Bulletin editor and you may get your name in print. MS-Word and JPG's please. T's & C's apply.

Armour Protection from Nothing?

In his 1969 tongue-in-cheek short story *It was Nothing - Really!*, Theodore Sturgeon wrote about a process by which materials could be made stronger by removing material. He called it “Nothing”.

> *... if, in these special cases, the substance becomes stronger when a small part of it is removed, it would seem logical to assume that if still more were removed, the substance would be stronger still. And carried to its logical conclusion, it would seem reasonable to hypothesize that by removing more and more material, the resulting substance would become stronger and stronger until at last we would produce a substance composed of nothing at all - which would be indestructible!*

Known as Super Bainite, the new armour steel has been developed to have outstanding ballistics properties and, in tests, it has performed better than ‘normal’ steel armour. Super Bainite was invented by Professor Peter Brown, Defence Science and Technology Laboratory (Dstl), Professor Harry Bhadeshia, Tata Steel Professor of Metallurgy at Cambridge University, and Dr Carlos Garcia-Mateo, previously at Cambridge University and currently at the National Centre for Metallurgical Research in Madrid.

Traditionally, steel is covered with water to get it to room temperature quickly before structural weaknesses can form. But, with Super Bainite, a whole variety of cooling methods, involving air or even molten salt, are used throughout production. Combining drilling and hole-punching during the cooling process results in a ultra-high-hardness perforated plate.

The biggest improvement Tata Steel has made since DSEi 2011 is the development of punch perforation plate, again in the half hard condition prior to heat treatment, using standard equipment with low cost customised tooling to maintain a flat plate with customised hole shapes including rounded slots with a width equal to the gauge. The punching process is computer numerical controlled and therefore can be programmed to produce any design, while maintaining a coverage of >80% and an open area typically up to 40%. For example Tata have successfully produced a 4mm by 12mm rounded slot in the 4mm gauge steel with 29% open area.

Recent ballistic tests have indicated that, as part of a spaced armour system design, the 4mm & 5mm perforated strike face provides protection up to NATO STANAG level 3 as a structural system, incorporating a light armour steel hull and spall liner at less than 90kg/m2 and a ballistic barrier at less than 60kg/m2. The heavy gauge steel at 10mm is know to provide good levels of protection, as a strike face for a spaced armour system, against STANAG Level 4 threats with a typical V50 result greater than 1000m/s for 14.5mm BZ32.

Rear Admiral Derek 'Spike' Spickernell CB

One of the last to be formed within Fisgard's divisional system; Spickernell Division, commonly known as 'Spike', was formed in the Spring of 1973 and named after Rear-Admiral Derek Spickernell (1921-2009), a former artificer apprentice who rose to flag rank. First in the Royal Navy, and then at the British Standards Institution, Rear-Admiral Spickernell worked to improve the quality and safety of military and industrial equipment. Later in his career he helped to prepare for the introduction of the IS0 9000 quality assurance regime and became known as the 'father' of today's quality assurance standards.

He trained as an artificer apprentice and was selected for promotion to commissioned rank in 1939. Promoted to Lieutenant in 1942, he joined the Abdeil laying minefields in the Sicilian Narrows. A year later, he transferred to the Wayland then based in North Africa., then volunteered for submarine service. After the completion of training he joined the submarine Tally Ho in Trincomalee (Ceylon) and took part in successful actions against Japanese shipping. In 1944 he transferred to the Statesman as an engineer officer, where the patrols saw many enemy vessels sunk by gunfire and was the last ship to fire a British torpedo in WW2. After the war, he served in submarines Alcide, Tudor and Telemachus. 1951 saw him based in Portsmouth in charge of submarine refits and by 1960 he was Deputy Captain Superintendent of the Underwater Weapons Research Establishment in Portland. He was promoted to Captain in 1962 and became Commanding Officer of HMS Fisgard. He was deputy director of the Naval Ship Production Department in Bath from 1967 to 1970, when he was promoted to Commodore and to Rear Admiral in 1971. He was Director General Quality Assurance at the MoD until his retirement in 1975.

From his illustrious Royal Navy career to his time at the British Standards Institute and beyond, he worked to improve the quality of military and industrial equipment, and later played a pivotal role in the introduction of BS 5750, the basis for the now internationally renowned ISO 9000 quality management system. His achievements have helped to protect people and improve their lives with higher quality goods and services across a broad spectrum of industries, including the building and glass and glazing sectors.

Following his retirement from the BSI in the mid 1980s, Derek Spickernell became a director and then chairman of Ritec, the pioneer of glass surface protection technology. Here he brought outstanding business acumen and enthusiasm to Ritec during the development of the ClearShield System – now the leading, tried and tested technology that converts ordinary glass to Low-M® (Low-Maintenance) Glass. He worked closely with the GGF (Glass and Glazing Federation), spoke at industry seminars and worked on technical committees. From his experience in setting new industrial quality standards at the BSI, Derek Spickernell helped to establish quality control for ClearShield components and quality assurance standards for the whole system.

He was also a council member of the Institute of Mechanical Engineers.

Russian scientists develop submarine stealth technology

Anti sonar coating for the Russian submarine fleet that will allow them to become virtually invisible during combat service is currently being developed by specialists of the St. Petersburg Shipbuilding Research Institute. According to media reports, as a result of the development, the new material will feature embedded active sensors neutralizing sonar search signals of their opponents. This new construction method will reduce their sonar visibility by at least three times. As evidenced by industry-specific publications, the coating will not just absorb the sonar signal (as do the existing passive coating materials of submarine hulls), but neutralize incoming radiation.

Active coating with embedded electronics, together with advanced computer systems, will determine the frequency at which the sonar signals of their opponent operates and launch its own signal of the same frequency but in opposite phase. The technology of anti sonar coating based on a special fabric material using composites should be developed within three years—by 2017. The Russian media has already reported that the first samples will be available by the end of 2016. According to the Russian newspaper, *Izvestia*, government officials are willing to spend 200 million roubles (approx. £37 million) on further developments.

It appears that the new anti sonar coating can be applied not only to fourth generation Russian submarines currently under construction, but also the third-generation boats that are already in service. It will be relatively easy enough to replace the coating on the submarine hulls with a new one and "link" it to the ship's electronic systems. Currently the passive anti sonar coating, a composite material based on rubber, is used to hide submarines from detection.

This new technology has received considerable attention, not only in Russia. The latest submarine designs in the US using an improved hull form, will have an outer coating polished by a special material, which reduces its noise level. However, it would appear that the Russians were the first ones to come up with the new active fabric material.

While this development by Russian scientists is fairly unique, it should be noted that this was originally conceived by German Third Reich designers many years ago. During World War II a leading chemical company, IG Farben, was providing ideas and technologies to the German submarine fleet. They also produced Zyklon B, used in the gas chambers of concentration camps. Under the leadership of Dr Emil Meyer, the underwater sound absorber known as 'Alberich' was invented (named after an old German saint). Although this was the first practical application of the technology that was later called stealth technology, the Germans were not able to produce enough of the expensive 'Alberich' coating for all of their submarines.

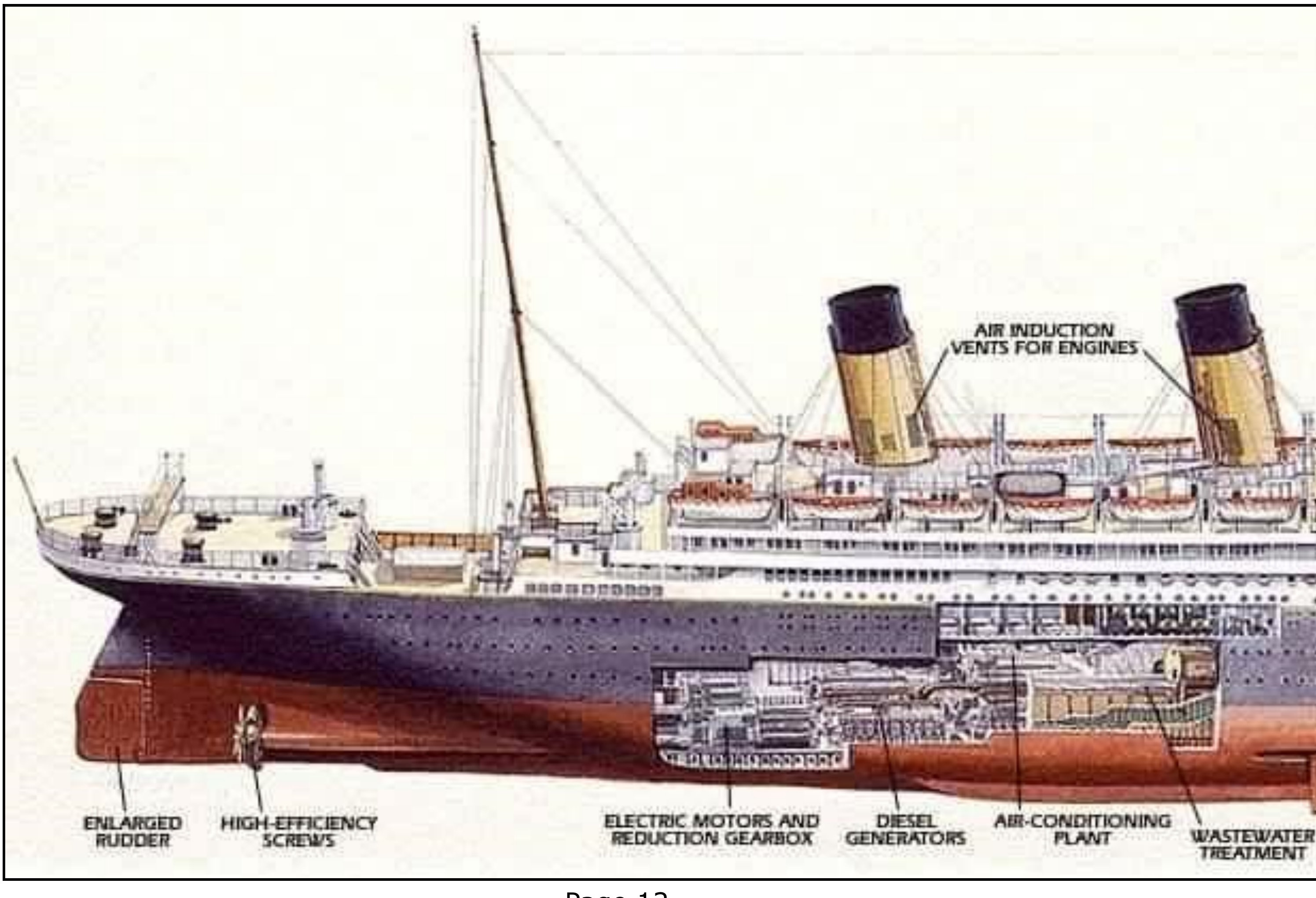
In 1970, the British Acoustic Society established a very high status medal named after physicist Lord Rayleigh. The first recipient of this medal was the German Professor Emil Meyer who had turned seventy that year. This same man who in his youth invented the sonar protective coating for German submariners that destroyed British ships.

Titanic II

58 year old Australian billionaire Clive Palmer has unveiled plans for the construction of Titanic II, a cruise ship designed as a "full-scale re-creation" of the Titanic, which sank in the Atlantic Ocean in April 1912. Displaying a blueprint for the Titanic II at a press conference aboard the Intrepid Sea, Air & Space Museum, Palmer announced that the ship will be built in China and will begin carrying passengers in the third quarter of 2016. Its first voyage is scheduled to be from Shanghai to Southampton, England, and then on to New York.

Palmer, who refused to divulge the cost of building the ship, said "the Titanic was a ship of dreams," and "the Titanic II will be the ship where dreams come true." The businessman, who owns an Australian mining company and several other businesses, said he has received an overwhelming response from prospective passengers who want to travel on Titanic II. He predicted that it "will be a real financial bonanza" so successful that he will "have to build Titanic III." However, some Titanic and cruise-ship experts doubt the Titanic II, which is planned to regularly sail across the North Atlantic, will be able to attract enough passengers after its maiden voyage. Some also question whether the new cruise ship desecrates the memory of those who died on the Titanic.

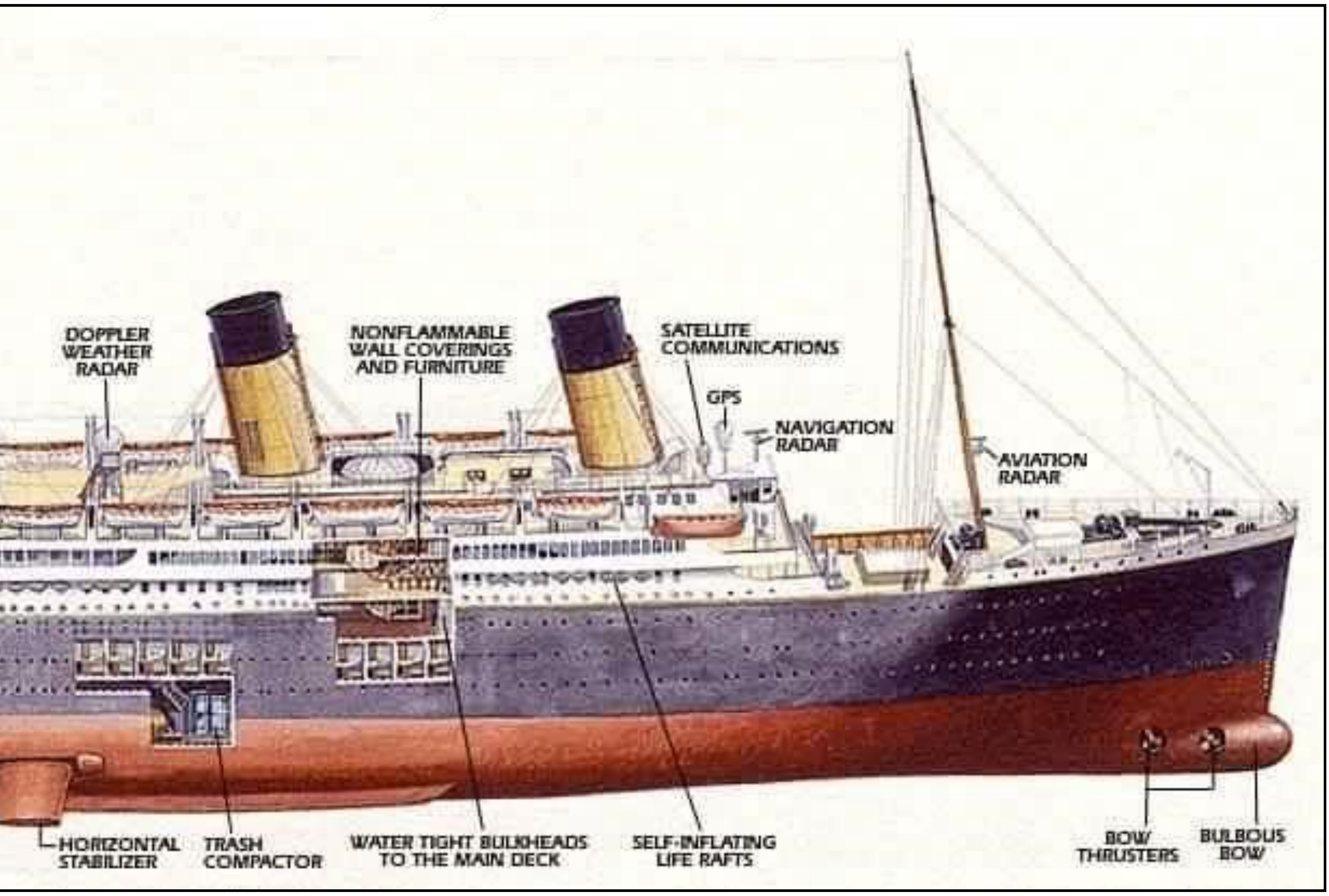
The Titanic — the largest and most luxurious cruise ship of its time — departed from Southampton on its maiden voyage to New York in 1912 and made two stops in Europe before striking an iceberg several hundred miles off the coast of Newfoundland, Canada. More than 1,500 people aboard died after the collision. The Titanic was operated by the White Star Line, and Palmer's cruise company is called Blue Star Line.



The Titanic II will be 883 feet long – 3 inches longer than the original Titanic– and weigh 55,800 gross tonnes, according to Palmer. It will carry a maximum of 2,435 passengers and 900 crew members, and include a gymnasium, Turkish baths, squash court, swimming pool, theatre and casino. In comparison to modern cruise ships, the Titanic 2 will be packing in more people per tonne and will have the lowest passenger-to-space ratio of any current cruise ship in the industry by some 25%. For example most modern ships carrying 2000 passengers are around 80,000 tonnes, so perhaps the Titanic II will not be so luxurious for the second and especially the third class passengers. Like the original ship, passengers will be split up into three classes and prevented from mingling, but it is expected that they will be able to swap around after a few days.

The Titanic II, will be designed and project managed by the Finnish company Deltamarine and built by a leading state-owned Chinese company, CSC Jinling Shipyard which since 1996 has built vessels for customers from more than 20 countries. The decision to choose a Chinese company has prompted scepticism from some about how achievable the project is and how safe the end product will be. The issue has even been raised in Chinese government-backed newspapers.

Deltamarin will be responsible for coordinating the various parties involved in the project including the shipyard, architects, interior designers and operations managers. They will also undertake a full review of the Titanic II project to ensure the vessel will be compliant with all current safety and construction regulations. Like the original ship, there will no TVs aboard and probably no Internet service, but it will be fitted out with air conditioning and modern safety equipment.



Quality Assurance

By Rear Admiral D G (Spike) Spickernell CB — Part 1

This is the path that led me to produce the then totally new concept called Quality Assurance. As so often happens, it began with tragedies, the loss of the submarines Truculent and Affray, and an explosion in the engine-room of the submarine Alderney when I was on board. As the Submarine Trials Officer I was meant to be in the Truculent when it left Sheerness for sea trials after a refit but was delayed by an X-craft trial in Devonport that did not go according to plan.

On arrival at Sheerness I reported it to the Semaphore Tower and soon after found myself aboard H M S Cowdrey interviewing survivors from the Truculent as they were picked up from the sea. I was also at sea in the Affray the day before the submarine sailed on its last voyage. I always stressed that the dockyards were not at fault. It was the system that was wrong, basically because there was no system. Everything was too departmentalized.

As a result of my experiences as Submarine Trials Officer I was appointed to Portsmouth Dockyard in charge of submarine refits and immediately found another and glaring weakness - there was absolutely no feedback. Despite my two years of conducting trials after refits and reporting fully the problems I had encountered, I found the dockyard was totally unaware of this. There was no feedback whatsoever between user and supplier.

Promoted to Commander, I did four years at sea as Squadron Engineer Officer Frigates and then Squadron Engineer Officer Submarines before being appointed Superintendent Underwater Weapons Launching Establishment, Bournemouth, and then Deputy Captain Superintendent Admiralty Underwater Weapons Establishment, Portland. Here is a list of the things I learnt from these appointments, which later became part of my QA philosophy.

a) There was little or no feedback between those who specified the requirements and the scientists who did the research and development. I therefore instituted a procedure known as 'stage chart procedure' to bring both sides together at regular meetings with formal agendas, which included design review, provision of spares, handbooks, and training for the future users. The latter eventually attended these meetings.

b) It is essential to do costings at the earliest possible stage in development to ensure fitness for purpose at a cost that can be afforded.

c) Concepts must be cradle to grave and include reliability and maintainability costings.

d) Good equipment sent into service without the appropriate operating instructions and handbooks can soon get a bad name.

e) Equipment for testing made in the workshops and laboratories of an R and D establishment bore little relationship to equipment made by the contractor who put in the lowest bid. Hence the need to assess the contractor's procedures, processes and controls before allowing a company to tender. This checking would need to assess a company's 1financial strength and controls, as it would be catastrophic if a contractor went bankrupt whilst building a ship.

f) In order to maintain the quality of a product during its active life the above controls would be necessary in those companies and dockyards chosen for maintenance and refits.

Promoted to Captain, I spent two more years in Portsmouth Dockyard before becoming Commanding Officer of HMS Fisgard, the Engineering Apprentice Training Establishment in Cornwall. This was the appointment I loved most of all in my 38 years in the Navy. Then came the breakthrough that was to change my life and eventually led to ISO 9000 which is now used in 160 countries, where the registrations of companies, hospitals and schools, training establishments, police forces and many other facilities now totals more than a million.

A new post, Deputy Director Naval Ship Production, was created in the Ministry of Defence (Bath), to head a unified overseeing service, to study the reasons for the success of the Polaris programme and to incorporate the new philosophies in the large programme of warship building taking place at that time. I was appointed and gave the whole project the title 'Quality Assurance'.

So began the long haul that years later would become my life's work, namely to improve the quality of goods and services throughout the world and above all to aid the transfer of technology to developing countries. The first documents I used were of American origin, GRAQs (general requirements for the assurance of quality in ships) and SCITs (standard conditions of inspections and tests). Despite their names these were not QA documents as they did not include any reference to design and called for quality control procedures to be put in place after a contract had been placed. However, they were a start and I do not belittle them in any way.

The first surface ships to be built in which full QA procedures were implemented were the Type 21 and 42 frigates, which have now come to the end of their 25-year lives. In the event it was found that their operational periods between refits could be extended from two years to five years, thus more than doubling their operational availability. Huge savings came from the small extra outlay necessary during the design and build phases. At the same time and in addition to my duties in the Ministry of Defence, there was a government-to-government contract to assist India in setting up a warship building industry in Mazagon Dock Bombay and to build a Leander class frigate.

I was appointed to manage the project from the British input and handled it by getting Yarrows and Vickers, the shipbuilders controlling the contract, to break the work down into small packages containing full QA requirements. The Indians did their work efficiently and the Nilgri was launched in due course by Mrs Gandhi, who invited me to lunch, a very great honour. Thus began my desire to assist countries that wished to develop technically. Later on I was to handle contracts to modernize the standards organizations of China and Saudi Arabia and also became an honorary director of the Turkish Standards Institute. I have also lectured in nearly every country in the world.

Then came the breakthrough that would one day lead to ISO 9000. The Ministry of Defence (Whitehall) was concerned at the huge costs of maintaining 16,500 civilian inspectors in factories and shipyards throughout the United Kingdom. They set up an independent committee of industrialists and consultants in 1968 to examine the system and make recommendations. The committee recommended that the purchasing organizations of the Army, Navy, Air Force and Ministry of Technology should adopt the quality assurance procedures used by the Navy and that I should head up a small team in London to produce and implement the new procedures. Needless to say, only the Navy thought this a good idea! However, thanks to political pressure, the committee's recommendations were accepted and in 1970 I found myself promoted to Commodore, sitting in an office in the Ministry of Technology London with a small team of civilians drawn from the three services. I reported to the newly formed Defence Quality Assurance Board, a truly formidable team. The Permanent Secretary MoD, Chief Scientist MoD, Controller Navy, Controller Aircraft, Master General Ordnance, to name but a few.

The introduction of QA across the MoD was not going to be easy! However, my small team and I got on with our task, which was to produce the documents necessary to ensure contractually that the staff in the field would be permitted by the defence industry to assess its capability before contracts were placed. At the same time I carried out an exhaustive lecture tour to get the support from industry that was not coming from the Board. After all, it had been industry that had originally claimed that there were too many government inspectors on their premises. Because of the industrial support received the team's confidence grew and the necessary documents were quickly produced. But by what means could they be introduced? The Director General Defence Contracts was a most helpful man but could not use them because although compliance would mean a company was able to tender it did not mean that it would ever get a contract.

It was Geoffrey Souch, a key member of my staff, who came up with the answer. Let us produce them as Defence Standards. And so they were published as Defence standards and 05-21, 05-24, and 05-29. They were later to become BS 5750 and then ISO 9000. I was promoted to Rear Admiral in 1971 and given the title Director General Quality Assurance. My team then produced a highly coloured brochure, which was sent to over 30,000 companies entitled “The New Requirements for Defence Quality Assurance”. Things were now moving forward.

Training of the staff to be employed in quality auditing was carried out by two eminent American consultants, namely Joe Juran and Marvin Johnson. I was invited to visit NASA Houston to study the procedures and processes that led to their success. I also became friendly with John Riordan, the head of QA in the Pentagon, to whom I was always grateful for the following advice: 'You can tell industry what you expect of them but never how to do it.' On my return to the United Kingdom the Defence Standards were modified to take account of what I had learned. I have always believed that you can achieve anything as long as nobody wants to take the credit. Thus there was very much an international input in these new defence standards and this was acknowledged.

After 38 years service the time came for me to leave the Navy in 1975. I joined the British Standards Institution and soon became Technical Director, responsible for the production or all standards. The reason I joined the British Standards Institution was because when I gave a lecture at Rolls-Royce Derby, Bob Feilden approached me. He was then Director General of the British Standards Institution and told me not to take a civilian job without contacting him first. At the British Standards Institution I was responsible for all standards. At that time there were 10,000 committees in being with some 30,000 committee members. There was not much time for quality assurance.

Part—2 will be published in the next edition of the Bulletin.

Society Accounts

ROYAL NAVAL ENGINEERS' BENEVOLENT SOCIETY

Receipts and Payments Accounts for the Year Ended 31/03/2014

		2013	2014
RECEIPTS.			
Contributions, less refunds to members accounts:-		£16,301	£16,102
Rents 113 North Hill, Plymouth:- (incl Agency Fees)		£15,816	£20,380
Savings a/c interest	Term Investment Bonds / Building Society:-	£21,994	£21,999
	Barclays Bank, Business a/c :-	£1,258	£18
	Coventry / Poppy Bond 2013	£1,120	£2,106
Insurance Premium Recovery:-		£424	£408
Donations:- (Including Auction income) + Sales income.		£0	£380
	Total Income:-	£56,913	£61,393
PAYMENTS.			
Bulletin			£5,576
Newsletters Production, Printing and Postage		£5,372	
Managing Secretary's Expenses:-		£619	£529
Managing Secretary's Salary:-		£4,800	£5,250
Assistant Man Sec's Expenses:-		£178	£379
Assistant Man Sec's Salary:-		£650	£1,250
Executive Council Expenses:-		£1,797	£530
General Secretary's Honorarium & Expenses:-		£2,425	£3,290
Property Repair, Maintain & Furnish:- 113 North Hill Plymouth:-		£13,023	£3,558
Agents Fees, New Lets & Inspections:- (Incl VAT).		£1,563	£1,156
Insurance Premiums:-		£1,199	£1,020
Rates: Business & Water (& Elec):-		£956	£984
Death / Invaliding Benefits / Retiring Bonus:-		£6,530	£3,024
Accountants / Auditors:-		£964	£944
Income Tax:-		£572	-£1,265
Recruiting Expenses (Note Books) and presentations		£1,029	£1,988
Capital Expenditure		£350	
Office Eqpt, Hardware / Software / Maintenance:		£861	£1,282
Donations (& Prizes):-		£300	-£300
Bank Charges:-		£0	-£50
New Year Lunch			£148
Solicitors Fees:- (lease renewal, land search, member services, etc.) & Surveyors fees.		£0	£1,300
Outstanding Debit / Credit:-			
	Total Expenditure: -	£43,188	£30,592
	Income brought down: -	£56,913	£61,393
	Profit / Loss: -	**£13,725**	**£30,802**
Principality B.Soc. Bond, 5yrs @ 3.75% (to Nov 2016)		£199,809	£199,814
Principality B.Soc. Bond, 5yrs @ 5.00% (to Jan 2015)		£400,000	£400,000
Coventry B.Soc. Poppy Bond (bought 2011, matures 30 September2014):-		£40,000	£140,000
9th Issue Index Linked National Savings Certificate:-		£10,000	£10,000
Barclays Bank, Business Saver Account:-		£116,500	£41,518
Barclays Bank, Current Account (Subs):-		£377	£2,622
Barclays Bank, Current Account (Rent):-		£372	£3,908
Cash In Hand:-		£3	£0
	Total Accumulated Funds: -	£767,060	£797,862
	Creditor/Debitor	£50	£0
	Profit / Loss: -	**£13,727**	**£30,802**
Property: 113 North Hill (as Valued Dec 03):-		£240,000	£240,000

Accountant: Sheppards, Plymouth. Auditors: Mr T Worsfold & Mr R Lampen

President: Mr M. Stevens, Portsmouth Section. Managing Secretary: Mr D. Fletcher

Campaign Medals Awarded for WW1

There were five campaign medals available for individuals who saw service in the First World War. An individual, male or female, could be issued with a maximum of three of these medals, although there are a small number of exceptions to the rule.

Service medals were issued automatically to other ranks, but officers or their next of kin had to apply for them. In addition to the five campaign medals the Silver War Badge was available to officers and men who had been honourably discharged or had retired as a result of sickness or wounds from war service.

The 1914 Star, established in April1917: This bronze medal award was authorized by King George V for those who had served in France or Belgium between 5th August 1914 to midnight on 22nd November 1914 inclusive. The award was open to officers and men of the British and Indian Expeditionary Forces, doctors and nurses as well as Royal Navy, Royal Marines, Royal Navy Reserve and Royal Naval Volunteer Reserve who served ashore with the Royal Naval Division in France or Belgium.

A bronze clasp bearing the dates '5th AUG. - 22nd NOV. 1914' shows that the recipient had actually served under fire of the enemy during that period. About 41% were issued with the clasp.

Recipients who received the medal with the clasp were also entitled to attach a small silver heraldic rose to the ribbon when just the ribbon was being worn. There were approximately 378,000 1914 Stars issued.

The 1914-15 Star, established in December 1918: This bronze medal, being very similar to the 1914 Star, was issued to a much wider range of recipients i.e. those who served in any theatre of war against Germany between 5th August 1914 and 31st December 1915, except those eligible for the 1914 Star. Similarly, those who received the Africa General Service Medal or the Sudan 1910 Medal were not eligible for the award.

Like the 1914 Star, the 1914-15 Star was not awarded alone. The recipient had to have received the British War Medal and the Victory Medal. An estimated 2.4 million of these medals were issued.

The British War Medal 1914-18, established on 26th July 1919: The silver or bronze medal was awarded to officers and men of the British and Imperial Forces who either entered a theatre of war or entered service overseas between 5thAugust 1914 and 11th November 1918 inclusive. This was later extended to services in Russia, Siberia and some other areas in 1919 and 1920.

Approximately 6.4 million silver British War Medals were issued and around 110,000 of a bronze version were issued mainly to Chinese, Maltese and Indian Labour Corps.

The Allied Victory Medal: It was decided that each of the allies should each issue their own bronze victory medal with a similar design, similar equivalent wording and identical ribbon.

The British medal was designed by W. McMillan. The front depicts a winged classical figure representing victory. Approximately 5.7 million victory medals were issued. Interestingly, eligibility for this medal was more restrictive and not everyone who received the British War Medal also received the Victory Medal.

The Territorial Force War Medal 1914-19, instituted on 26th April 1920: Only members of the Territorial Force and Territorial Force Nursing Service were eligible for this medal and had to have been a member of the Territorial Force on or before 30th September 1914 and to have served in an operational theatre of war outside the United Kingdom between 5th August 1914 and 11th November 1918. An individual who was eligible to receive the 1914 Star or 1914/15 Star could not receive the Territorial War Medal.

The reverse of the medal has the words TERRITORIAL WAR MEDAL around the rim, with a laurel wreath and the words inside the wreath FOR VOLUNTARY SERVICE OVERSEAS 1914-1919. Approximately 34,000 Territorial Force War Medals were issued.

The Silver War Badge, issued on 12th September 1916: This badge was originally issued to officers and men who were discharged or retired from the military forces as a result of sickness or injury caused by their war service. After April 1918 the eligibility was amended to include civilians serving with the Royal Army Medical Corps, female nurses, staff and aid workers. Around the rim of the badge was inscribed "For King and Empire; Services Rendered". It became known for this reason also as the "Services Rendered Badge". Each badge was also engraved with a unique number on the reverse, although this number is not related to the recipient's Service Number. The recipient would also receive a certificate with the badge. The badge was made of Sterling silver and was intended to be worn on the right breast of a recipient's civilian clothing. It could not be worn on a military uniform. There were about 1,150,000 Silver War Badges issued in total for First World War service.

The Mercantile Marine War Medal, established in 1919: The Board of Trade awarded this circular bronze campaign medal to people who had served in the Merchant Navy and who had made a voyage through a war zone or danger zone during the 1914-1918 war. The reverse of the medal has a laurel wreath around the rim with an image of a merchant ship on a stormy sea with an enemy submarine and an old sailing ship to the right of the merchant ship. The inscription on this side of the medal is FOR WAR SERVICE/MERCANTILE MARINE 1914-1918.

The green and red colours of the ribbon represent the starboard and port running lights of a ship with the centre white colour being representative of the masthead steaming light. 133,135 Mercantile Marine War Medals were awarded.

Camcopter S-100 Unmanned Air System (UAS)

Camcopter S-100 is an unmanned air system (UAS) designed and developed by the Austrian based company, Schiebel. The system unit can be deployed for a variety of missions including border patrol, reconnaissance, search-and-rescue, countermeasures, smuggling, route surveillance, convoy protection, damage assessment, task forces, pollution monitoring, minefield mapping, and other command-and-control operations.

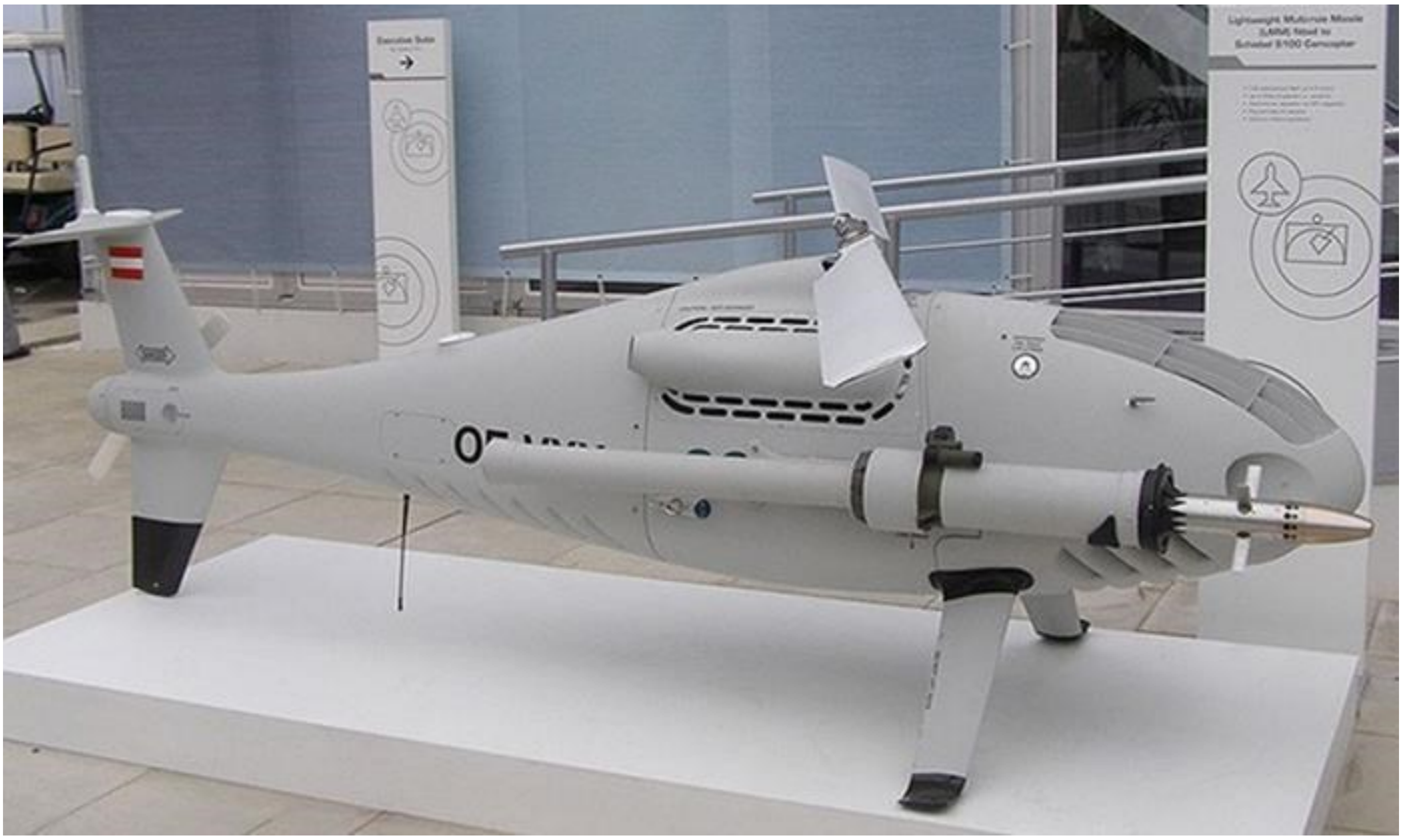
The UAS secured a ‘Permit to Fly’ from the European Aviation Safety Agency in June 2007 and in February 2014, Schiebel received a contract from the Italian Navy to provide a Camcopter S-100 air system, training, integration and spares for anti-piracy missions. The UAS successfully demonstrated its maritime capabilities from a Dutch Navy vessel in the North Sea in April 2014.

The S-100 has automatic vertical take-off and landing capability and can perform operations in all weather conditions. It can operate on its own or as part of an intelligence, surveillance, target acquisition, and reconnaissance network in joint operations.

The unmanned system has a length of 3.11m, main rotor diameter of 3.4m and height of 1.12m. The maximum take-off weight of the UAS is 200kg, while the empty weight and payload capacities are 110kg and 50kg respectively. The UAS can carry 57 litres of fuel in the internal tanks and also carries an external fuel tank. It can be optionally fitted with a harpoon deck capture system for use with any NATO grid.

The S-100 is equipped with two payload bays and an auxiliary electronics bay. The stabilised day and night electro-optical / infra-red sensors and thermal surveillance equipment help capture high-definition images, which are transmitted in real-time to the ground control station (GCS) via a line of site data link having a 180km range.

The system can carry synthetic aperture radar, maritime radar, ground penetrating radar, signal intelligence and communication intelligence communication relays, ATMID all terrain



mine detector, LIDAR scanners, loudspeakers, transponders, dropping containers and under-slung loads.

The UAS is also equipped with Remotely Operated Video Enhanced Receiver (ROVER) system for surveillance and two side payload hardpoints.

The system navigates using an inertial navigation system and GPS, and is fitted with Riegl VQ-820-GU Hydrographic Airborne Sensor, a Thales I-Master radar system, a CORONA 350 airborne sensor and a Shine micro automatic identification system.

The S-100 is controlled by a Ground Control Station (GCS) equipped with two laptop computers, an intelligent interface, control screen and a control station. The GCS is used for mission planning, processing, retrieving and storing the information provided by the unmanned system.

The S-100 is powered by a Wankel-type rotary engine, which produces 50hp running on 100 octane-grade avgas or 95 octane lead-free petrol. The drone can be optionally powered by Schiebel's heavy fuel engine, which supports the use of JP-5 (F-44), Jet A-1 (F-35) and JP-8 (F-34) fuels. The UAS has a maximum air speed of 130kts and a typical cruise speed of 100kts. It can execute missions up to six hours, flying at a loiter speed of 55kts with a payload of 34kg. The air system has a service ceiling of 18,000ft in international standard atmosphere (ISA) conditions and can operate in temperatures ranging from -40°C to +55°C.

The price of an S-100 vehicle alone is $400,000 and the fuel system price including two air vehicles, the control station, payload, ground equipment, training, and logistics package will cost around $2 million.

Also, Thales UK is developing a new lightweight multirole missile (LMM) that will offer a low-cost precision-guided strike capability for helicopters and unmanned air vehicles such as the S-100. Test firings of the 13Kg missile have already been performed from a suspended Camcopter without disrupting its handling characteristics. Powered by a Roxel two-stage solid propellant motor and to carry a 3kg blast/fragmentation warhead, the LMM is planned to have a unit cost of just 50-60% that of a Starstreak missile. Guidance will initially be provided using a laser seeker, with three of the weapon's forward wings having independent steering. However, Thales plans to later integrate a low-cost semi-active laser being developed within the company, or possibly introduce an INS/GPS terminal homing capability. The laser proximity fuse allows the missile to be used against low metal content targets like inflatable and semi inflatable small craft.

Electrodialysis, the next great desalination technology?

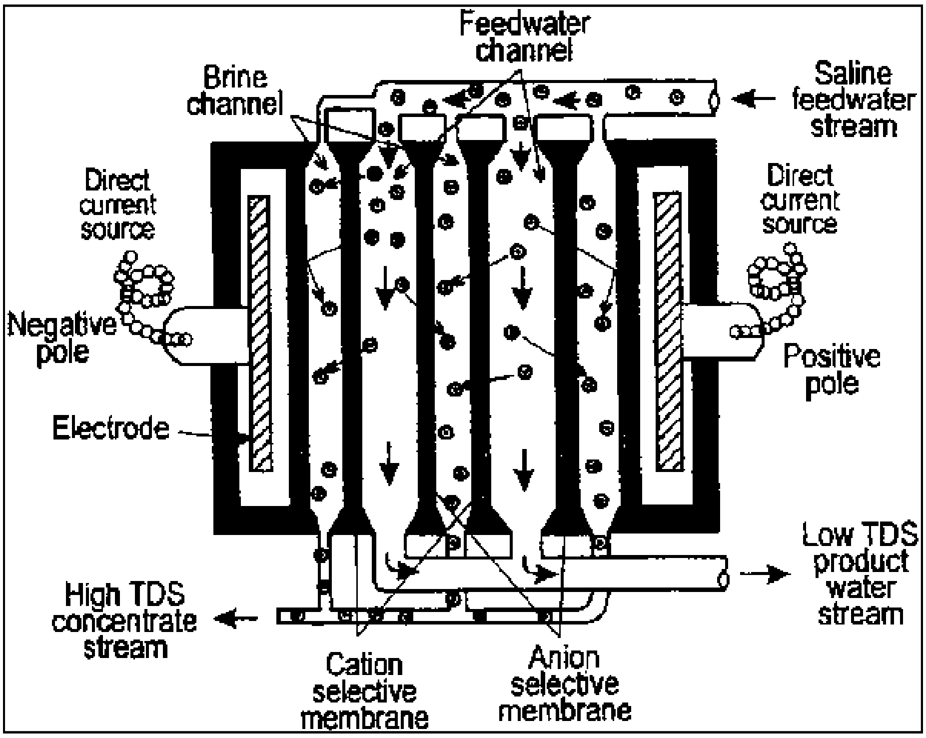
Is electrodialysis the next great desalination technology?

Possibly, according to the *MIT Technology Review*. Electrodialysis "works by allowing sodium and chlorine ions to pass through a membrane in the presence of an electric field, leaving purified water on the other side," the report said.

The basic electrodialysis unit consists of several hundred cell pairs bound together with electrodes on the outside and referred to as a membrane stack. Feed water passes simultaneously through the cells to provide a continuous, parallel flow of desalted product water and brine that emerge from the stack. Depending on the design of the system, chemicals may be added to the streams in the stack to reduce the potential for scaling. Electrodialysis (ED) is only an economical process when used on brackish water, and tends to be most economical at TDS (total dissolved solids) levels of up to 4 000 to 5 000 mg/l. Most of the electrodialysis units sold use a variation of the basic process known as electrodialysis-reversal (EDR). Electrodialysis units have a waste discharge of brackish water ranging in volume from 10% to 50% of its output of freshwater. The feed water must be pre -treated to prevent materials from entering the membrane stack that could harm the membranes or clog the narrow channels in the cells. Post-treatment consists of stabilizing the water and preparing it for distribution by removing gases such as hydrogen sulphide and adjusting the pH.

The effectiveness and efficiency of electrodialysis units is generally measured by the amount of water produced per kilowatt hour (kWh) of electricity used. Usually more than one membrane stack in series is required to achieve adequate reduction of the dissolved salts. Each stack reduces the TDS by about half. Thus a properly designed 4-stack array could reduce a feed water of 4 000 mg/l total dissolved solids content to about 250 mg/l.

The electrodialysis process has the advantage of being simple to use, and, since the product water does not go through the membrane and the passages through the membrane stack are larger, the process is less apt to scale or be plugged with debris. This is a good technology to use when the feed water is likely to contain an high concentration of suspended solids. The process requires little chemical pre-treatment of the source water, and is quiet compared to thermal and reverse osmosis units. Electrodialysis has the capability of achieving high recovery volumes (more product and less brine), with the amount of energy used being proportional to the mass of salts removed. It is also not affected by non-ionic substances such as silica.



100th Anniversary of the Panama Canal

Summer marked the 100th anniversary of the opening of the Panama Canal, the 48-mile shortcut between the Atlantic and Pacific that allows ships to pass between the Atlantic Ocean and Pacific Ocean, saving about 8000 miles (12,875 km) from a journey around the southern tip of South America, Cape Horn.

The Panama Canal has connected the world since August 15, 1914 and about 14,000 ships now transit the canal each year, reaching 1,700 ports in 160 countries. The construction of the Panama Canal was possible through the contribution of more than 56,000 men and women from all around the world. It takes approximately fifteen hours to traverse the canal through its three sets of locks (about half the time is spent waiting due to traffic). Ships passing through the canal from the Atlantic Ocean to the Pacific Ocean actually move from the northwest to the southeast, due to the east-west orientation of the Isthmus of Panama.

From 1819, Panama was part of the federation and country of Colombia but when Colombia rejected United States plans to build a canal across the Isthmus of Panama, the U.S. supported a revolution that led to the independence of Panama in 1903.

The new Panamanian government authorized French businessman Philippe Bunau-Varilla, to negotiate a treaty with the United States. The Hay-Bunau-Varilla Treaty allowed the U.S. to build the Panama Canal and provided for perpetual control of a zone five-miles wide on either side of the canal.

Although the French had attempted construction of a canal in the 1880s, the Panama Canal was successfully built from 1904 to 1914. Once the canal was complete the U.S. held a swath of land running the approximately 50 miles across the isthmus of Panama.

The division of the country of Panama into two parts by the U.S. territory of the Canal Zone caused tension throughout the twentieth century. Additionally, the self-contained Canal Zone (the official name for the U.S. territory in Panama) contributed little to the Panamanian economy. The residents of the Canal Zone were primarily U.S. citizens and West Indians who worked in the Zone and on the canal.

Anger flared in the 1960s and led to anti-American riots. The U.S. and Panamanian governments began to work together to solve the territorial issue. In 1977, U.S. President Jimmy Carter signed a treaty which agreed to return 60% of the Canal Zone to Panama in 1979. The canal and remaining territory, known as the Canal Area, was returned to Panama at noon (local Panama time) on December 31, 1999.

Additionally, from 1979 to 1999, a bi-national transitional Panama Canal Commission ran the canal, with an American leader for the first decade and a Panamanian administrator for the second. The transition at the end of 1999 was very smooth, for over 90% of the canal employees were Panamanian by 1996.

The 1977 treaty established the canal as a neutral international waterway and even in times of war any vessel is guaranteed safe passage. After the 1999 hand-over, the U.S. and Panama jointly shared duties in defending the canal.

Closure of the RNEBS Affiliated Charities

At the EC meeting, held in June, it was agreed by all that the RNEBS would take over the responsibility for the provision of prizes formally sponsored by the registered charities, The Chatham Memorial Fund and Captain Marrack Prize. All related charity accounts will be liquidated and the monies transferred to the RNEBS general account, as the RNEBS has been a major contributor of funds over the years. It is intended that the General Secretary will take on the mantle for establishment liaison and distribution of prizes going forward.

Jon Jefferis has been the corresponding trustee and treasurer for both the Chatham Memorial Fund (since 1998) and Captain Marrack Prize funds (since 2005). Jon was presented by RNEBS President, Chris Heaver, with a cut glass ship's decanter engraved with the Society's crest and an inscription that reads "Presented to Jon Jefferis by the Royal Naval Engineers' Benevolent Society".

US Coastguard to supply engineers to man the Type 23's

Beginning in October, several enlisted Coast Guard men and women will join their seagoing counterparts from the U.K. to support the manpower needs of its Type 23 frigates. Coast Guard Commandant Admiral Paul F. Zukunft and First Sea Lord and Chief of Naval Staff of the U.K. Royal Navy Sir Admiral George Zambellas signed a memorandum of understanding which aims to strengthen the maritime partnership between the United States and the United Kingdom.

Navy chiefs are said to be "very embarrassed" at the situation. But without the US engineering support, several Type 23s would not be able to be used on operations.

The American engineers will undergo special training to prepare for their 36 month tours. The scheme will end in 2019. The Navy is already offering "golden hello" payments of up to £45,000 for key engineering staff, but some have continued to leave and new recruits cannot be trained in time to fill the gap.

With the end of artificer training in the RN, this was an inevitability and should come as no real surprise to those people who made the decisions to end the role of the artificer. Other branches of the armed services have tried the same cost cutting exercises, have failed and then had to reinstate the training of these professional engineers—the backbone of the RN.