flash

SUMMER 2014 ISSUE 21

TRINITY500
SERVING THE MARINER
1514 – 2014

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Trinity House

The Corporation of Trinity House

Master – **Her Royal Highness The Princess Royal** KG KT GCVO

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Captain Nigel Palmer OBE MNM *(Nether Warden)*
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Jon Price Esq, *(Secretary)*

editor's note

This summer issue of ***Flash*** is my last, and by the time you receive it I will be finding my feet in a new position. I wanted to take this opportunity to thank you all for your support and contributions over the nearly nine years I have been at Trinity House. It has been an amazing experience and this is mostly due to the people I have been fortunate to work with and meet over this time. I leave you in the extremely capable hands of ***Neil Jones*** who I am sure will make this magazine go from strength to strength.
Please send any submissions to him by 12th September 2014.
He will look forward to reading them!
Wishing you all the very best,
Vikki Gilson.

For updates between issues please visit
our website **www.trinityhouse.co.uk**
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Cover image: Southwold Lighthouse is a coastal mark for passing shipping and guides vessels into Southwold Harbour. The lighthouse is situated near the centre of the seaside resort of Southwold, midway between Lowestoft and Orford, the round white tower stands amongst rows of small houses. Construction began in 1887 and the present lighthouse came into operation in1890. The character and range of the lighthouse changed in 2012 with the main light being increased from 17 to 24 Nautical Miles.
Photo credit: Nick Chapell


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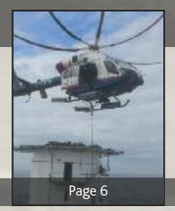
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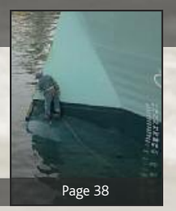
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Captain Ian McNaught

AS I WRITE WE ARE MIDWAY through our 500th anniversary year. There are still a number of events to come in this year of celebration and commemoration as we mark the granting of our Charter by Henry VIII in 1514. I am pleased that so many of you will be participating in this special year. In April HRH The Princess Royal, Master of the Corporation, officially opened the new community hub at Mariners Park in Wallasey. The building and facilities there represent one of the biggest grants made by the Corporation to a seafarers' charity. I know this haven on the Wirral will be regarded as a fine example of charity by seafarers for seafarers.

Above: *At the National Maritime Museum Greenwich on 15th April HRH The Master, accompanied by Vice-Admiral Sir Tim Laurence, opened a small exhibition, entitled Guiding Lights, introducing the work of the Corporation of Trinity House to coincide with the quincentenary.*

Above: *HRH The Master presided at a grand quincentenary Trinitytide Dinner held in the City of London's historic Guildhall on 11th June and attended by the 450 members of the Fraternity and guests from across the international and national maritime communities as well as our own Service, the City of London and City Livery Companies. The evening opened with a Beating of the Retreat by the Band of HM Royal Marines and was followed by a reception and dinner.*

Later that same month the Master visited the National Maritime Museum Greenwich to open *'Guiding Lights'* the museum's excellent exhibition about our 500 years of serving the mariner. This free exhibition runs until 2016 and if you have the opportunity I recommend a visit to see it.

In this edition of *FLASH* you will see much on progress in various branches of the Service, particularly the engineering disciplines involved in Casquets and Nab lighthouses, the Planning Centre at Harwich, and there is an article about how our lightvessel fleet is maintained.

In refurbishing and modernisation offshore lighthouses built many years ago the task is frequently complicated by the weather as well as by difficulties in access and delivery of materials. These contracts have been achieved in the face of extreme weather.

In the Planning Centre we have undertaken a redesign and reorganisation to meet the challenges of the coming years. From our Harwich base we now monitor the aids to navigation provided by our sister authorities, Commissioners of Irish Lights and the Northern Lighthouse Board, out of hours.

The sound maintenance of our lightvessel fleet by our current staff, and their predecessors, means we benefit from great longevity of our lightvessel hulls; 50 years is certainly not unique.

Our activities as a General Lighthouse Authority continue to be recorded with material in *FLASH* by the R&RNAV experts who, by the time you read this, will have returned from the IALA Conference in A Coruña, Spain with other members of the Trinity House team and where the worldwide membership from more than 80 states will have been briefed on a full range of Trinity House activities.

As I write there are a number of other events anticipated eagerly in the months ahead, not least of which is a banquet in London's Guildhall. We also have planned events to raise funds for the Corporate charity, including abseils, endurance cycling and dragon boat racing.

To celebrate further Neil Jones, the Records Manager, has produced a fine 60-page A4 publication and this complements *Light Upon the Waters* by Captain Andrew Adams and Captain Richard Woodman, the sales of which I understand are going well.

To close for the summer I send you my very best wishes for you, ashore or afloat and look forward to writing again as we approach the year's end.

Ian McNaught

a review of the last six months at TRINITY HOUSE

JANUARY

THERE IS NO DOUBT THAT THE PAST WINTER was extreme and yet sufficient solar power was found to keep all stations illuminated. However, there were a number of weather-related incidents over December to January. In particular two light vessels and four buoys were found more than 100 metres off station and were soon restored. There were a number of other significant casualties including loss of topmarks, all of which were eventually rectified.

© Paula Evans, www.scillyweb.com © Nick Chappell, St Just.

An amazing record of the extreme weather over last winter.
Top: *At Longships repairs were put in hand to the landing.*
Middle: *Storm at Godrevy.*
Lower: *Red can topmark is missing from the Bartholomew Ledges Beacon.*

FEBRUARY

IN RECOGNITION OF ITS 500 YEARS' SERVICE to the Admiralty Court, the Corporation has been presented with a replica of the Admiralty Oar Mace. The presentation took place at the Admiralty Court in the Royal Courts of Justice, on 12th February and was attended by the Deputy Master and Elder Brethren.

Above: *Captain Ian McNaught (left) received the replica Admiralty Oar Mace from The Hon. Mr Justice Teare, The Admiralty Judge.*

The Elder Brethren of Trinity House have been serving the Admiralty Court as Assessors for in the region of 500 years. In their definitive history of Trinity House, *Light upon the Waters*, the co-authors Captain Richard Woodman and Captain Andrew Adams, state that Thomas Spert, first Master of Trinity House and master of the *Henri Grace à Dieu* is recorded as having sat in the Admiralty Court in 1536 as an Assessor, the first recorded instance of a specialist nautical assessor assisting the judge, a duty carried out by the Elder Brethren to this day.

The presentation of this replica Mace to the Corporation recognises one of the oldest and most important duties of Trinity House.

From left to right, Michael Everard, Chairman of the Lights Advisory Committee; the Deputy Master, Alderman Sir Paul Judge of Tower Ward and Joshua Eldridge, from Trinity House Harwich, the youngest member of the Trinity House Service.

Above: *On 24th January panels depicting milestones in the Corporation's history since its founding in 1514 were unveiled at Trinity House and will remain in place for the remainder of the year for the benefit of the huge numbers of tourists visiting Tower Hill.*

APRIL

ON 4TH APRIL HRH THE MASTER opened the magnificent multi-million pound state-of-the-art new welfare facilities for former seafarers at Nautilus International's Mariners' Park Estate, Wallasey on Merseyside.

Above: *HRH The Master opening the Trinity House Hub at Mariners' Park, Wallasey.*

She formally unveiled the new Trinity House Hub, a £4.1m project of 18 fully-accessible apartments for older seafarers and their dependants, along with community facilities including a café, a spa, a gym and rooms for meetings and hobbies. This has been built as part of a programme of new developments at Mariners' Park, which has been providing support and services to seafarers in need since 1857. The Hub includes a new care home, flats and bungalows for retired seafarers.

Captain Ian McNaught, commented, *"Throughout our 500 years we have had at the core of our organisation the principle of serving the mariner, past present and future. These new facilities are excellent and I am extremely pleased we have been able to contribute over £2m to provide them. They are a great legacy and will provide former mariners and their dependants with comfortable communal spaces that contribute to the feeling of community here for a long time."* Nautilus General Secretary, Mark Dickinson added, *"I believe that this building will provide a suitable commemoration for this anniversary for many decades to come."*

AT THE NATIONAL MARITIME MUSEUM GREENWICH on 15th April HRH The Master, accompanied by Vice-Admiral Sir Tim Laurence, opened a small exhibition, entitled *Guiding Lights*, introducing the work of the Corporation of Trinity House to coincide with the quincentenary and in which 70 rarely seen objects from the Museum's collection and our own are on display.

MAY

SATURDAY 17TH MAY saw Trinity House open from 1000 to 1500 when interested visitors were able to wander at their leisure and receive information from expert guides stationed throughout the building. Said Edgar King, Events Manager, *"More than 500 visitors joined us and we found that many were relatives of, or knew of, people who worked for Trinity House and included one young man who has worked in THV* Galatea *for six months. A very good day."* Enthusiasts unable to visit on this day can schedule a visit from 1000 to 1500 on Saturday 20th September, as part of the Open House London promotion created by Open-City (www.open-city.org.uk).

ON 20TH MAY WE CELEBRATED the 500th anniversary of the granting of the Charter by Henry VIII in 1514. There was an informal service of Thanksgiving in the Corporation's church, St Olave's, at 1100 at which the Preacher was the Rector, the Rev Oliver Ross. A reception followed at Trinity House during which Mrs Susan McNaught, wife of the Deputy Master christened our new Thames Waterman Cutter *Trinitytide*.

Christening of the Thames Waterman Cutter Trinitytide by Mrs Sue McNaught, on 20th May.

THE PREVIOUS DAY THE ROYAL MINT announced that to mark this milestone it had produced a limited edition commemorative Trinity House-themed £2 coin in sterling silver and 22 carat gold. This carries a striking lighthouse design by Joe Whitlock Blundell and David Eccles. The design also appears on the circulating version of the £2 coin which you will doubtless find in your loose change from October. Each coin is edged with the words *SERVING THE MARINER*.

The Trinity House-themed £2 coin.

JUNE

HRH THE MASTER PRESIDED at a grand quincentenary Trinitytide Dinner held in the City of London's historic Guildhall on 11th June and attended by the Fraternity, 450 guests from across the international and national maritime communities as well as our own Service, the City of London and City Livery Companies. The evening opened with a Beating of the Retreat by the Band of HM Royal Marines and was followed by a reception, then dinner.

Above: *The Royal Marines Beat Retreat before the Guildhall Dinner on the night of 11th June.*

THE QUINCENTENIAL TRINITYTIDE was held at Trinity House on 12th June when HRH The Princess Royal was re-elected Master of the Corporation for the ensuing year.

Captain Ian McNaught was re-elected Deputy Master. Mr Simon Sherrard was elected Rental Warden and Captain Nigel Palmer was elected Nether Warden. At conclusion of the Court HRH The Master with the Elder and Younger Brethren proceeded to St Olave's Church, Hart Street, for the Annual Trinitytide Service where the preacher was the Rt Rev and Rt Hon Rowan Williams, former Archbishop of Canterbury.

Above: *The Annual Trinitytide Procession, 12th June.*

BY **Simon Millyard**, ENGINEERING AND OPERATIONS MANAGER, TRINITY HOUSE

Nab Tower Engineering Works 2013 – 2014

NAB TOWER IS AN IMPORTANT PHYSICAL AID TO NAVIGATION and the turning point for all major shipping entering the Solent, this includes super tankers heading for Fawley refinery and huge cruise liners bound for Southampton. Nab tower is located in the eastern approaches to the Solent (50°40'.05N 00°57'.07W), built for the Admiralty in Shoreham from hollow concrete sections and steel in 1918 as a gun emplacement but it was never used in anger.

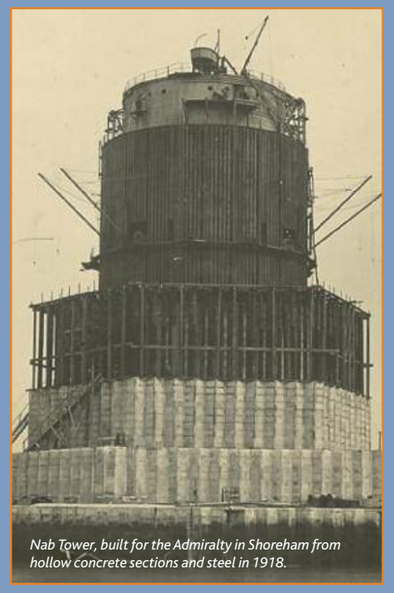
The structure was made redundant due to the end of the First World War and was floated out into position in 1920 to replace the Nab lightship. On settling to the sea bed the tower took on a 2.5 degree list which remains to this day.

Trinity House occupied part of the tower from the 1920s onward, the structure staying under MoD control. The MoD formed the helicopter deck and internal reinforced concrete caisson prior to Trinity House acquiring the freehold in 1984.

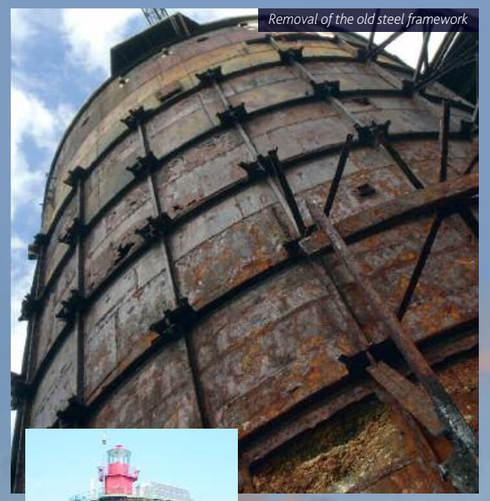
The tower was automated with keepers withdrawn in 1983 and converted from diesel to solar power in 1995. The refurbished Nab Tower will exhibit an all-round 12 nautical mile white light at 16 metres above LAT with racon and a two mile range fog signal.

Over recent years Nab Tower has deteriorated rapidly with the external steel structure corroding beyond economic repair and becoming a hazard to staff entering it for maintenance.

After looking at many options which included a new monopile structure, a Type 1 buoy, and a lightvessel, the business case and the navigational requirements firmly pointed to a major refurbishment of the existing structure. The remodelled tower has a design life of 50 years during which time no significant expenditure is expected on the structure itself though the aid to navigation will require updating and new batteries during this time.



Nab Tower, built for the Admiralty in Shoreham from hollow concrete sections and steel in 1918.

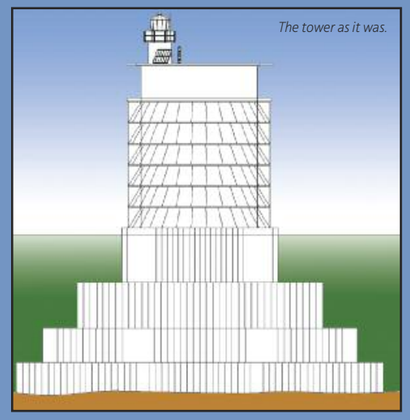


Removal of the old steel framework

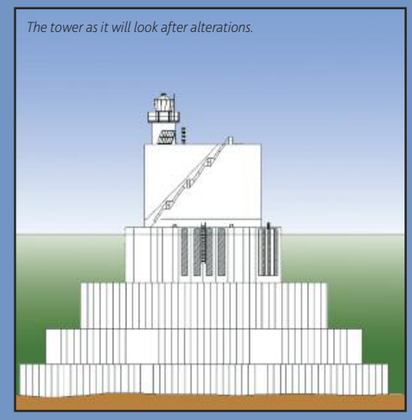
***Left:** A shadow of its former glory, the Nab Tower at the start of the project in early 2012.*

***Main Picture:** Nab Tower as at November 2013 with tower crane shown exposed as the tower height has been reduced, this is how it was left over the winter 2013/2014. Note the temporary Type 1 buoy to the left marking the unlit structure.*

***Above:** April 2013. THV* Galatea *loading equipment onto Nab Tower to commence the demolition works. Here the temporary mobile crane is about to be loaded on, the crawler crane was used to erect the tower crane that was central to the works throughout the project.*



The tower as it was.



The tower as it will look after alterations.

The tower was constructed on a concrete honeycomb structure with three circular rings forming the main tower. The inner ring was the steel ammunition riser and 8 feet in diameter, the middle ring also in steel at 30 feet diameter and the outer section a mixture of steel and concrete forming the structure that remained up to 2013. The very outer 55 foot diameter section was timber clad on a steel frame but the sea took its toll on the timbers and replacing them as they were washed away was an impossible task.

Final design solution for the refurbishment was developed with Trinity House Engineers and Civil Engineering Consultants Scott-Wilson and consisted of reducing the overall height of the structure from 23.5 metres to 11.5 metres and the removal of the rusted outer steel framework and cladding. This would be finished with a new concrete cap to take the new aid to navigation and a sprayed concrete gunite protective layer to the outer wall.

After a comprehensive tender exercise and analysis of the best value solution, the contract for these works was given to BAM Nuttall. Work commenced in the spring of 2012 with preparatory works, however, a peregrine falcon was found to be using Nab as a hunting ground and possibly nesting there so works were suspended until after the breeding season. Peregrines are a protected species and it is illegal to disturb them without a licence and by the time this was ascertained we had missed much of the good weather so the main works were deferred until the spring of 2013.

In April 2013, THV *Galatea* skillfully loaded all the required equipment onto Nab, this included the tower crane which was to be essential for the refurbishment works plus compressors, generators, cement mixers and in effect a whole mini building site onto the Nab. Over the summer, the concrete flight deck which was some 400mm thick was nibbled away and removed piece by piece for recycling ashore. Also the outer steel frame and cladding was removed and the concrete structure prepared ready for the gunite spray.

A comprehensive waste management plan was drawn up to ensure that all possible materials removed from the tower would be reused or recycled rather than sent to landfill.

This is the largest expenditure on a single station for Trinity House since the construction of Royal Sovereign Lighthouse off Eastbourne in 1971.

***Below:** The new aid to navigation on soak test in Swansea Buoy Yard with twin 12 mile light and solar array. The fog signal and radar beacon (racon) are not shown.*

***Above:** May 2013, the tower crane is erected and extends to the base of the old ammunition shaft. The removal of the old steel framework is progressing.*

The summer of 2013 proved to be very challenging in terms of weather. Wave height restricted our access to the tower from the launch and once on board, the tower crane had restrictions on wind strength in which it could operate. In spite of reviewing the past two years' weather and wave height data to assess the number of useful days work we could expect over the summer, the number of days that the tower was inaccessible was more than expected so the works had to be rescheduled to be completed in 2014.

By the end of November 2013, the tower was at its new height and diameter but awaiting the pouring of the new cap and spraying of the gunite to protect the outer shell. There are also some outstanding minor works to the lower deck and landing.The new aid to navigation has been redesigned and rebuilt and placed on soak test in Swansea Buoy Yard awaiting being craned back into position by THV *Galatea*, a task planned for July 2014.

BY **Simon Millyard**, ENGINEERING AND OPERATIONS MANAGER, TRINITY HOUSE

Casquets Lighthouse **Modernisation**

CASQUETS, ALONG WITH BISHOP ROCK LIGHTHOUSE, is a major landfall light for shipping heading up the English Channel. Located on the Les Casquets rock 11.3 km west of Alderney in the Channel Islands the station has just completed a major modernisation and has "gone green". A two year project run by Steve Keddie, Programme Manager at Trinity House's Engineering Department in Harwich, has been completed resulting in the elimination of the use of fossil fuels used in delivering the aids to navigation and reducing the number of planned maintenance visits.

This project was completed to a high standard and with particular attention to the management of the works on site as is required on such a remote location. Attention to detail on Safety Management paid off with zero accidents throughout the installation works, a credit to all involved.

Reducing Casquets' environmental impact

The near 300 year old (built 1724) lighthouse was automated in 1990. The navigation equipment was powered by continuously running diesel alternators which used approximately £7000 of diesel every year. Due to the advancements in renewable technologies the station is now powered purely by solar panels and wind turbine power generation.

Engineering aspects

The Project Brief required the design team to produce a reliable aid to navigation with a low maintenance commitment and zero carbon footprint with a life in excess of 20 years. After a thorough analysis of options and many design reviews by the Engineering Team at Harwich, the agreed plans incorporated the following aspects:

- The main navigation light uses a new six-sided LED light array from the R&RNav Department, this is fitted in the existing rotating optic.
- An external LED lantern of the same range as the main navigation light as a backup if required.
- A PLC (programmable logic controller) to control and monitor the station's performance. This reduced installation costs and time.
- 22 x 180 Watt solar Photo Voltaic panels. These are larger than the previous service standard and reduced the footprint of the solar array.
- Provision for a monitoring system for the solar array to determine any faulty panel prior to visiting the station.
- A bank of gel lead-acid batteries to power the station, these are sealed and have significantly reduced maintenance requirements.
- A stand-alone battery bank to power domestic services through an inverter when staff are on station; this eliminates the need for a diesel power supply and is supplied by the wind turbine.

Above: *Helicopter underslinging operations.*

Modernising the equipment

The diesel engines and associated controls and aids to navigation were installed during the station automation in 1990 and were becoming obsolete and expensive to maintain. The modernisation programme replaced the majority of this equipment and ensures that reliable systems are in place to reduce the risk of station failure. This will maintain Casquets as a major aid to navigation for the next 20 years.

Main picture: *Wind turbine power generation installation.*

Right: *New lantern roof arrangement with the 18 NM standby lantern and radar beacon (racon).*

Below: *New boat landing.*

In line with navigational requirements the station light changed from 24 nautical miles range to 18NM. This was achieved using new technology LED lanterns for both the main and standby light sources. The station also changed from 24hr operation to night time only. The new technology benefits from lower power requirements and significantly higher mean time between failure rates. This reliability gives the additional benefit of reducing the number of planned maintenance visits each year.

Restoring safe and cost effective access

During the time that the station was manned, the boat landings which are made from the island's bedrock and concrete were constantly maintained by the lighthouse keepers to give safe access to the island by boat. However, now that the station is attended infrequently these landings are wave washed and a build-up of slippery algae means that the landing has become difficult to use. The modernisation provided a new landing made from stainless steel and extra-grippy waffle board providing access to the island by boat though it is likely that the first choice of access will be by helicopter due to the prevailing sea state conditions.

Work on site

Following a detailed scoping and design phase, installation work commenced on Casquets rock during May 2011. A major logistical task was embarked upon to procure and deliver all the parts required by the installation team. The parts were delivered to the Casquets area by Trinity House tender *Galatea* and transported the short distance from the tender to Casquets rock by Trinity House helicopter. The helicopter flew in excess of 110 underslung loads to deliver the equipment onsite.

Installation was carried out by Trinity House's Field Operations Staff working on three-week phases at a time with relief by local boat or helicopter. Technicians were drawn from the entire Service to deliver the work programme safely over the two year period. Works were suspended during the winter months to maximise the use of good weather and extended daylight.

The work to install the landing stage was made particularly difficult by the tide-dependent access to the landing site and by the challenge in cutting a level mounting for the designed steelwork out of the island's granite. The fully installed boat landing platform can be seen above left.

Casquets from afar.

Above: *Sealed gel batteries and racks.*

Above: *Helicopter underslinging operations.*

The lantern roof

The corroded roof ventilator section was cut off and a new top complete with hand rails was constructed and painted in Harwich Buoy Yard. This now houses the new Racon, AIS and the 18 mile standby light. The yellow handrails are manufactured from GRP to avoid interfering with the Racon performance.

With the removal of the old lantern roof went a small piece of history, the ventilator section had a large bullet hole in it from a German fighter plane during the Second World War.

Power supplies.

The main source of power for the station is now an array of solar PV panels generating up to 6 kW of power on a sunny summer day with a battery storage capacity of 4,000 Ampere hours. This is supported by a 2.5 kW wind turbine making free use of the wind for winter months.

The combined generation will power all the aids to navigation and building conditioning and has the capacity to provide for domestic services when staff are on station for maintenance. The power generated is stored in new type sealed gel batteries which reduce the need for maintenance visits.

Control and automation

The station is completely automated with control and monitoring managed by a PLC. This monitors all selected parameters such as battery voltage, power being generated and status of the aids to navigation as well as allowing the station to be remotely controlled from the Planning Centre in Harwich.

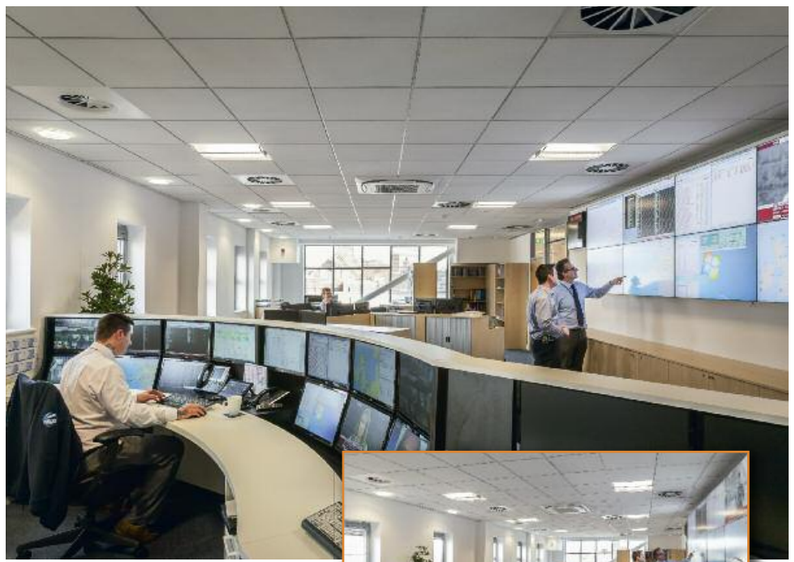
The project was formally signed off and handed back to the Lighthouse Manager Warren Clarke by Commodore Jim Scorer, Director of Operations in January 2014.

Calm now returns to Les Casquets rock as the new aids to navigation continue to quietly offer safe passage to shipping as it has done for the last three centuries.

BY **Kevin Dace**, IT MANAGER, TRINITY HOUSE

Monitoring ***Progress***

WHEN THE OPERATIONS AND PLANNING CENTRE (OPC) was conceived in 2004, it was designed as modern facility to house four monitoring staff with IT and Audio Visual (AV) functionality. In time we would subsequently take on out-of-hours monitoring on behalf of the Northern Lighthouse Board (NLB) and the Commissioners of Irish Lights (CIL) in 2011 and subsequently plan to further integrate the planning aspect into the department's functions.



Top: *The busy but cramped nature of the previous PC office space.*

Above and right: *The new and completed Planning Centre showing the duty officer's monitoring desk and the bank of planning desks.*

Ten years on we found ourselves again looking to the future as the project to relocate OPC to a new purpose-designed, ergonomic planning and monitoring space within the Harwich building moved forward.

With the expansion of IT in 2011, it quickly became apparent that there were ergonomic issues. These were tackled alongside a study into the operating and staffing patterns of OPC. The latter through the use of internal skills to review OPC whilst the ergonomic issue was passed to external specialists, CCD.

More to monitor

A working group consisting of management, OPC and IT staff worked alongside the ergonomic experts to examine options for office layout, other requirements, ergonomics, and desk layout to maximise interaction of staff and expand operational capability. This first phase concluded that the current OPC space was no longer fit for purpose.

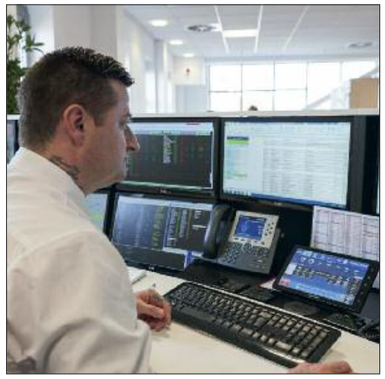
The second phase consisted of looking for alternative OPC locations within the Harwich office building and designing a floor/desk layout and technical monitoring function. The overall design brief was to provide an operations, monitoring and planning space for seven people suitable to conduct monitoring now and into the future with an integrated and expanded planning function. All this was to deliver maximum efficiency from our receding resources.

Design and build

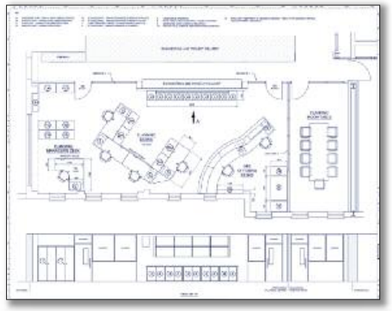
As the project moved forward and the Executive Committee approved the outline report and proposals from CCD, a formal internal project team was assembled consisting of Engineering, IT and OPC representatives. All relevant staff were consulted to gather detailed requirements for the new OPC and these were captured, assessed and either approved or declined. Due to the relocation of OPC within the building it was inevitable that other staff would be affected and relocated and these were also included in the consultation.

The next stage involved the use of architects and quantity surveyors to prepare the design and budgetary elements of the proposal whilst the IT team defined the complex IT and AV requirements to provide a state-of-the-art monitoring and planning centre.

The design shows how office space was configured to allow collaboration within the team and to allow all staff to view the audio visual 'video wall' – the planned centrepiece of the new OPC giving a flexible technology solution to share and view many different types of electronic material on a video wall measuring 4.1m x 1.2m.



Left and above: *The design of the office space was configured following collaboration within the team and it allows all staff to view to advantage the audio visual video wall, the planned centrepiece.*



Centre: *The agreed layout of the Operations and Planning Centre taking the key elements from the CCD study and incorporating them alongside the architects' plan to fit into the first floor office space that was, at the time, occupied by R&RNAV.*

Lower: *This picture shows the space for the new build created after R&RNAV relocated to their new office space.*

Alongside this, a bespoke designed desk for the duty officer would house numerous monitoring screens in an ergonomic manner whilst still allowing full interaction within the office and video wall. Adjacent to the main room, a planning room is located which will have multiple functionality including: planning space for OPC; a holding area for visitor tours; an emergency room for dealing with incidents and a general planning/meeting room for the use of all other departments.

Two separate competitive tender processes commenced in August 2013, one overseen by architects to appoint a main construction contractor and another run by IT in order to engage IT AV experts. Detailed specifications were drafted and agreed. Abacus Build was awarded the construction contract following their successful involvement in previous projects within our buildings at Harwich and experienced specialists proAV won the AV contract.

During December 2013, the IT team worked closely with proAV to develop the detailed design which consisted of a digital AV solution built around a Digital Media Switcher. This offers ultra-fast digital video and audio switching, and lossless HD multi-room signal distribution, for all types of AV sources with up to 32 input sources and 32 output destinations.

In our installation, the input sources come from multiple monitoring systems (for our service, NLB and CIL), digital TV feeds, digital signage solutions, local inputs from planning PCs and CCTV feeds.

From technology to furniture experts

The next step was to source a suitable manufacturer with which to work on the design of all of the OPC furniture including the showpiece monitoring desk which had the requirement to ergonomically provide monitoring of up to 14 local screens. Learning from lessons of previous projects we were aware that extremely close interaction between IT, the AV contractors, furniture manufacturers, builders and electrical consultants was required. This led us to appoint AvenueF as the preferred furniture supplier due to their track record of working with proAV. They would work in close liaison with Abacus and the M&E contractor, Bowling & Garrard.

Over many meetings, emails and discussions, the furniture was finally agreed just before Christmas 2013. The digital AV solution allows the operations officers to choose where to display monitoring information including replicating required data onto the video wall or into the planning room.

As with all projects such as this no element could be overlooked. This included numerous items from screen design for the touch panel digital switch controller to provision and accurate positioning of power and data requirements into and under desks and all things in between.

Planning the transition

During January 2014, with furniture being manufactured, work continued apace in the new OPC suite with many trades working together. In order to ensure that the level of electrical continuity was maintained, for example, power to the department is guaranteed via UPS and generator during a power failure to the building, significant electrical work was required. Alongside this, solutions to re-route CCTV, Access Control and various communications cabling had to be planned and arranged bearing in mind the critical requirement that the current OPC must remain fully functioning. Solid team work lightened the headaches.

At this point planning for the actual transition commenced along with designing a full test schedule to ensure all equipment was fully functioning before the move.

Finally, we turn an eye to re-use of the existing monitoring equipment screens. Rather than dispose of them we will be looking to relocate them as part of a future project to ensure that we have full disaster recovery plans to fulfil our GLA out-of-hours monitoring commitments to NLB and CIL.

In conclusion

All went well, exactly as planned with completion of the building work, installation of IT and AV components, trials, prayers, and more prayers and the new OPC, now named Planning Centre, was inspected by the Deputy Master and members of the Court when they met in Harwich on 13th May. As I write all is performing to order ready for the official opening by HRH The Master on 25th June.

BY **Gavin Johnson**, TECHNICAL SUPERINTENDENT, TRINITY HOUSE

Automatic lightvessel maintenance

TRINITY HOUSE USES LIGHTVESSELS to mark the boundaries of major traffic areas and significant hazards in the very busy shipping lanes of the English Channel, the southern North Sea and other isolated locations. The fleet of ten lightvessels and two smaller light floats represents a unique convergence of 1950s shipbuilding technology and present day electronics and lighting systems. The oldest lightvessel in service, LV02, was built at Philip and Sons Dartmouth in 1946. The vessels were originally manned and have evolved through several fully automated unmanned solutions, from diesel power systems to solar. We are now on our first major revision of the solar powered system having moved from lead acid batteries to gel batteries with an intelligent charging system which greatly enhances the battery life and hence reliability of the station.

The major step changes in the power source and its management are but the summit of improvements made to the vessels over the last 20 years; always aiming toward greater efficiency, autonomy and time on station. The following outlines some of the changes made and the overall effect.

Removal of redundant structures.

Masts, flight decks, covered side passages, davits, to name but a few. All these items were originally retained for good operational reasons and removed during the late '90s and early 2000s. This resulted in an approximate 10% reduction in area to be coated including the very costly flight deck coating system. Along with these removals the costs of associated mechanical overhauls, net stay and stanchion maintenance were all reduced or removed.

Changes in paint systems

When first automated the vessels were coated underwater with a hot applied bituminous enamel and above waterline with a chlorinated rubber system. This achieved an on station life of approximately four years before the effects of corrosion and, particularly, fading of the superstructures dictated the vessel required repainting.

Systems were changed to more durable two pack coatings during the 1990s and have been revised over the intervening years to take advantage of improvements to anticorrosive systems, both above and below waterline, and better gloss retention for topsides and tower coatings.

An on station period of ten years has now been proven viable, creating very significant savings over the original four year period. We have three vessels that have completed their first ten year tour with no ill effects. The most striking difference the bystander would recognise is the change in colour from the traditional Post Office red or cherry red to the IALA standard *"Pure Red,"* a very bright colour giving much enhanced conspicuity of the vessel in comparison with the traditional colour.

Subtle Changes

Through analysis of the most common defects on the fabric of the vessels, we determined that there were a number of areas giving constant cause for unscheduled visits to the vessels and others that tended to increase the dependence of the vessels on the Support Vessel Service (SVS) fleet of tenders. As a result particular attention has been given to weathertight closures, all doors and access hatches now have stainless steel compression faces, hold-backs, dogs and locking plates. This has improved seal reliability and station accessibility. On a larger scale it was determined that the original capstan system for adjusting the cable on station was inadequate and that the means of making fast the anchor cable (a huge double bollard on the foredeck) was both time consuming to use and hazardous through the heavy duty manual handling required to manipulate chain cable on and off the bollards. This resulted in the up-rating of the existing capstans and the associated diesel-hydraulic prime mover from 8.5 tons line pull to a maximum line pull of 18 tons. It is now possible to handle both the towing chain and the main riding mooring complete with the 5 ton anchor fully independently of the support vessel.

Heavy duty gate stoppers were fitted on the foredeck removing all but the slightest amount of manual handling necessary, when lifting, deploying, checking, or adjusting moorings. These and many other minor initiatives delay or even arrest the deterioration of the vessel fabric reducing the need for intervention required both in terms of periodic, docking maintenance and regular in service maintenance.

➥ *Continued on page 12.*

Above: *After nine years on station, looking for'ard from the lantern gallery.*

Above: *Photographed during commissioning of the new gimbal mounted LED MSM light in a 20 Class lightvessel and showing overall configuration. The manufacturer was Mediterráneo Señales Marítimas of Spain.*

Above: *In the lantern of a 20 Class lightvessel the LED MSM aid to navigation provides a 15mile light and comprises 11 rings of 10 LEDs each.*

Main Picture: *Leaving dock with new paint job. Regarding moorings, typically the weight would total five tonnes which would be represented in the buoy yard by a stack six feet high and four feet wide. Weight per metre of 44mm diameter links is 44kg/m equivalent to two bags of cement. Lightvessels carry up to 550metres of chain cable as moorings. Each link is 264mm in length and 158mm wide and weighs in at approximately 8kg.*

Automatic lightvessel maintenance *continued from page 11.*

Above: *This photograph of LV09 was taken last year before coming off station for refit on an uncharacteristically calm day in mid-summer. Note the old colour.*

Above: *Typical conditions after nine years on station, looking aft from the lantern gallery.*

Electrical Systems

Similar challenges have been met and overcome in terms of reducing the electrical systems' maintenance load. This has been achieved through close attention to the detail of failures and application of modern technology. Each lightvessel carries systems that generate and store electrical energy, those that report the vessel's position and status as well as those that carry out the prime function of marking the station. All these electrical and electronic systems operate in a very inhospitable and corrosive environment. Such systems demand the highest standards of engineering especially as they must all operate reliably in the ambient conditions aboard.

Perhaps one of the more interesting challenges has been the development of the main light from the rotating optic with1500Watt lamp fitted in the diesel powered vessels through to the LED lamps fitted in the latest lightvessels.

Originally with the relative availability of power from the diesel prime movers a 1500W lamp could be sustained, this was backed up by a secondary lamp set, which was housed on the rotating table above the optic and further supported by an emergency lamp on the roof of the lantern house. On the first round of solarisation a gimballed table to take the optic was fitted. The gimbal was arranged to keep the lantern as level to the horizon as possible and take out the effects of ship motions (nothing new). This enabled a narrower beam to be used which enabled us to deliver the station lighting character with power available from the stored electricity generated by the solar arrays. By using a metal halide light source we were also able to fit a lamp changer enabling us to dispense with the secondary light. However, an emergency light of compatible power characteristics with the solar system was still needed.

The latest revision takes advantage of new lighting technology and has two equal range LED lanterns mounted on a compound pendulum arranged as main and secondary lights in a flashing rather than rotating configuration to deliver the character. Loom of a rotating lantern is simulated by a lower level light provided during the dark period of the flash. Advantages gained from this configuration are a reduction in the overall power requirement by virtue of the removal of a need for a rotating optic and in the unlikely event of a lantern failure, the secondary equal range lantern reduces the urgency of intervention as the station light range and character are unaffected.

The result is a greatly enhanced reliability, energy efficiency is achieved and the need for an emergency light is negated.

Maintaining light vessels at sea

Over the years it became apparent that as a result of the increasing complexity and dependence on electrical and electronic systems aboard the Trinity House tenders it was necessary to employ Electro Technical Officers. Having access to such skilled personnel we have been able to take advantage of their skills and carry out first line on board maintenance of light vessels directly from the SVS tenders. This has added a degree of flexibility not previously available to us. Additionally, ship's personnel are supported by the Field Operations Department where their specific knowledge is required. Further technical support is readily available through the technical department for more intractable issues.

The status of all lightvessels is monitored through the on board telemetry system which enables the Monitoring Officer in the Trinity House Planning Centre to check for, and be alerted to, defects aboard the vessel. The Monitoring Officer is also able to control all aspects of the aids to navigation system. We are able to see if the main light is functioning correctly, see the status of the fog signal, we have real time location monitoring. In other words we can see that the vessel is at its assigned position and at the other end of the scale we can identify if the bilges have been flooded and even if the vessel has been run down. Through the telemetry system we can monitor the charge state of the all important battery banks and analyse this data through trending software. This long distance Formula 1 type technology enables us to more accurately assess the need for intervention aboard the lightvessels and tailor our response more efficiently.

The maintenance load aboard is organised through the Planning Centre and based around two scheduled visits made to each vessel annually, one in spring the other in autumn. During these two attendances, vessel husbandry inspection work (that is all non-electrical systems' maintenance), the annual technical inspection to service the electrical systems and the annual moorings maintenance are carried out. Additional visits are scheduled based on level of need to attend to defects arising that are reported through the telemetry system or through user observed reports. Importance of these defects is graded to give a level of response and resolution necessary to maintain the navigational availability of the light vessel within the statutorily required limits.

Organisation of all visits is scheduled and organised as a team effort between ship's personnel, Planning Centre and the Supplies Department whose crucial role is to source and draw together all the parts necessary to clear outstanding defects and carry out regular maintenance. It is through close attention to detail that vessel attendances are minimised and the goals of performance are achieved.

BY **Georgina Button**, ACCSEAS PROJECT COMMUNICATIONS OFFICER

ACCSEAS 2014 Conference e-Navigation on North Sea radar

ACCSEAS, AN EU-FUNDED PROJECT to support improved maritime access to the North Sea Region through minimising navigational risk, welcomed over more than 80 regional and international shipping experts to Edinburgh for its second Annual Conference, held in March.

This event presented an array of e-Navigation test-bed solutions, all of which are aimed at increasing accessibility and improving navigational safety in the increasingly busy shipping waters of the North Sea Region. Spanning three days, the Conference included demonstrations of potential e-Navigation solutions including the Vessel Operations Co-ordination Tool, the Dynamic Predictor, the Multi-Source Positioning Service and No-Go Area. The Conference also hosted a number of lively panel discussions and workshops that looked at the future training needs for e-Navigation, the implementation of future e-Navigation services and the critical issue of the impact of e-Navigation on the wider logistics chain.

The ACCSEAS Conference was officially opened by HRH The Princess Royal, in her capacity as Master of Trinity House and Patron of the Northern Lighthouse Board. In her remarks she commended the success of the ACCSEAS project and the progress already made by its partner organisations, *"It is a huge achievement that this number of countries have come together to achieve this and are driving maritime innovation forward. It is important that technical innovations happen within the maritime industry and this is the first time that such solutions are being brought to fruition in this way."*

Rear-Admiral Nick Lambert, former Hydrographer of the Navy, chaired the conference and commented, *"The second annual ACCSEAS Conference convincingly corroborated the vision and value of this project's unique approach to testing potential e-Navigation solutions that are of practical use to mariners going about their daily business. Lively discussion, great ideas and active engagement by articulate, focused and realistic international delegates endorsed the project's approach and encouraged further development over the next 12 months."*

Impressed by the value of conclusions reached, Michael Card, Deputy Secretary-General of IALA remarked that his organisation will draw on the excellent results of the ACCSEAS project in its current work of creating e-Navigation technical guidance for aids to navigation authorities.

Reaching beyond its focus of the North Sea Region, the ACCSEAS Project also caught the attention of representatives in the Asia-Pacific region, who were present at the Conference.

Mick Kinley, Deputy Chief Executive, Australian Maritime Safety Authority added, *"The excellent speakers and the presentations that were made at the Conference not only gave me an understanding for the first time of what e-Navigation actually is, but also showed that projects such as ACCSEAS are going to make e-Navigation a reality that the shipping industry needs to start preparing for today."*

In conclusion Alwyn Williams ACCSEAS Project Manager commented, *"The ACCSEAS conference proved to be a great opportunity for the stakeholders in the North Sea Region and beyond to come together to discuss the issues and potential solutions for improved accessibility for maritime transport in the region. I thank all the participants for their invaluable input into the discussions as it certainly helps to shape a better future for the users of the North Sea."*

The third and final ACCSEAS Annual Conference will take place next year from 17th to 19th February.

Top Left: *HRH The Princess Royal opens the Conference.*
Middle and lower left: *Networking at the sessions.*
Top Right: *Mick Kinley, Deputy Chief Executive, Australian Maritime Safety Authority.*
Lower Right: *Alwyn Williams, ACCSEAS Project Manager.*

Below: *The Conference venue; Our Dynamic Earth Science Centre, Holyrood Road, Edinburgh.*

Health and Safety – *How it was*

I JOINED TRINITY HOUSE IN 1968 from the Royal Aircraft Establishment, Farnborough and on Tower Hill was part of the Engineer-in-Chief's Department. By late 1972 with impending legislation that became the Health and Safety at Work Act 1974 I applied for and was accepted for the post of Safety Advisor within the Lighthouse Service, which duties I took up early the following year. Firstly I had to obtain a recognised safety certificate and this was achieved after a three week RoSPA course. One of the requirements was to write a dissertation entitled *"A new concept for safety within the Trinity House Lighthouse Service."*

***Dave Mayhead**, Trinity House Safety Advisor, visiting the Needles Lighthouse, September 1988.*

A word about legislation. HASAWA 1974 set out requirements for the health and safety of all people at work and in particular for the provision of training, protective gear and the regular inspection and review of almost all working practices and equipment.

This was new to us at every level of the Trinity House Service and whereas all concerned had always followed the safety route, there were now mandatory requirements which could not be avoided.

My dissertation was presented to the RoSPA management and I was questioned at length on the course. On my return to Trinity House my paper was submitted to the Board and an instruction sent to all Superintendents, to Blackwall Workshops and to other parts of the Service introducing me as the Safety Advisor.

As you can imagine, with four centuries of managing men and ships in often harsh conditions and to well tried systems some did not appreciate a young outsider coming in and telling them how the job should be done. I decided on the first day to inform all concerned that I would be visiting on a mutually convenient date to discuss the new Act and to keep them informed of my findings following inspection. This was not about catching people out but simply to comply with the legal aspect of the Act, the responsibilities of management and of an individual worker using the equipment provided for his own safety.

At that time the overall accident rate was low but there were specific areas of risk that needed attention, for example, noise, handling of mercury, ladders, first aid on lighthouses, fire equipment, use of lifejackets and more. At that time a larger helicopter than currently in use necessitated winching at some stations with attendant risk and so a routine had to be devised. In time survival suits were provided for use in the Bond helicopter "Tango Charlie" and further procedures devised along with fire fighting training.

A number of aspects of then current practice came to light which had to be rectified to comply with the Act. For example, keepers on rock light-houses had never been told to wear a lifejacket when climbing down to the setoff or landing steps as the risk had been obvious and at the time the only available appliance was the bulky kapok filled lifejacket soon to be replaced by the inflatable which became widespread.

All service ladders were examined, condemned where necessary, and replaced by more manageable step ladders or aluminium ladders.

Inspections were based on a two year cycle and regular safety meetings were chaired by senior staff with safety and trade union representatives.

In recent years it has been a pleasure to reflect upon what we achieved in those early days. It is a credit to the Service that Trinity House recently received a RoSPA Quality Safety Award for consistently high levels of health and safety management, for the third consecutive year.

Trinity House helicopter G-BATC (Tango Charlie), re-supplying Godrevy Lighthouse in 1974. This machine now operates in South Georgia.

Health and Safety - *How it is now*

AFTER THE RETIREMENT OF DAVE MAYHEAD, the reins were picked up by Roger Dean with the title of 'Health and Safety Inspector'. However, as well as maintaining the expected inspection role, Roger saw the need to develop a safety management system (SMS) and further, the benefits of getting this audited and accredited by an external body. It must be remembered that H&S legislation was still in development in the UK throughout the 1980s and new emerging industries meant new goal seeking challenges. The place of work was also very different and as an example, personal protective equipment for many people was a black donkey jacket and a safety helmet was not compulsory, even on construction sites. In 1974, UK industry was responsible for 651 deaths to employees, whereas today the latest figures show 95 employees were killed. This is still 95 too many, but it shows H&S management has come a long way and society is a great deal more intolerant of employers who do not operate safely.

In 1992 a further H&S milestone emerged in the form of the new 'six pack' suite of legislation to implement the harmonised H&S European Directives. Trinity House embraced this major change and further developed it's SMS to encompass the new requirements. Much of this work still forms the framework of our current SMS, albeit nearly all of those subjects listed have been subject to amend-ments and further legislation from EU Directives has snowballed since. However by the millennium TH was achieving a high standard in H&S management and obtained the highest RoSPA Quality Safety Audit Level 5 standard. H&S does not sit still and new regulations and codes meant new audit standards with deeper interrogation into not just documentation, but implementation evidence also. By 2006 the audit question sets and evidence requirements had doubled in size and although we suffered a minor blip, by 2008 TH was back up to Level 5 and has retained this ever since.

So what of H&S in TH today? H&S management within TH is a multi-layered process wholly committed to by every employee through to its directors. It is integrated fully within the individual departments with the aim of being in harmony with their opera-tional functions and achieving compliance as an organisation as a whole. To achieve this we have a 'just culture' and every person within TH is empowered to make a difference on safety matters. Everybody is encouraged to report mistakes (after all we all make them), so we can learn by them. There is considerable investment in H&S and job training to support this approach. The emphasis is on risk assessing any task or function and applying adequate controls, not wasting valuable effort and expenditure on insignificant risks. Given all staff now know what is expected of them and the standards to achieve, we now take a more behavioural analytical approach to near misses and non-conformance. H&S now is just a normal thread that runs through our daily operations in the same category as HR matters, IT, planning, finance, procure-ment and logistics.

What of the future? Due to the work of my predecessors, safety within TH has evolved from firm foundations and it will continue to evolve. By the end of this summer, to improve the efficiency of the process, it is planned to launch a faster reporting procedure for hazards and near-misses utilising smart phone technology. TH also plays an influential role in national and international consultations on draft legislation and standards, and not only in the maritime sector. The RoSPA audit is changing again to reflect changes in HSE guidance and the audit this November may set new challenges, but within TH H&S is nothing special; it is not a bolt on extra; it is a normal part of our business and basically, it is what we do to protect the welfare of all our employees, the seafarer, the public and the reputation of TH that has taken 500 years to build.

Working practices in the Buoy Yard and at sea. Trinity House observes the highest standards possible in industrial safety. This is ensured by a definite safety culture at all levels of the Service.

BY **Nick Ward**, GLA RESEARCH DIRECTOR

eLoran/eChayka for **polar regions**

THE CONDITIONS FOR MARITIME NAVIGATION in polar regions are changing and can be expected to lead to new seasonal shipping routes opening as the area covered by ice reduces during the summer months. There will be considerable commercial pressure to use this shorter route as an alternative to the conventional route via the Suez Canal. IMO produced guidelines for ships operating in polar waters in 2010, and is working to develop a mandatory polar code.

In polar waters, maritime services for prevention of incidents and accidents are especially important because of potential serious consequences of an incident in remote waters with limited infrastructure for SAR operations and combating of oil spills.

However, in polar areas it is difficult to maintain reliable systems based on traditional aids to navigation due to the extreme distances, sea ice and climate. Buoys and other installations may be damaged and/or moved by ice. Furthermore, shipping routes have to be flexible and able to be moved at short notice to take into account the shifting weather and ice conditions and local hydrographic conditions.

Therefore to establish safe and efficient maritime transport corridors in polar waters there is a need to develop and implement electronic maritime navigation, communication and traffic monitoring infrastructure, including radionavigation and communications systems, such as GNSS and AIS satellite. Development of virtual aids to navigation is one solution that should be given strong consideration.

Whatever solutions are adopted, conventional or e-Navigation, it is of utmost importance that new methods to mark safe waterways are internationally co-ordinated in order that mariners experience one internationally agreed system.

Left, above & main picture below: *Attending to physical aids to navigation in northern waters has difficulties as these images show, which are kindly provided by IALA Industrial Member SABIK OY, Finland (©2014) and its Russian experts Technomarine (©2014).*

Positioning Systems

Reliable positioning is essential to almost all e-Navigation services and reliance on electronic positioning could be greater in polar regions than in other parts of the world, simply because physical aids to navigations (AtoNs) are few and far between.

Global Navigation Satellite Systems, in particular GPS, have become the primary means of maritime navigation. However, GNSS are known to be vulnerable to interference, both deliberate and accidental. The inclined Medium Earth Orbits of the present GNSS can also result in poor geometry at high latitudes. The extent of these problems have been investigated and it can be concluded that accuracy is unlikely to be a problem for users in high latitudes. However, integrity (the ability of a system to warn of a malfunction) can only be provided by Receiver Autonomous Integrity Monitoring (RAIM) and this is not available on many maritime GNSS receivers currently installed. Space Based Augmentation System, such as Wide Area Augmentation System (WAAS) and European Geostationary Navigation Overlay Service (EGNOS) rely on Geo-stationary orbit satellites, which are not generally visible above 75 degrees of latitude at sea level. There are some ground-based, medium frequency DGPS stations in northern latitudes, but coverage is very limited.

The problem of interference to GNSS is not likely to be any worse at high latitudes, although solar storms can cause occasional scintillation, loss of lock and increased errors. Interference from faulty equipment is a general problem, but of course the consequences could be more serious if there are no alternatives available.

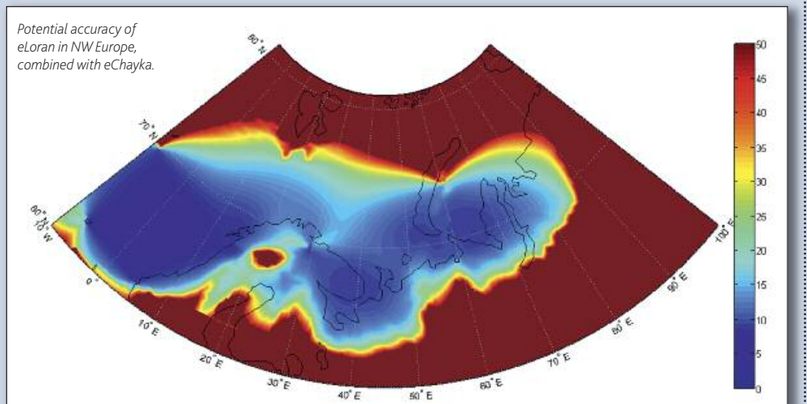
Existing maritime receiver standards are more than ten years old and do not reflect current technology. In particular they were formulated for individual, standalone systems, whereas modern receivers generally employ two or more position sources. For these reasons and to support the concept of resiliency essential for e-Navigation, development of a multi-system receiver performance standard is underway at IMO.

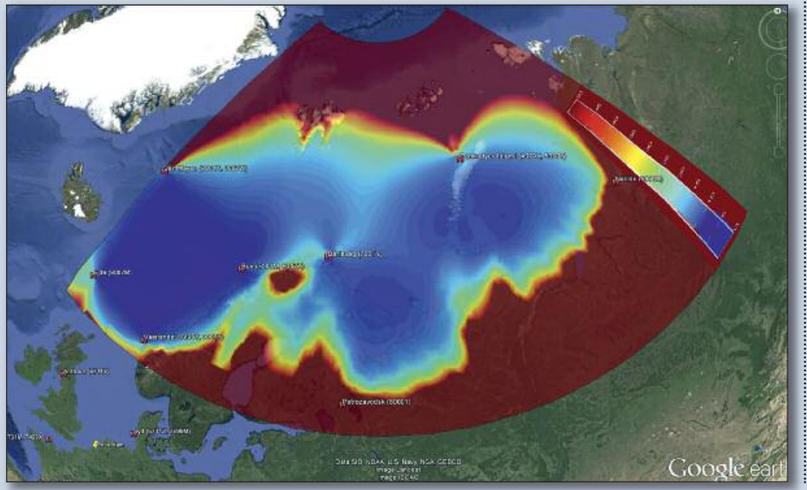
eLoran as a complement to GNSS

Enhanced Loran (eLoran) is a terrestrial navigation system developed from Loran-C. It is a Positioning, Navigation and Timing (PNT) service for use by land, sea and air navigation as well as other applications reliant on timing data.

eLoran is independent of, and has dissimilar failure modes, to GNSS and is therefore an ideal complement to it. It will allow GNSS users to retain the safety, security, and economic benefits of GNSS, even when their satellite services are disrupted. eLoran provides positional accuracy in the region of 8 to 20 metres and time and frequency performance (to stratum-1 level) similar to current GNSS. Ranges of individual stations are in the region of 1000km.

Potential accuracy of eLoran in NW Europe, combined with eChayka.





Above: *Coverage that could be provided by existing Chayka stations.*

Initial Operational Capability of eLoran is being implemented on the east coast of the UK, is being planned for the whole of the Republic of Korea and is under active investigation in Russia and several other countries.

None of the currently operating Loran-C stations covering Arctic waters has been converted to eLoran and their future is uncertain. The future of Chayka, the Russian equivalent that covers much of the Northern sea route, is under consideration and one of the options is to modernise and develop it to provide an eChayka service. If the Norwegian stations were modernised to provide eLoran and combined with enhanced Chayka infrastructure in Northern Russia, there is the potential to provide resilient PNT over most of the Northern sea route.

There have been positive discussions between the Russian Inter-navigation Committee and the General Lighthouse Authorities about co-operation on joint development of eLoran and eChayka. Information and co-operation has also been offered to Norway and any other nations interested in developing eLoran. Apart from providing performance comparable with GNSS, eLoran has greater availability and much lower cost than the old Loran-C system, which relied on manned stations and routine maintenance. In contrast eLoran operates continuously without human intervention.

Figures here show the coverage that could be provided by existing Chayka stations and the potential accuracy of eLoran in NW Europe, combined with eChayka.

Conclusions

Use of northern routes by shipping is growing, as polar ice recedes and pressure for oil and gas exploration increases.

There is little infrastructure to support communications and navigation in these regions and few conventional aids to navigation.

Deployment of e-Navigation services may be a rapid, cost-effective way to compensate for these deficiencies, improving safety of navigation and protecting the marine environment.

Such services must be supported by a resilient positioning system – GNSS alone is not robust enough and eLoran/eChayka is the only practical, complementary system within a realistic time frame.

Editor's Note: This article is partly based on material prepared for an IALA Workshop on Aids to Navigation in Polar Regions, held in Ilulisat, Greenland, in September 2013. Some of the text comes from the Guideline drafted at that Workshop. Information on potential eChayka coverage was provided by Russia at a meeting of the Far East Radio Navigation System (FERNS) in October 2013.

BY **Dr Nick Ward, Jan Šafář** and **Dr Alan Grant** – GENERAL LIGHTHOUSE AUTHORITIES RESEARCH & RADIONAVIGATION DIRECTORATE (R&RNAV) WITH TATSUYA KOJIMA, FURUNO ELECTRIC COMPANY AND PAUL MUELLER, TIDELAND SIGNAL CORPORATION.

Below, Figure 1: Racon on gallery.

Figure 2: Experimental radar installed in THV Alert.

Figure 3: THV Alert.

Absolute positioning by radar

RADAR POSITIONING IS SEEN AS AN ATTRACTIVE BACKUP OPTION FOR GNSS, because it is independent and potentially uses equipment that is already provided. However, there are a number of problems that would need to be resolved. Firstly the radars now fitted to the vast majority of vessels do not have the processing capability for absolute positioning and the radar aids to navigation (AtoNs), principally radar beacons (racons), only provide limited information about their identity – a Morse character that is not unique.

***Main picture, above and inset right,** Figure 4: Lowestoft Lighthouse.*

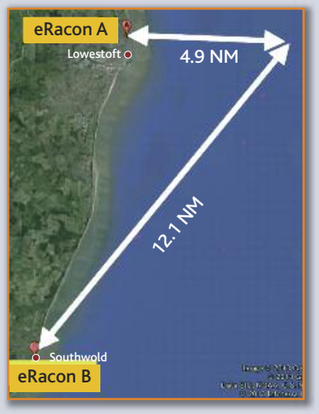
Suitable radars would need to be fitted to all vessels, sufficient enhanced radar AtoNs, giving a unique identifier and/or position, would have to be provided and standards would need to be brought into line. The trials reported here were carried out as part of the Resilient PNT Stream of the ACCSEAS Project and were intended to determine whether the technical problems could be solved. An assessment of the feasibility, cost and timescale for these developments has been carried out using the results obtained from the trials and this will be reported separately.

Trials location

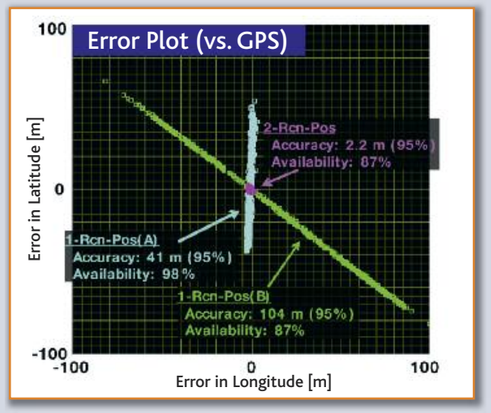
The trial radar was installed onboard Trinity House Vessel *Alert*, a 39m Rapid Intervention Vessel. Racons were installed on Lowestoft and Southwold lighthouses. These stations are about 10 miles apart on a relatively low-lying coastline, these being the criteria for their selection. The trials were carried out at distances up to 10 miles off the coast.

Trials plan

The trials took place over four days, the first day being taken up with equipment installation and testing and the last day with the removal of equipment. The second day was used for 'static' tests, with the vessel holding station at a number of points, at different distances from the racon locations. The third day was intended to be used for dynamic tests, sailing parallel with the coast through the trials area. In addition several 'static' tests were carried out, with the vessel rotating through 360°



Above, Figure 5: Trials plan.



***Above**, Figure 6: An example of an error plot.*

at a fixed location. Data processing associated with the radar used both range and bearing from the racons, to calculate position, combined with the latitude and longitude encoded in the racon responses.

Installations

The experimental X Band radar scanner and frequency down-convertor were installed on the starboard side of the monkey island see ***Figure 2,** far left, facing page.* The intermediate frequency signals were fed down to a digitiser in the wheelhouse for onward processing and recording. The scanner location meant that there was superstructure on its port side. This location was chosen after consultation between Furuno, R&RNAV and Trinity House Marine Section. It was not ideal, but the best position available without interfering with (or removing) the vessel's operational radars.

The racons were installed on the gallery rails of the lighthouses on the side oriented towards the trials area. Again the locations were not optimal, as there was some degree of masking and risk of reflections from the structure of the lanterns. However, these positions were considered the best available without providing a mounting point on top of the lantern roof. This would have involved scaffolding and access ladders, with unavoidable masking of the light. The racon positions were surveyed using a dual frequency GNSS receiver to an accuracy of better than 1 m and these positions were encoded by frequency-shift keying (FSK) modulation on the leading dash of the Morse 'D' character (-..).

Results

The summary of results given here is derived from observations on board the vessel and from post-trial analysis. During the trials the consequences of the sub-optimal installations were evident. Responses with the racons on the port side were limited because of the position of the radar. There were also sectors in which no racon responses were received because of blockage by buildings on the shore.

The calm conditions resulted in distinct nulls in the responses due to cancellation between the direct and reflected signals. This accords with conventional radar theory.

The appearance of the racon paints on the experimental radar was similar to that on the vessel's conventional radar. The first dash of the Morse 'D' character showed striations from the modulation, but was clearly distinguishable. There was considerable spoking when the vessel was close to a racon, probably caused by triggering from side-lobes and reflected signals.

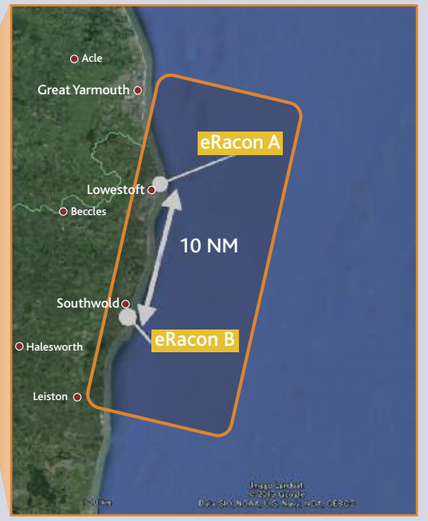
The maximum ranges at which the racons could be seen was about 20 miles, however, responses at these ranges were sporadic and inconsistent. The maximum ranges at which consistent responses were received varied between 8 and 12 miles depending on location and time. Therefore a usable range of 10 miles is probably to be expected.

The accuracies also varied considerably, depending on the number of racons being received, their geometry, relative to the vessel and the consistency of response. During static tests 'ideal' locations were found at which both racons were almost continuously available, with ranges of less than 10 miles and the geometry was good – the two Lines of Position (LOP) crossing at right angles. Combined position accuracies at these points were 5-10 m. When geometry was poor or only one racon could be received, accuracy was in the region of 50-100 m.

Plots shown in ***Figure 6,** top right,* provided by Furuno indicate typical performance, with single racon accuracy of 40 m within 5 miles, 100 m at 12 miles, but with two racons accuracy of 2 m was achieved. Whilst the availability of the single racon fix at under 5 miles was 98%, the availability of the two-racon fix was dictated by that of the more distant racon at 87%.

Conclusions

New technology radar with an enhanced radar AtoN infrastructure is technically feasible as an option for providing resilient positioning within about 10 miles of the coast. The installations of the radar and racons were not optimal, but accuracy achievable with two LOPs and good geometry was 5-10 m and 50-100 m with a single LOP.



***Above,** Figure 7: The location of the trials in the UK*
***Right,** Figure 8: The trials area.*

BY **Neil Jones**, RECORDS MANAGER, TRINITY HOUSE

The South Goodwin Lightvessel *Disaster of 1954*

"A LIGHT – CLEAR, RUDDY AND BRILLIANT, like a huge carbuncle – uprose one evening from the deep, and remained hovering about forty feet above the surface, scattering its rays far and wide, over the Downs to Ramsgate and Deal, along the coast towards Dover, away beyond the North Foreland, across the Goodwin Sands, and far out upon the bosom of the great North Sea."

This depiction of a lightvessel illuminating the Goodwin Sands – from *The Floating Light of the Goodwin Sands* by R M Ballantyne in 1870 – gives the reader an idea of the position of the aid to navigation marking the narrowest point of the Dover Strait, the busiest shipping lane in the world.

The Great Ship Swallower

Since the first recorded shipwreck in the Goodwin Sands – named for Godwin, Earl of Wessex (1001–1053), father of King Harold II – dating back to 1298, there has been an enormous number of ships, seafarers and passengers stranded on sands which rapidly turn into lethal quicksand, engulfing ships and survivors within days, giving the sands the name the 'great ship swallower'.

The greatest single event causing loss of life occurred during the Great Storm of 1703; the same storm dragged Henry Winstanley's Eddystone tower to the bottom of the sea. The writer Daniel Defoe's account of the storm stated that over 2,000 sailors were lost, *or "set up shop on the Goodwin Sands."*

A lightvessel, the Goodwin, was first positioned at North Sand Head in 1795 (and discontinued in 1898), and another at the Gull in 1809 (discontinued in 1929). A lightvessel was first established at the South Goodwin in 1832, at South Sand Head, and at the East Goodwin in 1874. The South Goodwin Lightvessel was discontinued in July 2006 and replaced with the SW Goodwin Lighted Buoy.

By November 1954 the South Goodwin station was being marked by No. 90 Lightvessel, a steel vessel built in 1937, 118' 9" length overall with no means of propulsion; the only other lightvessel marking the Goodwins at this time being the East Goodwin Lightvessel.

On 26th November 1954, heavy weather set in around the Goodwins, putting an immense strain on the 410 metres of heavy cable mooring the lightvessel. Shortly after midnight, huge waves and Force 12 winds parted the cable.

The basic facts thereafter are reported in the *Trinity House Lightvessel Handbook:*

27th November 1954:

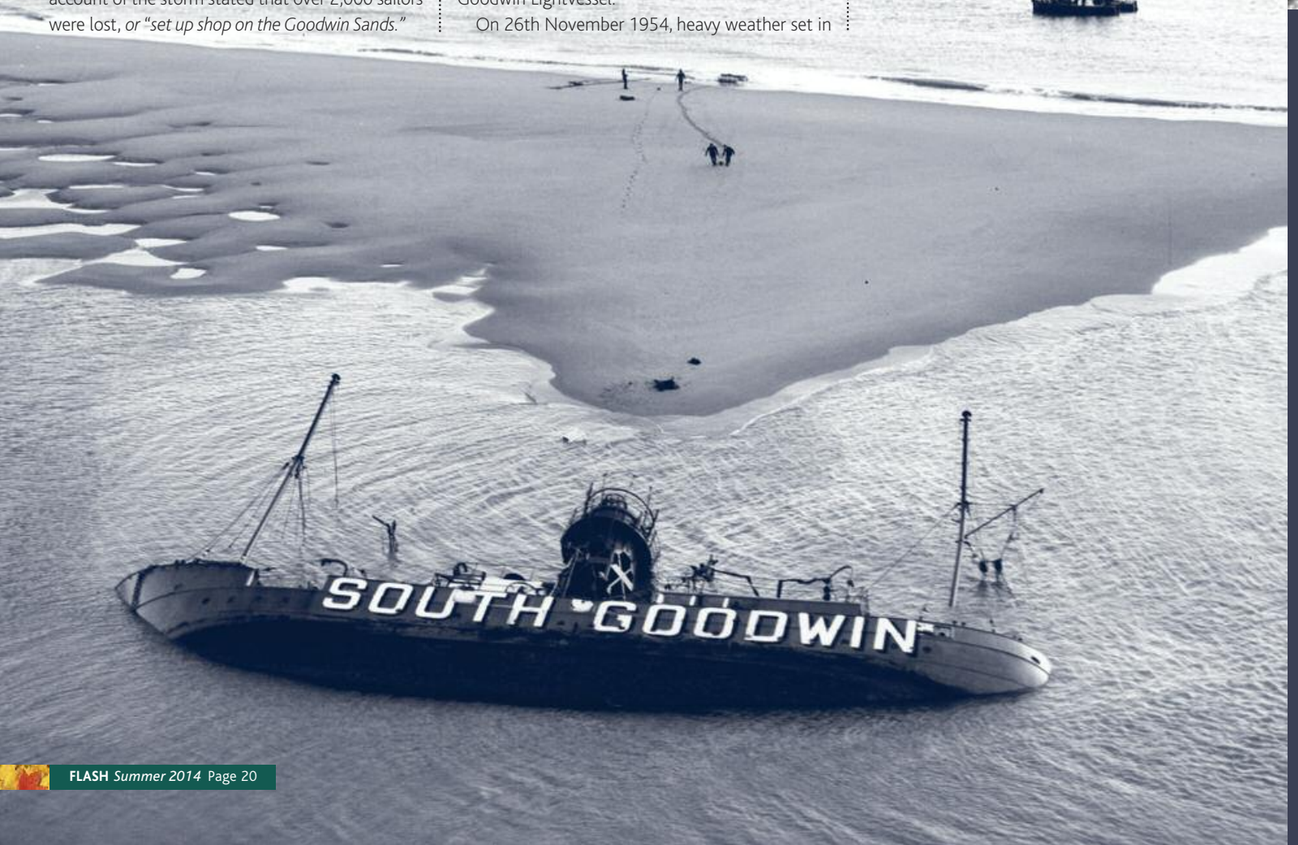
"No. 90 Light Vessel at the South Goodwin Station broke adrift in the early hours of Saturday morning 27th November 1954."

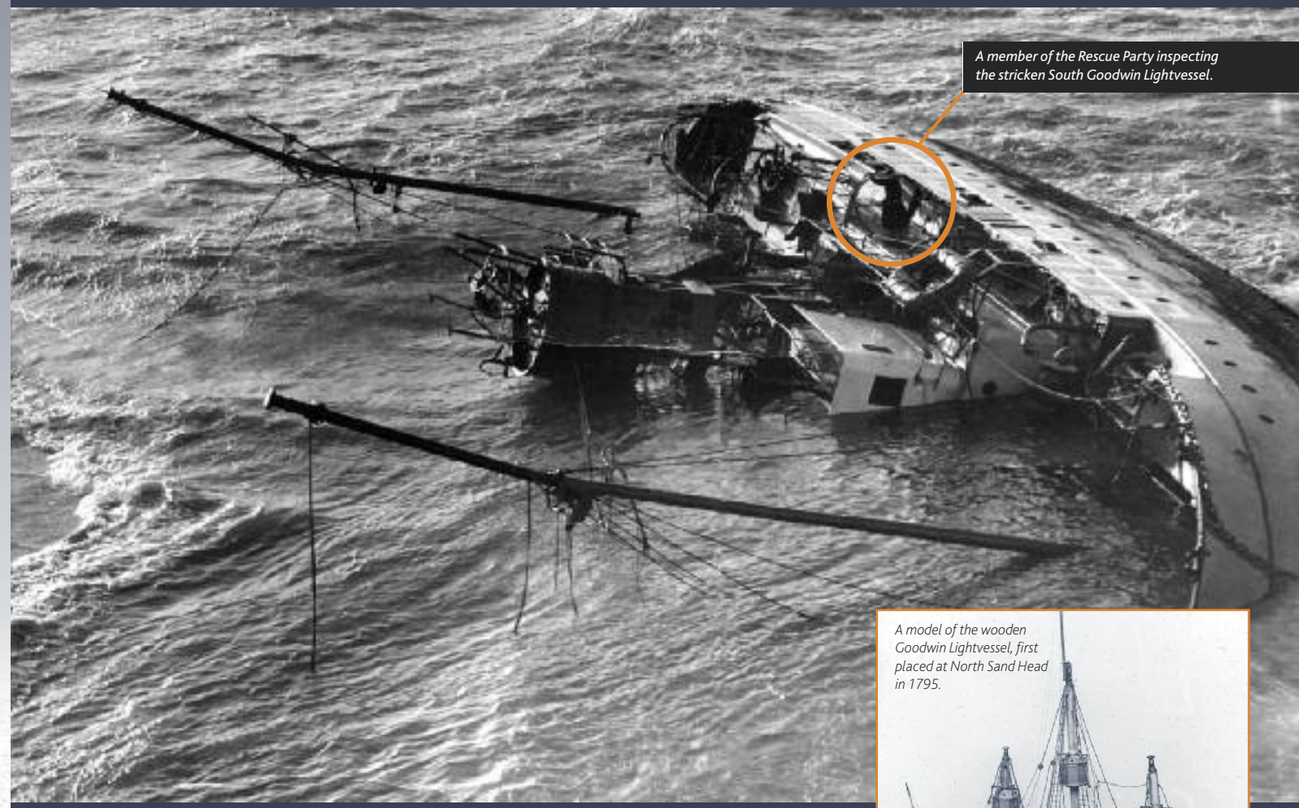
First intimation that the lightvessel was adrift came from Deal Coastguard Station (at 0115 on 27th November).

"The Light Vessel drifted North and was found lying on its starboard side on the Goodwin Sands in approximate position 51° 14' 10" N, 01° 34' 54" E.

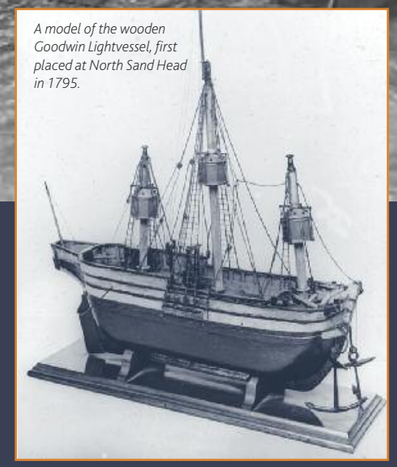
A helicopter from Manston Aerodrome rescued the only man seen on board the Light Vessel (A Ministry of Agriculture Official).

Temporary buoy was laid about 1900 on 27 November whilst No. 65 Light Vessel (the emergency spare) at Harwich was being prepared for the Station."





A member of the Rescue Party inspecting the stricken South Goodwin Lightvessel.



A model of the wooden Goodwin Lightvessel, first placed at North Sand Head in 1795.

29th November 1954:

"No. 65 Light Vessel was laid at the Station."

Remembering The Crew

The above report, while necessarily free from prolix and the horror of the night's events, does little to record the loss of the crew: Thomas Skipp, Master, from Coggeshall, Essex; Kenneth Lanham from Bow, East London; Sidney Philpott from Ramsgate, Kent; Walter Viney from Plaistow, East London; George Cox from Gorlestone, Norfolk; Thomas Porter from Holbrook, Suffolk and Henry Lynn from Dovercourt, Essex.

The loss of the crew was commemorated by Trinity House in a 50th anniversary ceremony on board THV *Patricia* on 26th November 2004; Deputy Master Sir Jeremy de Halpert fleshed out the narrative of the night's catastrophic events, excerpted here:

"Sometime between midnight and 0100 the cable parted but such was the battering no one would have known. ashore, Ramsgate and Deal Coastguard were worried, but visibility was low. Suddenly, at about 0115, the East Goodwin Light Vessel saw its sister ship sweep past six miles north of the station; they could only watch in horror.

"The crew, we know, mustered in the galley and shortly afterwards the ship hit the sands in Kellet Gut, collapsing onto her starboard side. Inside, the men were fighting for survival, the galley door was under water sealing off the exit, but one man, the survivor Ronald Murton (a Ministry of Agriculture and Fisheries official carrying out observations), scrambled through the skylight and into the inferno that was raging above.

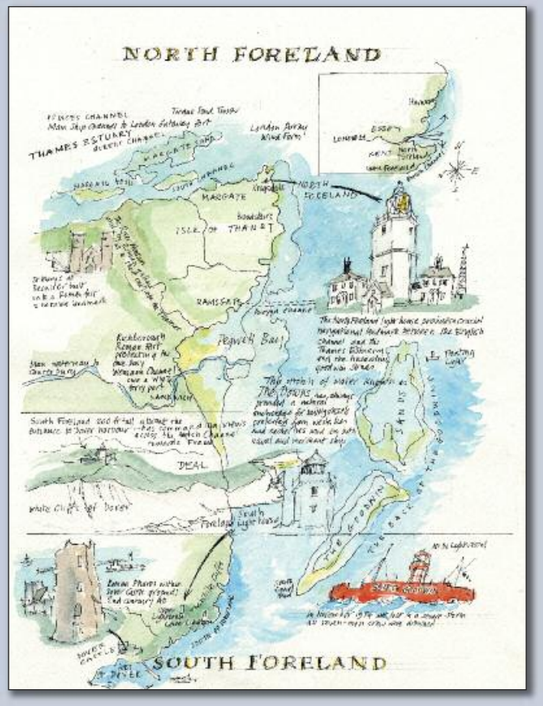
"Meanwhile lifeboats from Dover and Ramsgate and a United States search and rescue helicopter from Manston were launched, but it was not until daylight that the wreck was located, by the helicopter.

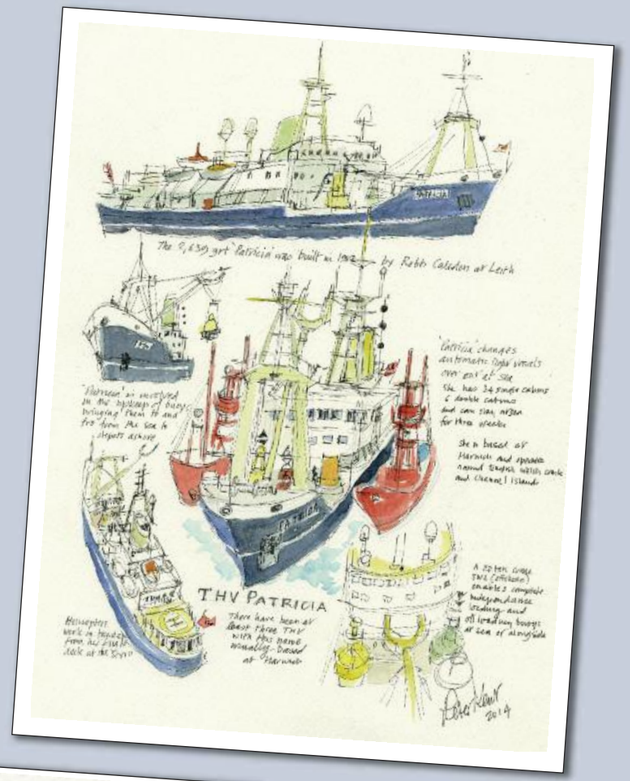
In an amazing feat of accurate flying, for which the crew received bravery awards, the helicopter snatched Murton from the hull. He had survived the worst channel storm in two centuries.

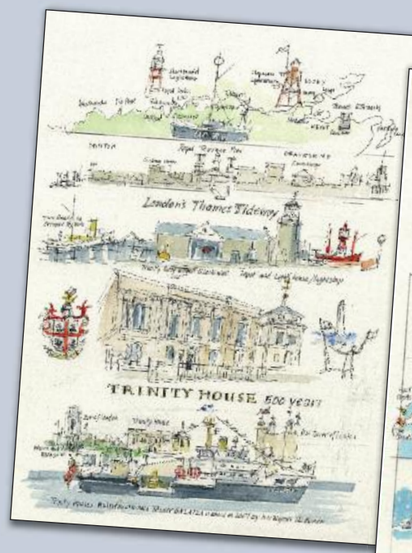
"His first words were for his fellow crewmen whom he knew were still alive in the hull. But even as the rescue operation for them was being launched the race against time and tide was being lost. The lifeboats could not get near to the lightvessel and within hours the tide had enveloped her and those trapped inside her hull. The extreme weather lasted a further day, and on 28 November divers eventually were able to get on board. There was no trace of the crew; not a single body was recovered.

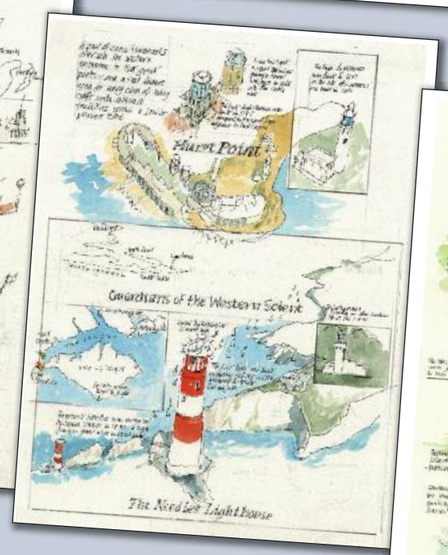
"Today the South Goodwin Light Vessel lies beneath the Goodwin Sands, with her brave crew. It is in times of such disasters, and our remembrance of them, that we focus on the hazards of the seas and the service of those who ensure our safety."

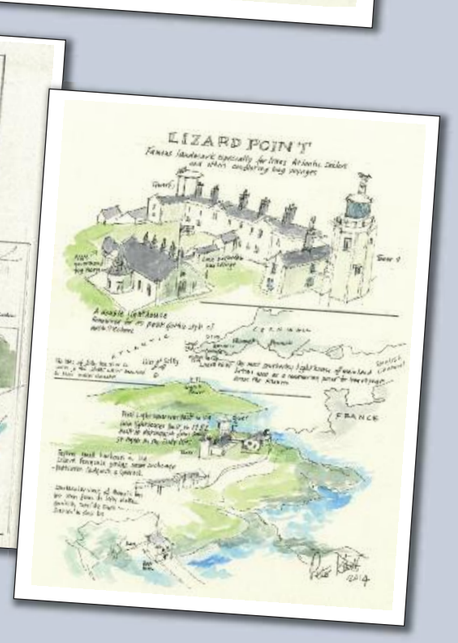
Directly after the events of 27th November 1954, such was the outpouring of grief and sympathy from home and abroad that Trinity House was able to compile a Book of Commiserations within the week. Rear-Admiral Charles Lyman of the US Navy wrote that, *"we do not often find occasion to express our appreciation for such services, but it seems to me that such an occasion has now, unfortunately, arisen."*











Here we introduce the work of Greenwich artist **Peter Kent** who, from his Thameside studio creates the most remarkable drawings with representational views of urban, particularly maritime, scenes. There is no doubt he has a passion for everything connected with the sea and rivers.

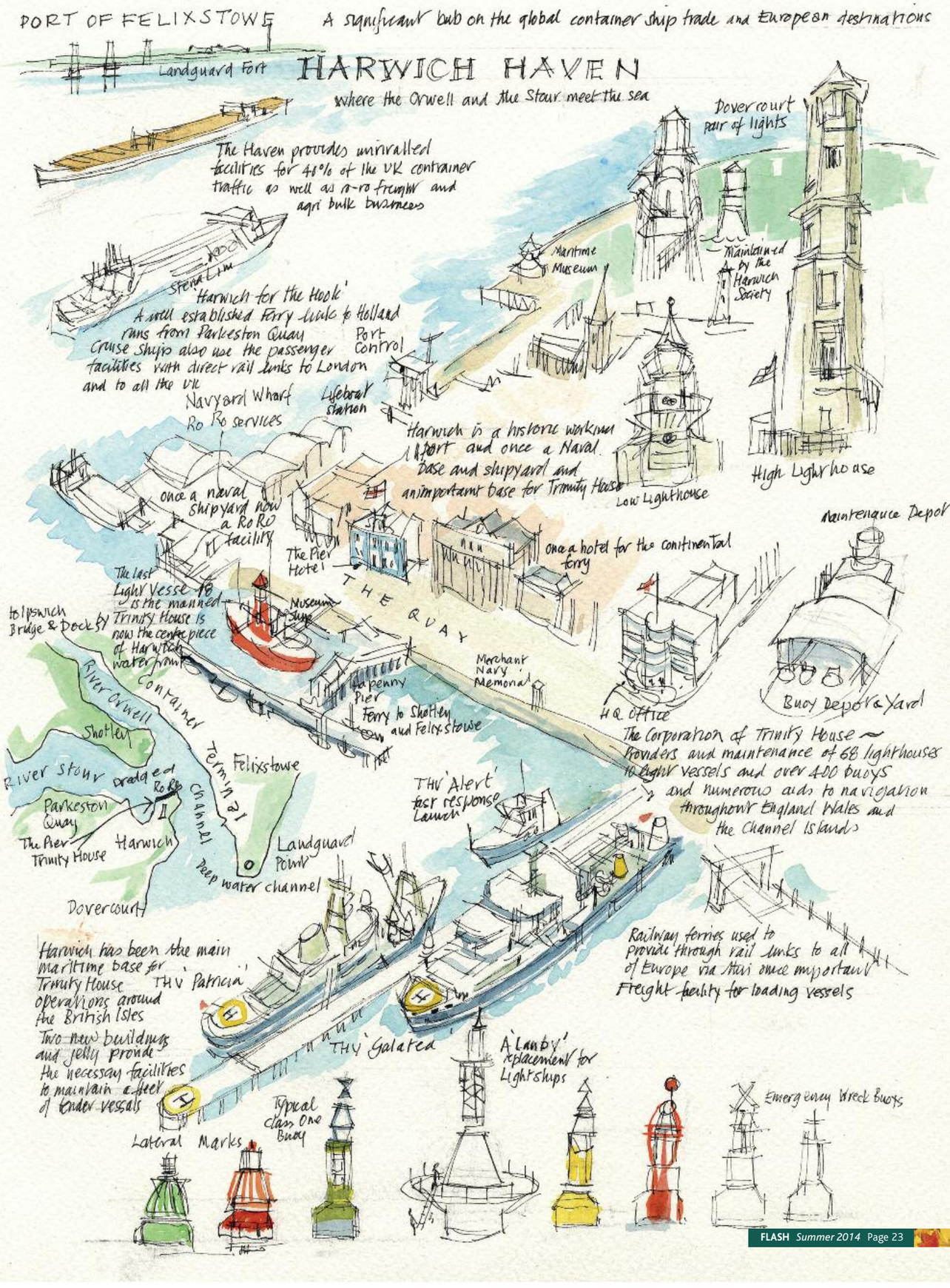
He records accurate views of buildings and townscapes and in addition often provides the bird's eye view frequently with a comment by way of text pointing to an aspect of history or, indeed, to a personal memory.

In recent months he has created an extensive collection of the work of Trinity House recorded both in London and around the coast and you see some examples on these pages.

More examples of his work are available on his website at **www.peterkentgreenwich.co.uk**

Peter Kent's topographical images of Trinity House

Prints of these works are available to order from www.peterkentgreenwich.co.uk and a donation will be made to the Corporation's charities for each item sold. Please quote code **TH/FLASH**.



BY **Thomas Arculus**, BSC MSC LLB (HONS) MRICS ESTATES AND PROPERTY MANAGER

To the Lighthouse

GODREVY LIGHTHOUSE AND ITS PLACE IN THE CANON OF ENGLISH LITERATURE

ON 12TH SEPTEMBER 1892 a small boat set out across St Ives Bay bound for Godrevy Island and its lighthouse. On board were members and friends of a remarkable family including a girl of ten years named Adeline Virginia Stephen and the Pre-Raphaelite artist William Holman Hunt. The party spent time on the island and all signed the visitor's book before departing. Young Adeline Virginia visited again aged twelve with her father and brothers on 17th September 1894. That girl would grow up to be the writer Virginia Woolf and would draw on those briny memories of her childhood holidays in her literature.

Godrevy Lighthouse is the titular lighthouse in Virginia Woolf's novel *To the Lighthouse* [1927], the most autobiographical of her works. Although the lighthouse in the novel is located in the Hebrides and is black and white unlike plain white Godrevey, Woolf was inspired by her jejune memories of Godrevy and her family's holiday home in St. Ives. When planning the novel Woolf wrote in her diary in 1925, "*this is going to be fairly short: to have father's character done complete in it; and mother's; and St. Ives; and childhood.*"

The book deals with many of her most personal thoughts and anxieties. Many of the characters are based on members of her family and their circle. One such character is Lily Briscoe, a timid, self-conscious and anxious young artist, in whom Woolf is thought to be depicting a combination of her own character traits and those of her sister, the artist Vanessa Bell.

Another character, Mr Ramsay, is modelled on Woolf's father Sir Leslie Stephen, who in real life had a distinguished literary career as a founder and editor of the *Dictionary of National Biography* but was also a daring mountaineer and pioneering alpinist. In the novel Mr Ramsey too has a complicated personality, he is a sententious martinet yet at the same time he is wracked with insecurity and self-pity.

Woolf's mother, Julia Duckworth (*née* Jackson), is the novel's Mrs Ramsay, enchanting hostess, sympathetic wife, and mother of eight. Julia Jackson was a noted beauty in her youth and muse of the Pre-Raphaelites including her former suitor William Holman Hunt. In the novel the intellectual Charles Tansley is such a character – a hopeless admirer of Mrs Ramsay – who hangs around to the annoyance and at times amusement of Mr Ramsay. Holman Hunt had another connection with Trinity House. In the 1850s he had worked at Trinity House, Tower Hill restoring the painted ceiling in the Court Room and as an impecunious young artist had been glad of the work.

Like the family in the novel, the Stephen family had eight children from their parents' marriage to each other and their parents' previous marriages.

The holiday house described in the novel is Talland House, above Porthminster Beach. Talland House had lawns stretching down to the sea in those days and the light from the lighthouse across the bay would penetrate the rooms at night just as described in the novel. Leslie Stephen rented Talland House every summer from 1882 to 1894, a period which saw the birth and early childhood of his daughter Virginia.

At the novel's beginning the Ramsays' young son, James, is promised a trip to the lighthouse, an adventure which he longs to go on but which, for various reasons, doesn't happen until years later. The novel then proceeds briskly with minimal detail over a period of several years during which the Great War begins and ends and some of the characters die, including Mrs Ramsay. In reality Woolf's mother also died young.

Eventually, years later, the novel returns to the summer holiday house by the sea and the long delayed trip to the lighthouse actually happens with Mr Ramsay, James and his sister Cam as passengers in a local fisherman's boat.

The journey across to the lighthouse is a masterful study of the solipsism and innermost thoughts of the crew and passengers of a small boat on the bounding ocean before a fresh breeze.

Woolf's stream of consciousness technique is used to full effect. Whilst the boat skips along with James at the tiller Mr Ramsay unexpectedly praises his son, praise James has longed for and never had before, and despite James' implacable hostility to his father they come closer to understanding something about each other. Cam, too, comes to respect her father, seeing for the first time another more clement, loving and wise side to him.

"James looked at the lighthouse. He could see the whitewashed rocks; the tower, stark and straight; he could see that it was barred with black and white; he could see windows in it; he could even see washing spread on the rocks to dry. So that was the lighthouse, was it?"

Finally, the boat lands at the lighthouse as Lily Briscoe watches from the shore, with a sudden flash of inspiration and final bold brushstroke, she finishes a painting she began at the start of the novel. *"I have had my vision."*

Godrevy lighthouse was built following several notorious wrecks on the nearby Stones Reef culminating in the wreck of the steamer *Nile* in 1854 with the loss of its cargo and nearly forty souls. After some debate between Trinity House, the Board of Trade and the War Department, Godrevy island was chosen as the site to build the lighthouse rather than building a new rock tower on the Stones at vast expense or on the mainland.

The lighthouse was designed by James Walker and built by Thomas Eva and Thomas Williams of Helston. Construction commenced in January 1858 with the hardy workmen living in tents on the island.

The light was first exhibited on 1st March 1859 but tragically on the night of 25th November 1859 two unknown vessels came to grief close by with the loss of all hands having apparently mistaken Godrevy for the Longships light.

The tower is built of rubble stone and mortar and has walls nearly four feet thick at the base. It is 86 feet high to the top of the weathervane. The total project cost £7,082/15s/7d.

At the time of the Stephen family's visits it was manned by three keepers who rotated with two on station at a time whilst the other took his furlough.

The lighthouse was automated in 1934 and a red sector was added to mark the Stones. At the same time the rotating beam was replaced with a fixed flash and the fog bell was discontinued. The station ran on acetylene gas at that time. It was converted to solar power in 1995. The lighthouse, oil store and boundary walls are now Grade II listed buildings.

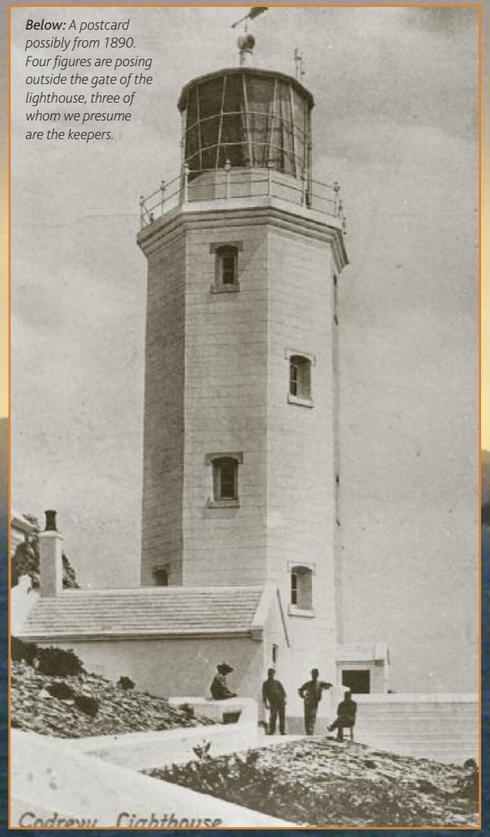
Godrevy Lighthouse was re-engineered in 2012 when the main light in the old tower was replaced with solar powered LED beacons mounted on a new steel lattice tower erected a few feet to the north. The character of the main and sector lights is now Fl WR 10s and range 8NM. The sector light marking the Stones has character W022-101 (79°) R101-145 (44°) W145-272 (127°) and the new aid to navigation is operational at night only. The Stones is also a buoy station.

The visitors' book, covering the years 1859 to 1934, in which young Adeline Virginia Stephen had written, was sold at auction in November 2011 for £10,250, more than the original cost of building the lighthouse!

PHOTOGRAPH: © 2014, Chris Wroe.

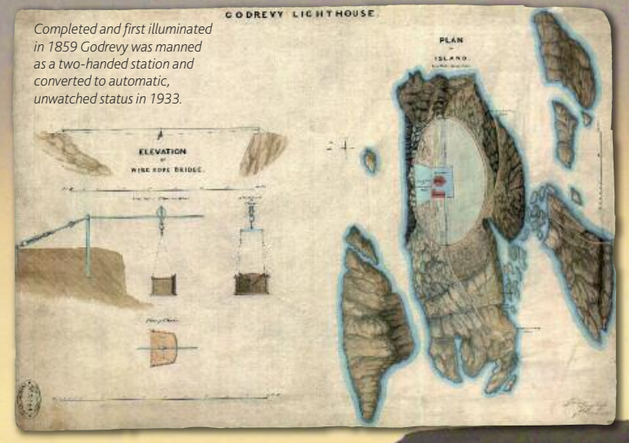
Editor's note:
An exhibition entitled VIRGINIA WOOLF: ART, LIFE AND VISION will be at the National Portrait Gallery, London, from 10th July until 26th October 2014. See also ***www.npg.org.uk***

Main picture: Godrevy at sunrise across St. Ives Bay.
PHOTOGRAPH: T.L. Arculus ©2014



Below: *A postcard possibly from 1890. Four figures are posing outside the gate of the lighthouse, three of whom we presume are the keepers.*

IMAGE: © 2014, TRINITY HOUSE ARCHIVE.



Completed and first illuminated in 1859 Godrevy was manned as a two-handed station and converted to automatic, unwatched status in 1933.

PHOTOGRAPH © 2014, Ron Blakeley.

BY **Adrian Wilkins**, C ENG, FIMECHE, FRIN

The first Trinity House **Lighted Buoys**

THE 19TH CENTURY SAW THE DEVELOPMENT OF IRON STEAM SHIPS and a rapid increase in maritime trade. There was however no means of identifying buoyed channels and buoyed dangers at night to enable ships to safely enter or leave harbours and anchorages after dark. When manoeuvring in areas of restricted water depth the only navigation aid was the leadline.

Above: *Pintsch Gas buoy, c. 1882.*

Oil burning lamps were the main light source for lighthouses and lightvessels and sophisticated oil burning lanterns were developed for use on buoys by Lyth in Sweden, Bourdellsche in France and Wigham in the Ireland. These attempted, by various mechanical means to overcome the problems of maintaining a bright flame burning on a wick while the buoy moved around at sea in strong wind conditions. While drawings survive of these lanterns I have not found any reports on their use on buoys, except in harbours and later versions found use on lighted beacons where they were accessible for regular, probably weekly maintenance.

Trinity House was one of the first lighthouse authorities to trial the German Pintsch gas buoys that in 1877 lighted a buoyed channel in Russian waters. The Pintsch gas was referred to as "oil gas." This had the advantage of being a fuel that could be compressed and stored in the body of the buoy. The gas burner in the lantern, once correctly adjusted, required no maintenance.

The edition of *The Engineer* for 25th April 1879 reported on these trials which seem to have been undertaken the previous year. Buoys were trialled on the Thames, one close to the Trinity House Blackwall depot and another near to the exposed Mouse lightvessel station in the Thames estuary. The Blackwall buoy was of 1.7m³ gas capacity, contained at a pressure of 6.2 bar. This was found to operate a continuously burning light for 27 days and, as noted in the report, the light could not be extinguished *"by forcing water at it."*

Main image: *AHW Gas lantern on Ovens Buoy in the Thames.*

The *"oil gas"* was distilled at high temperatures from crude oil or oil bearing shale and then compressed into steel gas holders. This process had been developed by the Pintsch Engineering Company to provide gas for their railway carriage lighting systems. The gas was burned in an open flame burner and would have provided a bright but yellow flame. The first Pintsch buoys utilised spherical steel buoy bodies developed from mine bodies they had manufactured in the Franco-Prussian War. They incorporated these into a high focal plane tail tube buoy. The early buoy bodies were constructed from steel plate with hammer welded seams. Later buoys used the then more conventional riveted construction.

The lantern had a Fresnel lens and a sophisticated ventilation system that would prevent soot and condensation forming on the lens. It provided the basis for the design of subsequent oil gas and acetylene lanterns. *The Engineer* report noted that the first trial buoys had *"an ordinary square framed lamp,"* but unfortunately provides no more details.

The lantern contained a regulator that reduced the pressure of the gas stored in the buoy body to a constant low pressure and fed this gas directly to the burner. This regulator utilised a spring to control the gas pressure; the previous regulators used for railway carriage lighting had used dead-weight pressure control systems. A valve was incorporated on the deck of the buoy to allow the buoy to be re-fuelled with gas from a gas holder on a tender or a gas storage system at the depot.

The trial report also notes that Pintsch had developed an electrical system to extinguish the light at sunrise and re-light it at sunset. Trinity House seems to have chosen to avoid this added complexity.

These Pintsch buoys were soon in service with Trinity House and other authorities around the world. They were initially supported by the network of gas distillation plants that Pintsch had established for their railway lighting equipment. Trinity House installed a gas distillation plant at Blackwall to produce oil gas under license from Pintsch and similar installations were made by lighthouse authorities in France, Germany, Holland and the United States. The 1905 Lighthouse Congress in Milan reported 1317 lighted buoys in use worldwide.

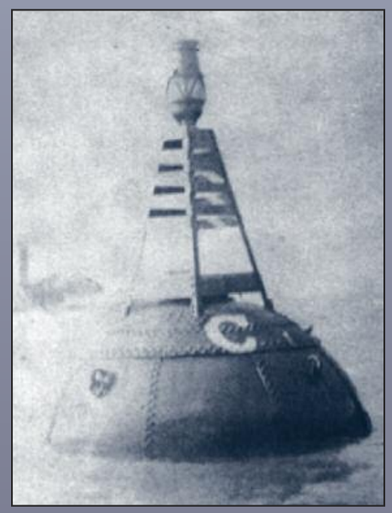
The original buoys had a continuously burning light that could operate for around thirty days. The service period depended on the volume of gas that could be stored in the buoy body. A clockwork occulting mechanism was introduced in 1881, reducing gas consumption and increasing the service life to three months. Further development resulted in a flasher mechanism powered by the gas flowing to the burner, patented in 1883.

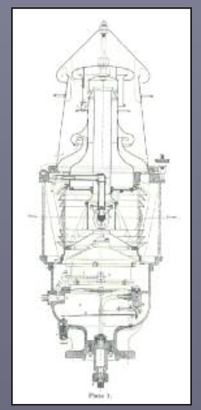
These new lanterns were very successful and conversion kits were marketed to modify the original open flame lanterns to mantle lanterns.

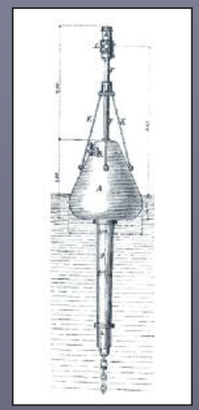
As these gas lanterns were developed, Pintsch worked with Auer von Welsbach, the inventor of the incandescent mantle, to develop a small rigid mantle that transformed the yellow oil gas light into a much brighter white light increasing the lantern's intensity by a factor of around ten. By the 1890s a competing gas lighting system had arrived. Acetylene was discovered in 1892. This could be easily manufactured by reacting calcium carbide with water and had the unusual advantage of burning with a bright white flame in an open flame burner. However acetylene is extremely explosive. Initial trials, mainly in Canada, with oil gas buoys converted for use with acetylene compressed into the buoy body, resulted in several serious accidents with considerable damage and loss of life. A buoy was also produced that had an on-board acetylene generator, however these proved equally hazardous to operate.

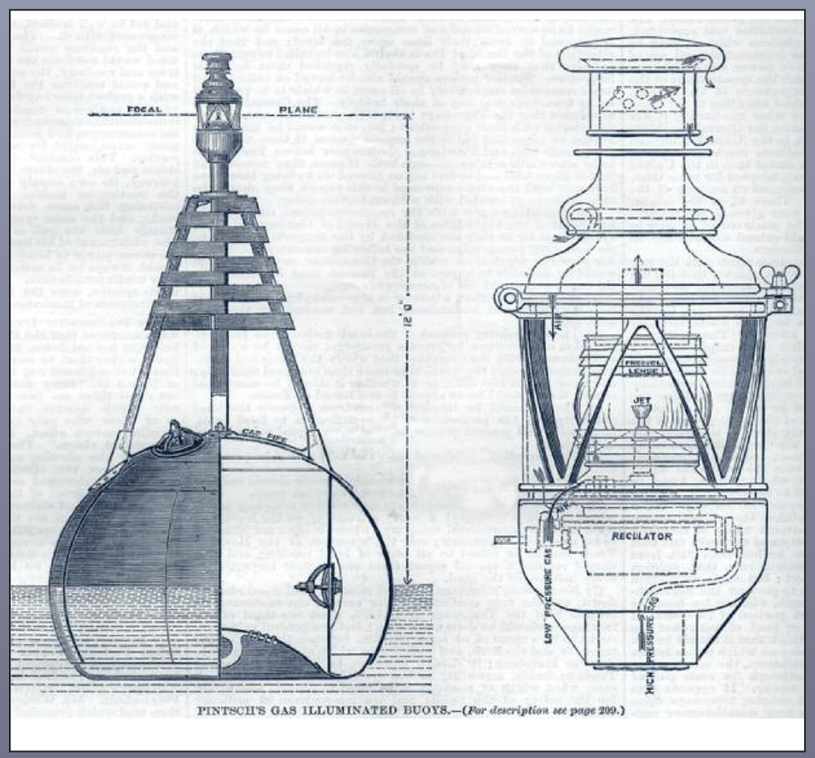
The safe storage of acetylene in cylinders and the development of lighting equipment for use with acetylene were primarily the work of the Swedish engineer Gustav Dalén and the AGA Company. Acetylene buoy lighting then competed with oil gas, later LPG, for most of the 20th century.

There is still a legacy of the oil gas system in the Trinity House service in the few remaining ROG buoy bodies. These are a class of small skirt type oil gas buoys that were converted to house acetylene cylinders and were referred to as Redundant Oil Gas buoys.









PINTSCH'S GAS ILLUMINATED BUOYS.—(*For description see page 209.*)

Top left: *Early Pintsch buoy.*
Top right: *Pintsch Gas lantern.*
Lower Left: *Pintsch OilGas lantern.*
Lower right: *Pintsch Buoy from c.1885.*

Editor's note: The author has now written *A History of Floating Aids to Navigation*, published by IALA at €18. To buy a copy email IALA at: contact@iala-aism.org

BY **James Gray**, BSc (HONS), MBA, FRICS, MAPM. PARTNER – HEAD OF PROJECT AND BUILDING CONSULTANCY, CLUTTONS LLP

Trinity House: *Keeping the building running*

THE HEADQUARTERS OF THE CORPORATION OF TRINITY HOUSE ON TOWER HILL was originally built between 1794 to 1796 by Samuel Wyatt, Surveyor to the Corporation. During the Second World War it was gutted by a German incendiary bomb lodged in the roof of the stairwell, leaving nothing of the original building save the Trinity Square façade. After the war Professor Albert E Richardson undertook the reconstruction of the house using a number of photographs of the rooms taken by *Country Life* magazine in 1919 to reconstitute almost exactly the interior of its original form. In place of offices which stood to the east of Wyatt's building, a new wing was added by Professor Richardson containing the Library, Reading Room, Pepys Room and the corporate offices. The restoration was completed in 1953. Trinity House was again refurbished in 1990 with a large element of the work concentrating on introducing modern building services into the House.

Above: *Possibly the architect Samuel Wyatt's impression of Trinity House, published in European Magazine on 1st July 1795.*

Above: *Replacement of the chiller unit which services the air-conditioning to the House being craned in with Trinity Square closed.*

The object was: ***"To stave off decay by daily care."***

A Grade 1 Listed building

Trinity House is a Grade I Listed building not only for being historically significant and retaining its original late 18th century elevation but also for the very fine restoration and addition to the building by Professor Richardson after the war.

We were instructed in 1996 by the Corporation of Trinity House to prepare a 20-year planned preventative maintenance programme for the House with the aim of keeping it in a good state of repair and redecoration. In other words, to follow the conservation philosophy first articulated by John Ruskin and William Morris that inspired the Arts and Crafts Movement in the second half of the nineteenth century, the object was: "*To stave off decay by daily care.*"

The need to record condition of Trinity House

As a young surveyor in 1996 I set about recording the condition of Trinity House both externally and internally, including decorations, furnishing, mechanical and electrical services and associated equipment that assisted in the running of Trinity House. The purpose was in essence about removing surprises and maximising efficiency. It was a planned approach where works are considered, forecast, scheduled, prioritised co-ordinated and budgeted for in advance. The aim was to reduce unnecessary expenditure and protect the property as an investment for it is an historically significant building.

Since publication of the 20-year maintenance programme in 1997 we have year-on-year implemented the programme. It has involved the cyclical redecoration and restoration of the external elevations, the redecoration and refurnishing of the interiors and the phased replacement of mechanical and electrical plant throughout the building. The challenge in undertaking these works is not only in ensuring the sensitive repair and quality of work commensurate with the historic significance of the building, but also to undertaking the works in a fully operational building. Trinity House is not only used as the headquarters for the Corporation but its ceremonial rooms are hired out for functions, meetings, wedding ceremonies and so forth throughout the year. Therefore finding an appropriate period to carry out the planned maintenance works is a challenge within itself. Traditionally August is a month when Trinity House is closed for external hire and this is the period when the planned works often have to be carried out and condensed within.

Above right: *The unit is located in the roof top plant room which can only be accessed by removal of a section of the roof and via a small aperture in the structure.*

Lower left: *Planning when and where works are to be carried out and how they are co-ordinated frequently demands adequate protection of decoration and features in the House.*

Top left & lower right: *Replacement of the chiller unit which services the air-conditioning to the House. All had to be craned in over one weekend in August with Trinity Square closed.*

A 20-year maintenance programme

Planned maintenance will inevitably be adjusted, for example by the need for changes in use or in legislation. In 2005 the major refurbishment and alterations to the ground floor accommodation was undertaken to improve the reception areas and provide enhanced facilities for visitors. In 2008 the second floor offices and accommodation were altered to create modern efficient open plan space. As a result of such changes we continually review the planned maintenance programme and it has since been updated and extended for a further period until 2027.

A particular challenge last year was the replacement of the chiller unit which services the air-conditioning to the House. The unit is located in the roof top plant room which can only be replaced by removing a section of the roof and replacing the unit via a small aperture in the structure. The challenge was to design a unit to not only to meet the requirements of the air-conditioning system but also fit within the restrictive space of the plant room and be delivered and fitted within the month of August. In addition to this, Planning and Listed Building Consent was required as well as having only one week-end in August available to close Trinity Square to crane in the new equipment. With careful planning and co-ordination the installation was achieved with only inches to spare. This illustrates a part of Trinity House that is never seen but is critical to the building's functioning

Minimal inpact on HQ operations

Keeping the building running is about planning in advance. This involves planning the works themselves, obtaining the necessary statutory consents, planning when they are to be carried out and how they are co-ordinated in the most efficient way with minimal impact on the building's operation.

Reverting to the ideas articulated by John Ruskin and William Morris we are merely the custodians of historic buildings for future generations.

Charities

We provide here a small representative selection of organisations taken from a broad range of charities and other beneficiaries in receipt of grants from the Corporation in recent months.

Mariners' Park

This is the name given to a unique haven where retired needy seafarers and their dependants can live alongside those who have also experienced a life at sea.

Centred on a 16 acre estate in Wallasey on the Wirral peninsula there are immaculately-kept grounds with views of the River Mersey and the iconic Liverpool waterfront.

This estate contains 95 homes, mostly one- or two-bedroomed houses, apartments and bungalows. Grounds include a bowling green and walking routes to nearby New Brighton or Seacombe, where it is possible to catch the ferry to Liverpool. Many benches have been provided for those who simply wish to tarry a while and enjoy the scenery.

Nearby, there is a wide range of local amenities including shops, a post office and doctors' surgeries. For those residents who wish to live independently or perhaps cannot get out and about enough to visit the shops, the Home Care service can arrange for shopping to be collected and delivered.

Mariners' Park is a place with a long and proud history, and is constantly evolving to include all the latest modern facilities, helping its residents enjoy a long, safe and happy retirement.

The latest addition to the accommodation options was opened by HRH The Master on 4th April. Known as the Trinity House Hub this project costing more than £4million provides community facilities and 18 one- and two-bedroom apartments to rent. Care support is available 24 hours a day, seven days a week, to ensure that residents with extra care needs are provided for. In addition individual Care Plans can be tailored to the needs of each resident.

The Hub's community facilities now enhance those already available to residents. For example there is a community room and a hobbies room to enable the Nautilus Welfare Fund to organise more events and host meetings.

The site offers a café serving food and drink for residents and their guests, a spa, a gym and hairdressers.

The estate also has a Care Home to provide both residential and nursing care, including short stay respite care. In addition guest accommodation to allow family and friends to visit for stays of up to two weeks' duration is available.The Nautilus Welfare Fund has acknowledged the many donations which have made this new project possible.

Left: *HRH The Master arrives at Mariners' Park (see above) on 4th April to be greeted by the Deputy Master and, from the left, Peter McEwen, Special Policy Advisor; Mike Jess, Assistant General Secretary; Bob Thornton, Chair, Nautilus Welfare Fund Committee; Wilco van Hoboken, Vice Chair, Nautilus International Council.*

Main picture below: *Ramsgate Lifeboat Station with the all-weather Trent Class lifeboat* Esme Anderson *alongside.*

Trinity House funded the shore works here to accommodate a new Atlantic 85 inshore lifeboat which is due to arrive at the station later this year to replace the Atlantic 75 inshore lifeboat which has served at Ramsgate since 2000.

Ramsgate Lifeboat station

This station was established in 1802, the first lifeboat being built by Greathead for the Trustees of Ramsgate Harbour. The station lapsed for some time before 1824 until 1851, when the Harbour Trustees purchased a lifeboat built by Beeching of Great Yarmouth. The RNLI controlled the station jointly with the Board of Trade from 1865 until 1922, when it took over full responsibility. The current lifeboat station, opened in 1998, lies on the harbour wall between the inner and outer pools of the main harbour and services both the inshore lifeboat, *Bob Turnbull* and all-weather lifeboat, the RNLB *Esme Anderson.*

Trinity House funded the shore works here to accommodate a new Atlantic 85 inshore lifeboat which is due to arrive at the station later this year to replace the Atlantic 75 inshore lifeboat which has served at Ramsgate since 2000. The new craft will work alongside the station's all-weather Trent class lifeboat *Esme Anderson.*

Whilst the all-weather boat lies afloat on a pontoon alongside the lifeboat station, the inshore boat is housed in a boathouse within the station from which it is pushed out on rails onto a deck and lifted into the water by means of a davit. The Atlantic 85 is slightly larger as it seats four crew members, rather than three, and has enhanced features such as radar and direction-finding equipment. It is this extra size that has necessitated larger accommodation.

Sailors' Children's Society

This charity was formed in 1821 to provide assistance to disadvantaged children of seafarers throughout the United Kingdom. The help the charity provides includes the arrangement of clothing and school uniform grants and welfare grants for day to day childhood necessities. In addition caravan holidays can be provided as well as home computers for educational purposes. Furthermore, emotional and practical support via Family Support Officers is arranged.

To date the Society has helped over 8500 children and its aim is to let each of these children achieve their full potential and not be held back by traumatic family circumstances such as bereavement, terminal illness or desertion of a parent.

The Society makes a moral commitment to each of the families on its Support Scheme to provide assistance until they are either once again able to move forward independently or until the youngest child in the family leaves education.

Top: *The all-weather Trent Class lifeboat,* Esme Anderson.

Above: *The RNLI's Atlantic 75 three-seat inshore lifeboat Bob Turnbull due to be replaced at Ramsgate by a four-seat Atlantic 85 Class craft (**left**).*

Below: *Annie Garton (pictured right) who represented the UK at the European Judo Championships in Barcelona in 2012. She received funding from the Sailors' Children's Society and additional grants enabled her to follow her dream. Since 1821 the Sailor's Children's Society has given each disadvantaged child of a seafarer the opportunity to achieve his or her full potential by providing financial, practical and emotional support.*

BY **Annika Johansson**, COMMUNICATIONS OFFICER, SMA

Swedish Maritime Administration

SWEDEN IS ONE OF THE WORLD'S MOST SHIPPING-DEPENDENT COUNTRIES, not least because of the long coastline which stretches about 2,400 kilometres and has close to 50 ports. The nation requires efficient transports to maintain the competitiveness of the country's industries. Around 90% of Sweden's exports and imports are transported by sea in some part of the transport chain.

The Swedish Maritime Administration (SMA) is active all around the coastline of Sweden, providing shipping routes and maritime infrastructure from the Swedish-Norwegian border on the west coast to the Swedish-Finnish border in the Gulf of Bothnia. Our services include, for example, pilotage, fairway service, maritime traffic information, icebreaking, hydrography and maritime and aeronautical search and rescue.

SMA is a government agency and enterprise with the task of providing resources for high safety at sea and good accessibility. Since activities are financed primarily by dues and tariffs on merchant shipping, it is referred to as a public service company.

SMA's main customer is the maritime transport sector, followed by ports and local authorities, but other customer relationships are becoming increasingly important, for example freight owners. A large part of the revenues are generated by fees charged to the merchant shipping sector for fairways and pilotage.

"By offering expertise, sensitivity to the issues at hand and excellent service, we want to make a difference to our customers – and to Sweden as a whole," said Ann-Catrine Zetterdahl, Director General of the Swedish Maritime Administration. She continued,

Above: *Ann-Catrine Zetterdahl, Director General, Swedish Maritime Administration.* *Photo: Ida Ling Flanagan.*

"Our point of departure is a sustainable perspective on humankind, the environment and business."

Above: *One of seven new search and rescue helicopters to be delivered in 2013-2014.* *Photo: AgustaWestland.*

Main picture: Oden *is the largest of the five Swedish icebreakers.* *Photo: Tobias Fälth.*

Fairways – Important Blue Motorways

One of the primary tasks of the Swedish Maritime Administration is to maintain and establish safe and environment-friendly fairways. The work includes hydrographic surveying, operation and upkeep of fairways (including lighthouses, buoys and spar buoys) and icebreaking.

The Swedish Maritime Administration owns just over 1,000 lighthouses and lighted beacons. 50% of these are operated by renewable energy sources such as sun and wind. SMA carries out most of the fairway work under its own management, working from its own ships and boats.

The services rendered in the fairways are continuously adjusted to meet the change in flow of traffic, nautical needs and technical development. Maintenance work is performed by SMA's own personnel, using buoy tenders and pilot boats.

Every year after the break-up of the ice the Swedish Maritime Administration performs an inspection of the fairway system. This means that more than 6,000 floating aids to navigation in the fairways are inspected so that they are in good condition after the winter. Damaged and lost material is replaced and the position of the aids to navigation are checked and verified.

The Swedish Maritime Administration is also responsible for the maintenance and operation of reference stations for GPS, called DGPS (Differential Global Positioning System), which significantly increases the accuracy and safety of positioning with GPS. DGPS is also a prerequisite for the use of ECDIS (electronic chart system).

Furthermore, the Swedish Maritime Administration has two hydrographic vessels, *Jacob Hägg* and *Nils Strömcrona*. The two vessels measure the depths in Swedish fairways and establish the position of objects that are relevant to navigation. In addition to the survey vessels, the Administration has two smaller boats for minor survey operations and control of reported errors in the charts.

Hydrographic data, which is obtained through hydrographic surveying, is stored in databases which are used in the production of printed paper charts and electronic charts. The hydrographic information is also used for analytical applications in geographic information systems.

During winter, large sections of Swedish navigational waters become ice-bound, but by means of effective icebreakers all major ports can be kept open throughout the year. It is crucial for the country's economy that the transport system functions 24 hours a day, 12 months a year.

The Swedish Maritime Administration has five icebreakers: *Ale, Atle, Frej, Oden* and *Ymer*. The buoy tenders *Baltica* and *Scandica* are also fitted to assist in icebreaking operations. Icebreaking operations have for many years been performed in close co-operation with Finland's icebreaking service. During a normal winter, the icebreakers operate from the end of December to early May, mainly north of Stockholm.

For obvious reasons, the Swedish icebreakers are out of work for a large part of the year. During this time, they are ideally suited for research projects. The most advanced research platform is the internationally renowned icebreaker *Oden,* which has been designed for international scientific expeditions to the harsh Polar Regions. Icebreakers *Atle* and *Frej* are also equipped for special assignments beyond their regular duties.

Increased safety for maritime traffic

Whenever a ship approaches Swedish waters, SMA's VTS operators survey maritime traffic in certain areas: in difficult passages and where the traffic is dense. Vessels are obliged to report their destination, cargo and depth – information that is shared with several authorities and also make port logistics more easy – the crew on board receive information about weather, wind, current traffic and other matters of importance for their intended route.

There are three VTS centres along the Swedish coast and there are nine VTS areas. The latest addition to maritime traffic information is Sweden's and Denmark's joint VTS, Sound VTS, which is covering the Sound region. Sound VTS is located in Malmö.

Since 2012, the SMA has broadened its partnership with the Port of Gothenburg. The aim of this new collaboration, Gothenburg Approach, is to make the vessel arrivals quicker, easier and more environmentally friendly. Through Gothenburg Approach, vessels get information about the traffic situation in the harbour, and can adjust their speed in time. The port of Gothenburg is the largest port in Scandinavia with approximately 11,000 vessels arriving each year.

AIS (Automatic Identification System) is the name of a system that makes it possible to identify a vessel and to monitor ships' movements, both ship-to-shore and ship-to-ship. The system was developed and implemented to provide more information about the ships in the vicinity than can be obtained via radar. The Swedish Maritime Administration has a network of land based AIS base stations to receive AIS information from vessels but also for the broadcasting of safety-related information.

AIS information can be presented in different ways. The minimum requirement on board is a text display where information about the nearest vessels is presented with ID, distance and bearing. To take full advantage of the information, a graphic display is used, where AIS data is displayed either integrated with radar or electronic chart display, preferably ECDIS.

The Swedish Maritime Administration employs approximately 200 pilots around the country to assist vessels in sections of fairways that require the use of a pilot.

Vessel size and type of cargo determine whether or not a pilot must be used. On average, 35,000 pilotages are conducted each year. The Swedish Maritime Administration has a large number of pilot boats to take the pilots out to the agreed meeting point in the fairway where the pilot climbs up the ship's ladder and boards the vessel.

In Sweden, the Swedish Maritime Administration is the responsible authority for maritime and aeronautical search and rescue operations along the Swedish coastline and in the major lakes, as well as the search for missing aeroplanes throughout the country.

Missions are co-ordinated by our SAR mission co-ordinators at the JRCC in Gothenburg and are carried out in co-operation with the Swedish Sea Rescue Society, the police, Coast Guard and the SMA's own rescue helicopters and boats. The rescue helicopters are a unique asset which is used for the

➥ *Continued on page 34.*

Swedish Maritime Administration *(continued from page 33)*

Above: *Noomi Eriksson, Deputy Director General and Head of Maritime and Aeronautical Search and Rescue Department at Swedish Maritime Administration.* *Photo: Ida Ling Flanagan.*

Below: *Swedish icebreaker* Atle *was built in 1974.*
Photo: Tobias Fälth.

benefit of society as a whole. The helicopters are operated by SMA's own pilots, are available around the clock and depart from five bases around the country.

At the moment there is an on-going process to replace the current S-76 system with seven new search and rescue helicopters from the Anglo-Italian helicopter manufacturer AgustaWestland S.p.A. The first three have to this date been delivered and all deliveries are to be completed in 2014. Featuring long-range and all-weather operational capabilities, helicopters are equipped with a full ice protection system to enable operations in all weather.

"It is very satisfying that we will have an improved capacity and ability to save lives in the future without increasing the total cost of operations," said Noomi Eriksson, Deputy Director General and Head of Maritime and Aeronautical Search and Rescue Department at the Swedish Maritime Administration.

Research and Innovation

The Swedish Maritime Administration is the initiator of and participates in a number of innovations and development projects.

MONALISA is one of the most noted projects. This, led by the SMA, was initiated in early 2010 and is a good example of how the development of new technologies can improve both the efficiency of sea transportation and the environment. The project aims at giving a concrete contribution to the efficient, safe and environmentally friendly maritime transport. This is done through development, demonstration and dissemination of innovative e-Navigational services to the shipping industry, which can lay the groundwork for a future international deployment.

The project activities include the ability to plan the ship routes more efficiently, and to create conditions in order to detect deviations from the planned route. Quality assurance of hydrographical data for the major navigational areas in Swedish and Finnish waters in the Baltic Sea contributes to improving safety and optimization of ship routes.

The MONALISA project has been widely acclaimed throughout the world, particularly after the *Costa Concordia* accident.

The future

Over the last years, the SMA has changed perspective from a traditional authority to a customer oriented service organisation with emphasis on high-quality products, service and branch-specific knowledge.

For example, the SMA is involved in looking at how to develop Swedish shipping infrastructure toward 2025 and 2050. Together with the Swedish industry and maritime stakeholders, the SMA is set to create an effective and sustainable transport system where all modes of transport interact optimally with the goal of achieving efficient logistics. As a service-producing enterprise, the SMA contributes to strengthen the competitiveness of shipping as well as to collaborate with other agencies for an economically efficient and sustainable chain of transports.

Being a modern and customer-oriented service organization that follows the industry trends, the SMA also focuses on new needs and innovation areas.

Without shipping, Sweden stops. That is why the Swedish sea routes are always open. 365 days a year, 24 hours a day.

History of the Swedish Maritime Administration

Maritime Administration has existed in Sweden in various forms for many hundreds of years, originally subject to the King and the Navy.

In 1950 the Government established a maritime organization committee with the task, *"To examine how the human and material resources within the maritime transport system, which were now available in several different administrations, could best be utilized. If the inquiry found that these resources should be combined into a single body, such a proposal should be submitted."*

The result of the study was that a new maritime administration was created. The birth date was 1st January 1956. It was called the Royal Board of Shipping and Navigation.

25 years earlier, Sweden had 80 manned lighthouse stations – some without either radio or telephone – pilots who owned their pilot boats – some without engines and 20 lightships, which rolled and pitched in heavy anchor chains outside its shores. Nowadays there are neither manned lighthouse stations nor lightships left and the pilots do not own the boats that take them to and from the ships to be piloted.

The new authority consisted of:

- The entire Royal Pilot Service;
- The entire Royal Hydrographic Office;
- Parts of the Maritime Bureau with the tonnage measurement system, the State's ice-breaking activities, the maritime prosecutor and the marine consultant and ship inspection; and
- Port Office and some channels from the Royal Civil Engineering Construction Authority.

The regional organization at that time was very comprehensive with all the piloting districts, piloting and lighthouse stations, inspection districts, channels, fish ports, and so on.

The Authority has to date been reorganized several times. In 1969 they would no longer be a royal authority, but purely and simply Swedish Maritime Administration. This organization functioned until 1987 when it became a public service company with virtually the organization that exists today.

Inspection of floating aids to navigation in the waters outside Oskarshamn.
Photos: Annika Johansson.

BY **Nick Cutmore**, SECRETARY GENERAL, THE INTERNATIONAL MARITIME PILOTS' ASSOCIATION

An introduction to **IMPA**

There is mention in ancient scripts of marine pilots and their work, thousands of years BC. In Greek and Roman times, locally experienced harbour captains, were employed by incoming ships' captains to bring their trading vessels into port. Not for nothing do we claim to be the world's second oldest profession.

Origins of the pilot and laws governing pilotage

The general term denoting a pilot in the early Middle Ages was lodesman deriving from the Anglo-Saxon *lād* meaning to lead or guide. The Pole star was known as the Lodestar. The terms *lods, lotse* and *loods* are used to this day in Scandinavia, Germany and The Netherlands. In its application for a charter in 1513, the Trinity House of Deptford used lodesman, pilot and pilot-lodesman, and at the same time the Court of Loadmanage of the Cinque Ports was active at Dover.

Laws covering pilotage were originally included in the several maritime codes from the islands of Rhodes (400 BC), Oléron (1199 AD) and Visby (16th Cent.). They produced maritime laws mostly covering the insurance aspects of maritime commerce. The Role d'Oléron provides rules for the employment of mariners demanding that the navigator be competent to take a vessel a certain distance from his base or home port and laying down the obligations of pilots.

In fact two of the articles relate to pilotage:

Role X111: A ships freighted at Bordeaux or La Rochelle or elsewhere and arrives at her place of discharge and has a charter-party, towage and petit lodemanage fall upon the merhants. On the coast of Britanny all those taken on after passing the Isle of Batz (off Roscoff) are petit lodesmen.

Role XX1V: A young man [=knave=mate=pilot] is pilot of a ship and he is hired to conduct her into port where she ought to discharge, it may well happen that the port where the ships are placed to discharge is a closed port… and the pilot has well done his duty when he has brought the ship safely to her berth, for so far he ought to conduct her and thenceforth the duty is on the master.

Further, in 1344 a law of the Commune d'Oléron defined petit lomant as one "*who stations himself at the entrance to ports and havens, well knowoing the dangers of the ports and havens.*" The sea pilot or ship's navigator was called Grand Lomant. And early in the 20th century a French pilot was often denoted *pilote-lamaneur.*

The term pilot, almost unknown outside the Mediterranean before the 15th century, stems from the Greek *plous* or *perlous*. A Periplous, in ancient times, was a form of sailing directions (*peri*=around or circle, *plous*=navigation: thus *periplous*=circumnavigation). *Plous* or *perlous* modified to pilot.

Above: *A busy pilot at work, continually in touch by radio with tugs and linesmen.*

Whilst some elements of the profession have not changed in millennia, such as climbing aboard using a hemp and wood ladder, in other respects modern marine pilots use state of the art equipment to supplement traditional skills of shiphanding and local knowledge.

Recognition at IMO

The criticality of pilotage to modern shipping operations was recognized in 1973 when IMO (then IMCO) granted the International Maritime Pilots' Association consultative status. IMPA exists primarily to represent its 8000 members worldwide at IMO, and to contribute to debate there on issues such as bridge design, navigation systems and safety regimes.

Maritime pilots provide an essential and unique service to the shipping industry. Their principal role is to:

- Provide critical independent local knowledge and navigational information to vessels.
- Bring the highest level of shiphandling skills to manoeuvre vessels within their port.

A critical public safety service

The prime obligation of pilots is to provide a critical public safety service by ensuring the careful management and free flow of all traffic within their pilotage area, thus protecting the environment.

Pilots need to be able to exercise their professional judgment undeterred by commercial or economic pressure. Pilotage is an essential part of a Port's Safety Management System and compulsory pilotage is considered to be the most effective and important form of navigation safety regulation.

Pilots come aboard vessels by small boat or helicopter at the most critical phase of a vessel's voyage to assist with the conduct of navigation in waters with limited draught, widths, variable currents and other traffic competing for space. Ships' masters cannot be expected to be fully conversant with the special navigational and regulatory requirements of an area.

Shiphandling skills and training

Pilots also bring highly developed shiphandling skills which are necessary with ever-larger ships and they bring the local communications knowledge necessary to work with local services such as tugs and linesmen. A pilot's training is of necessity long and thorough, given the value of ships and their cargoes. Pilots normally enter the profession after a career at sea and learn their new trade mostly by mentoring from a qualified and experienced pilot. This is typically supplemented by simulator training and model training. Thereafter, training continues on a constant basis to maintain skills to the very highest degree.

Relationship 'twixt Master and Pilot

The Master and Pilot relationship is an intriguing balance of mutual trust and respect, largely unwritten, which provides an unrivalled level of safety in a society that expects, and receives, the highest of standards from the shipping industry

Far from being a profession in decline, maritime pilots are needed today more than ever to handle huge vessels, often manned by very small crews, in ports which sometimes have hardly grown over a century or more. They are one of the contributors to a nation's sound import / export-based economy in that if the rivers and ports are safe, the ships will call. If passage safety cannot be guaranteed, vessels will stay away and the results are obvious.

Top: *A bulk carrier in Rotterdam.*

Middle*: An example of pilot ladders highlighting the potential difficulties to be encountered by a maritime pilot climbing a ship's side. A document was submitted to IMO reporting the results of a safety campaign carried out for one week in 2007 by pilots around the world, into the standard of ladders and ancillary boarding equipment provided for their use under SOLAS. Guidance is now available for naval architects and shipyards on the provision of pilot boarding arrangements. To drive the point home a ladder poster has now been prepared and is available for download in English, French, Spanish and Chinese. It is also available in laminated form from Witherbys Seamanship International at www.witherbyseamanship.com*

Lower: *Traffic under way on the Kaiser Wilhelm II Canal, the Kiel Canal, of 98km in length across Germany from Brunsbüttel on the North Sea to Kiel-Holtenau on the Baltic. It is said to be one of the busiest man-made waterways in the world.*

Main picture, right: *His life, in his hands alone on a ladder provided by a third party. For long IMPA has campaigned about poor conditions of pilot ladders. In 2007 it commenced a campaign to investigate and highlight standards of pilot ladders and associated equipment which resulted in changes to the SOLAS requirements. Pilot transfer at sea remains a treacherous part of the vital task needed to maintain the continuous pilotage service around the world.*

BY **Captain John Rose, Director** (MARITIME) OF THE UK-BASED CHARITABLE TRUST CHIRP, YOUNGER BROTHER

Top, and right, *examples of publicity material for CHIRP. There is more information to be found at www.chirp.co.uk*

International CHIRP Maritime

Learning from others through **CHIRP**

THE CONFIDENTIAL HAZARDOUS INCIDENT REPORTING PROGRAMME (CHIRP) investigates hazardous occurrences; namely those that nearly result in injury or damage and are often referred to as a "near-miss". The aim of CHIRP is to seek out root causes, identify the lessons learned and to consider how best this information can be used to prevent recurrence elsewhere in the maritime industry. CHIRP does not seek to apportion blame to any company or individual(s), the term 'whistleblowing' is not one used in CHIRP as that is often used to cast blame on an organisation or an individual.

A report can be generated either online (through a secure website), as a written report (via post/Freepost), or by telephone to the charitable trust's office in Farnborough. Reports come from professional and amateur participants in the maritime sector. Upon receipt all reports are validated by the Director (Maritime). Anonymous reports are not normally acted upon as they cannot be validated. User privacy is taken very seriously, always maintaining the confidentiality of the source. Thereafter only de-personalised data is used in discussions with third party organisations - always protecting the identity of the reporter. The same data is presented to the Maritime Advisory Board from whom advice and recommendation is taken as to whether there is benefit in sharing the results in the publication *Maritime FEEDBACK*. The results are also fed back to the reporter. On completion of the investigation, all personal details are removed from all files, only key information is retained in order to establish trends or identify root causes linked with Human Element behaviours.

To date over 800 hazardous occurrence reports have been reviewed, these include all aspects of vessel operations: cargo handling, catering, engineering, navigation, shipboard services, and activities at the ship/shore interface. However, the development of the programme has not followed a smooth path. It was originally considered in 1992 after the House of Lords Science and Technology Committee proposed a confidential reporting programme for the UK maritime community. But it took over ten years and a number of public inquiries into major maritime accidents in the UK, before Maritime CHIRP was established through funding provided by the Department for Transport. The programme was made available to the commercial transport, fishing and leisure communities simultaneously.

The Maritime CHIRP programme looked doomed for closure when in 2011 the UK government withdrew funding. The Trustees were required to look elsewhere and fortunately sourced sponsorship from the Corporation of Trinity House, the Lloyd's Register Foundation, and Britannia P& I Club. The programme has survived despite working with just 25% of the level of funds available when CHIRP Maritime originally started. The main achievements are the publication of *Maritime FEEDBACK* with a distribution of 33,000 copies and a social media site with over 900 followers from 46 countries.

Additional funding from new sponsors is being sought; this will enable reporting to become more readily available to a worldwide audience, this will be achieved through an increase in the distribution of publications to more than 100,000 copies and presentations at international conferences. A priority is to promote the importance of safety reporting and the provision of a reporting structure that is not always available to all seafarers. Those most likely to benefit are: seafarers operating in vessels with hazards or incidents not managed within an appropriate safety management system (SMS); seafarers with concerns over fatigue or stress related issues; seafarers encountering gaps in the interface between two safety management systems (bunkering, pilotage, repair yards), and ship managers whose ships encounter poor application of the Collision Regulations by another ship's officers.

Perhaps the largest challenge is convincing people to submit reports and increase their belief that a report will make a difference. A recent initiative involves working with the Nautical Institute MARS scheme, the aim being to establish an international network of voluntary ambassadors, designed to promote both schemes. For those unclear as to the difference between the two programmes; the MARS reports relay the lessons learned from the incident and near miss reports they receive, whilst in CHIRP each report involves pro-active follow-up and investigation of safety issues which otherwise may not have been reported to ship managers and authorities.

The Maritime CHIRP programme looked doomed for closure when in 2011 the UK government withdrew funding. The Trustees were required to look elsewhere and fortunately sourced sponsorship from the Corporation of Trinity House, the Lloyds Register Foundation, and Britannia P& I Club.

This page, above and facing page, middle: *shows some poor examples of working methods reported to CHIRP.*

Examples of hazardous occurences examined by CHIRP

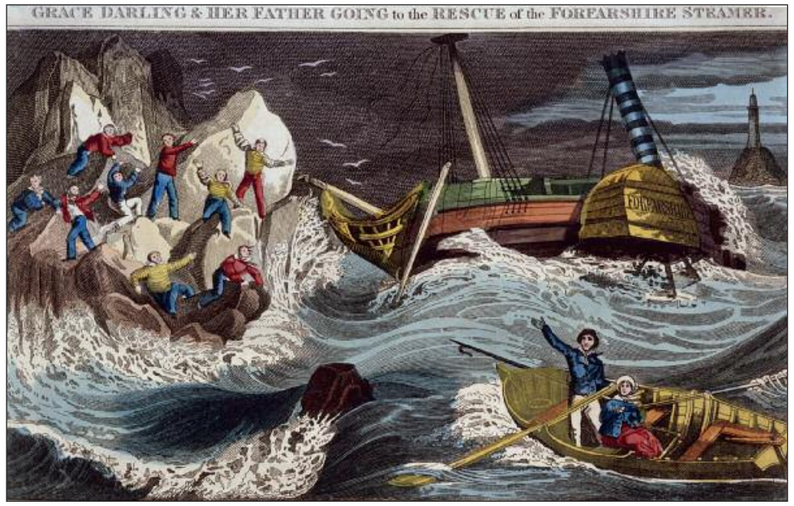
- A very hazardous operation in severe weather on an offshore vessel with potentially fatal consequence. This was followed up with the vessel operator, who took up the lessons learned and applied them to all the vessels in its fleet.
- Sailing club members injured by a shackle after webbing failed during the recovery of their safety craft. Advice provided on inspection of equipment, risk assessment and the need for supervision.
- Expert advice given on a concern expressed over the information contained in operational and maintenance manuals; where text can be inaccurate and/or poorly written and which can create confusion for the operator.
- Explosion as a result of heavy corrosion of an air bottle in a ship's lifeboat. This incident highlighted the importance of regular inspection and survey of all parts of a lifeboat, including bottles containing pressurised gas or air.
- A major argument witnessed between the Captain and the Pilot when entering port has highlighted the importance of establishing a positive relationship when the pilot first boards and then reaching agreement when the passage plan is discussed.
- A small passenger ferry was on passage when the vessel suffered intermittent power loss on both engines. The loss was due to blocked filters due to fuel bugs in the diesel fuel. This emphasised the need for increased care in small vessels in the storage of diesel especially where this contains biodiesel.
- Poor application of the Collision Regulations, led to feedback reiterating the need to take positive and early action when altering course, noting also that although there is often a reluctance to do so, reducing the speed of the ship can be used as an alternative means to avoid a collision.

To access past editions of ***Maritime FEEDBACK*** and to submit dangerous occurrence reports readers are invited to visit www.chirp.co.uk

GUIDING LIGHTS

500 YEARS OF TRINITY HOUSE AND SAFETY AT SEA

ON 15TH APRIL AT THE NATIONAL MARITIME MUSEUM GREENWICH HRH THE MASTER, accompanied by Vice-Admiral Sir Tim Laurence, opened a small exhibition, entitled *Guiding Lights*, introducing our work to coincide with the quincentenary and running until 4th January 2016. From this display in which 70 rarely seen objects from the Museum's collection and our own are shown, we publish here a representative selection.



Grace Darling statuette, circa 1900

Badge worn by Eddystone lighthouse workmen, 1757

All images © National Maritime Museum London

Top: *Print of Grace Darling and her father going to the rescue, 1838.*
Above left: *Watercolour sketch of a buoy, by William Lionel Wyllie, early 20th century*
Above right: *Watercolour sketch of the Nore light-vessel, by William Lionel Wyllie, early 20th century.*

Grace Darling was the daughter of the keeper of the Longstone lighthouse. One stormy night in 1838, the paddle-steamer Forfarshire was wrecked on some rocks nearby. Grace and her father, William, set out into the gale in their open rowing boat to rescue the survivors. This dramatic story gripped the popular imagination and prints were published to commemorate the event.

In this romantic representation, Grace Darling, the Longstone lighthouse keeper's daughter, appears eager to launch out through the storm to save lives. Grace died only four years after the rescue, of tuberculosis, but souvenirs continued to be made for many years afterwards.

An unidentified buoy, possibly Foulness. William Lionel Wyllie was a leading marine artist at the beginning of the 20th century. He and his wife shared a passion for sailing and he took a lively interest in all the details of the scenes around him. The watercolour sketches on display were probably painted during a family holiday on a Thames barge, described in their book London to the Nore painted and described by W L and Mrs Wyllie, 1905.

'Her mast stands in the middle of the ship, surmounted by a red ball and a big lantern, with the machinery for the revolving light built round the mast. At night … a wonderful ray it sends quivering round the horizon, lighting up for a moment the passing ships, which appear like ghosts and vanish.' London to the Nore painted and described by W L and Mrs Wyllie, 1905.

Maplin lighthouse warned ships away from the dangerous mudflats in the Thames estuary. It was designed by James Walker, consultant lighthouse engineer to Trinity House in 1838, and stood on nine screw piles driven six metres into the silt. Screw piles were ideal for the purpose, as they provided a secure foundation and were so slender that the sea flowed around them.

John Smeaton designed the third Eddystone lighthouse after Rudyerd's tower was destroyed by fire in 1755. To protect the workers from being press-ganged into the Navy, Trinity House arranged with the Admiralty to provide each man with one of these silver badges. Around the lighthouse are the words IN SALUTEM OMNIUM (for the safety of all) and EDISTONE RESURGIT (Eddystone rises again). *Guiding Lights* is part of the National Maritime Museum's continuing programme of exhibitions covering both historic and contemporary issues, providing visitors with an opportunity to engage and reflect on maritime stories in a more intimate setting.

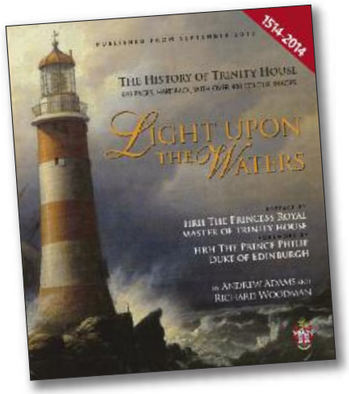
Exhibition information for visitors:
Opening times: every day, 1000–1700, late opening on Thursdays. Closed between Christmas and New Year. Readers are advised to check closure and other details with the Museum by telephoning: **020 8312 6565** or studying the website at: www.rmg.co.uk Admission is free.

LIGHT UPON THE WATERS

THE HISTORY OF TRINITY HOUSE 1514 TO 2014.

When Henry VIII granted a guild of mariners a Royal Charter in 1514, he could not have foreseen the changes the organisation would witness and influence over its first five centuries. To commemorate 500 years of its foundation, the Corporation of Trinity House publishes its history in this 320-page, richly illustrated volume, told by maritime historian Captain Richard Woodman and pilotage expert Captain Andrew Adams.

(ISBN 978 0 9575991 0 9) Price **£29.95**
To order please contact **Michelle Tindall**;
email: michelle.tindall@thls.org or
www.trinityhouse.co.uk/th500/books

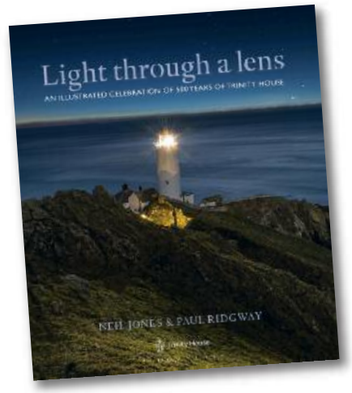


LIGHT THROUGH A LENS

AN ILLUSTRATED CELEBRATION OF 500 YEARS OF TRINITY HOUSE

This is a hardback book by Neil Jones and Paul Ridgway and is published by Bloomsbury and available from 11th September. Neil Jones has been Records Manager for Trinity House since 2005 and Paul Ridgway's association with Trinity House goes back four decades beginning as a PR assistant at Headquarters on Tower Hill in 1972. This is an annotated collection of illustrations of the 500 year history of Trinity House and contains rarely-seen archive photographs of Lighthouse Service operations in our waters. ***(Due in September 2014)***.

(ISBN 978 1 4081 7 595 8) Price **£20.00**



HONOURS & APPOINTMENTS

We send our congratulations to the following Members of the Fraternity who were recorded in HM The Queen's New Year and Birthday Honours Lists this year:

Captain Richard Woodman, FNI FRHistS, Elder Brother, appointed LVO.

Vice-Admiral Philip Jones, CB, Younger Brother, appointed KCB.

Rear-Admiral John Lippiett, CB MBE, Younger Brother, appointed CBE.

Commodore Paul McAlpine, OBE RN, Younger Brother, appointed CBE.

Rear-Admiral Matthew Parr, Younger Brother, appointed CB.

Rear-Admiral Duncan Potts, Younger Brother, appointed CB.

In June HM The Queen approved the appointment of **Admiral the Lord Boyce KG**, GCB, OBE, DL, Elder Brother, as Admiral of the Fleet.

COMPETITION TIME

Q Who was the first Engineer-in-Chief of Trinity House, London?

A The closing date for entries is Monday 1st September 2014. All the correct answers will be entered in to a draw and one lucky winner will receive a print of a Peter Kent picture whose work is shown in the centre pages of this edition of ***FLASH.***
Entries can be posted to: The Editor, ***FLASH***
Trinity House, The Quay, Harwich, Essex, CO12 3JW

COMPETITION WINNER

We are pleased to report that Alan J Nicholas of Seaton, Devon, won the competition draw in *FLASH* No 20, Winter 2013 and correctly identified Sir Thomas Spert as the first Master of the Corporation of Trinity House, London. He has now received his copy of ***Light Upon The Waters: The History of Trinity House 1514 – 2014*** by Captain Andrew Adams and Captain Richard Woodman.

LIGHTHOUSE PHOTOGRAPHIC COMPETITION

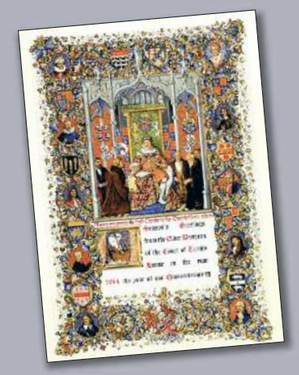
As in past years we are running a competition to find the best photographs of our lighthouses. Entrants are invited to submit pictures of any of our lighthouses. The twelve winning photographs will be published in the 2016 Lighthouse Calendar produced in association with leading calendar producer J Salmon Ltd. The photograph deemed the overall best entry will win a short break in one of the lighthouse holiday cottages.

Last year's winner: *Dungeness Lighthouse by Kevin Burchett.*

This competition closes on 28th February 2015. Further details about the competition, including rules and an entry form can be obtained from the website: **www.trinityhouse.co.uk/photo_competition**

CHRISTMAS CARDS

The 2014 Trinity House Christmas Card is printed in full colour and commemorates the grant of Henry VIII's charter to Trinity House in 1514 as seen here with this message inside:
"All Good Wishes for Christmas and the New Year".

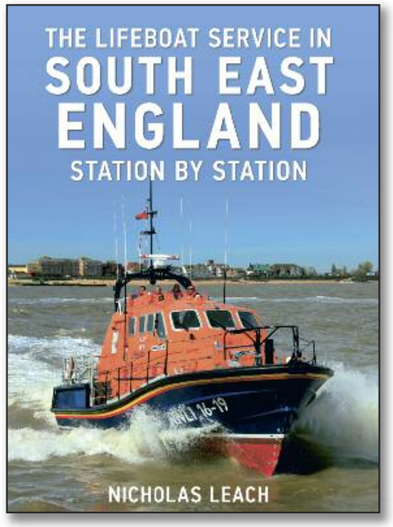


Each card will be approximately A5 in size and will be sold in packs of ten with envelopes. In due course the price (excluding post and packing) will be announced. The cards may also be collected from Trinity House.

To order readers may wish to keep an eye on the website at: **www.trinityhouse.co.uk/shop**

The Lifeboat Service in South East England
Station by station

By **Nicholas Leach** Published by Amberley Publishing, Stroud, Gloucestershire. 160 pages Paperback, ISBN 978 1 4456 1750 3
Price **£15.99**



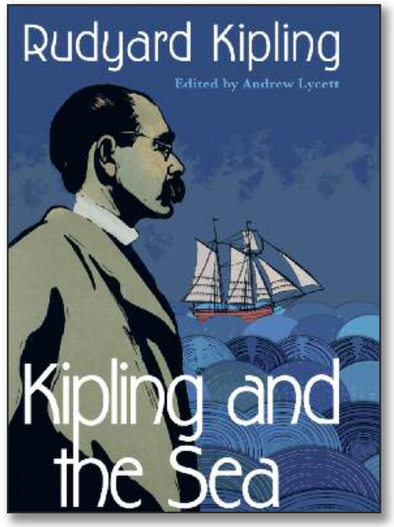
The RNLI was founded in 1824, and has a long and proud tradition of saving life at sea. This is evident in the waters of the south east of England where the lifeboats and crews of Norfolk, Suffolk, Essex and Kent have been involved in so many dramatic, courageous and daring rescues in the history of the Institution. Here this book provides details of some of the recorded launchings and the work of the lifeboats in these waters.

Currently, the RNLI operates 27 lifeboat stations hereabouts and this useful volume provides details of each with notes on their history, rescues and current craft on station. Also provided are details of earlier stations, for example that at Harwich in 1821, before the founding of the Institution. Four new stations are now operating in the London River: at Gravesend, Chiswick, Tower and Teddington where each has been since 2002.

Nicholas Leach, an accomplished author on lifeboat matters, has amassed a wealth of information about his subject. He visited each station to provide his record of RNLI operations off East Anglia, the Thames Estuary and the Dover Strait with more than 350 illustrations, many in colour. Four appendixes give a useful bibliography, information on independent (that is to say not RNLI stations), lifeboats on display and the types or classes of lifeboats employed.

Kipling and the Sea

Introduced and edited by **Andrew Lycett**
Published by I B Taurus & Co Ltd., London.
244 pages Hardback, ISBN 978 1 78076 273 9
Price **£19.95**



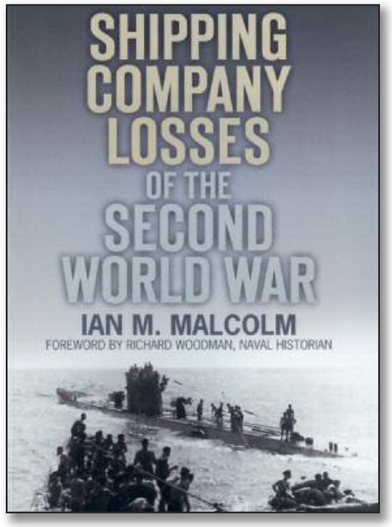
Subtitled: ***Voyages and Discoveries from North Atlantic to South Pacific***. Rudyard Kipling may be best known as a commentator on the British Empire, and particularly the Army, but he was also an observer and chronicler of the sea, and of ships and all who sailed in them. He wrote copiously about his own voyages to India, across the Pacific, Atlantic, to South Africa and Australia. He also wrote about other's voyages and was aware that the sea provided the sinews which brought the British Empire together. Sailors were his heroes, as adventurers who braved every element and danger to reach distant lands. In writing about them he was enthralled by the romance of the sea, touching on everything from pirates to technical changes in ships. His output reflected his understanding of maritime affairs and he was a staunch advocate of the Royal Navy and wrote about its many faceted role.

Lines that come to mind with this reviewer are of *ERA 1 Hinchcliffe, "Give'im a drum of oil and leave him alone, and he'll coax a stolen bicycle to do type-writin'". Further, the shipping lines in China-going P&O's, names still with us, "…Near the track of most BI's. / NYK and NDL…"*

At all stages of his life Kipling peppered his many letters with maritime record.

Shipping Company Losses
of the Second World War

By **Ian M Malcolm** Published by The History Press, Stroud, Gloucestershire. 272 pages Paperback, ISBN 978 0 7524 9342 8
Price **£19.99**

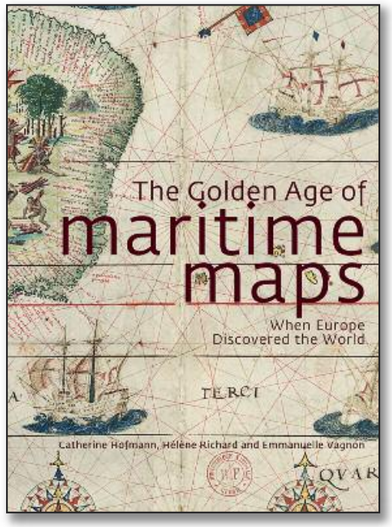


Being on Tower Hill we cannot fail to be aware of the human and material cost of both world wars as we view the Merchant Navy War Memorials across the gardens. During the Second World War, the MN suffered a higher percentage loss than any of the British armed forces, but despite this extraordinary fact few people today are aware of it and of how the MN saved the nation from starvation through the longest campaign of all, the Battle of the Atlantic. This book is an important volume attempting to dispel the ignorance, and for the first time brings together a wealth of information concerning ship losses in respect of 53 British shipping companies. A former wartime MN Radio Officer Ian Malcolm presents a view that is staggering in scale. In total, 33,000 merchant seamen died, while others were severely injured both physically and mentally.

Captain Richard Woodman, Elder Brother, has written the foreword for this amazing compendium listing shipping companies in alphabetical order with their losses similarly shown with the Master's name and brief circumstances of the final voyage and the tragic loss. To conclude there is a valuable list of further reading including relevant websites and an index of ships' names. This work will be of great value to shipping enthusiasts and anyone interested in the war at sea.

The Golden Age of Maritime Maps:
WHEN EUROPE DISCOVERED THE WORLD

Produced under the direction of **Catherine Hofmann, Hélène Richard** and **Emmanuelle Vagnon.** Published by Chris Lloyd Sales & Marketing, Poole, Dorset. 256 pages Hardback, ISBN 978 1 77085 238 9 Price **£35.00**



Portolan charts, so called from the Italian *portolano*, meaning "related to ports or harbours," were created during the 12th century. They were drawn on parchment and crisscrossed with lines indicating compass directions for ports and anchorages and were used by Europeans exploring the world up until the 18th century. Not only used as navigational aids by those afloat they were also produced for wealthy sponsors in the form of illuminated images to illustrate economic and political interests of the major European sea powers. This book takes stock of the state of knowledge on these maps, bringing together contributions from a group of European specialists who trace the history and diversity of styles and places of production. This type of mapping is approached from three angles: the first part, the Mediterranean with the manufacture and use of the first chart; the second part being the Open Sea shows how regional charts evolved from a technical and iconographical point of view and, thirdly, the Indian Ocean, which indicates how charts embraced other cartographic traditions of, for example, the ancient, the Arab and the Asian. The directors, Hofmann, Richard and Vagnon, have carried out an amazing task bringing together this collection of 300 high quality illustrations from a multitude of sources including the National Library of France which holds 500 examples of exceptional quality.

Quincentenary merchandise

To request an order form or to order direct please contact:
Michelle Tindall, The Corporation of Trinity House, Tower Hill, London EC3N 4DH
Enquiries: Michelle.Tindall@thls.org or 020 7481 6924
Payment can be made by cash, cheque, debit or credit card. All cheques are to be made payable to "Trinity House Events Ltd". *Please note that we do not accept American Express cards.*

MUG
Special edition half-pint mug commissioned from the Emma Bridgewater pottery company.
£16.00 each

CASHMERE SCARF
Scarf with Trinity House arms and dates embroidered; available in dark blue or cream. **£52.00** each

Trinity House-themed £2 coin.

On the 19th May the Royal Mint announced that to mark the 500th anniversary of the granting of the Charter by HenryVIII in 1514 it had produced a limited edition commemorative Trinity House-themed £2 coin in sterling silver and 22 carat gold. This carries a striking lighthouse design by Joe Whitlock Blundell and David Eccles. The design also appears on the circulating version of the £2 coin which you will doubtless find in your loose change from October. Each coin is edged with the words SERVING THE MARINER.


The Trinity House-themed £2 coin.

Quincentenary coin and First Day Cover

Issued in a limited edition of 10,000 by the Royal Mint a coin cover pays tribute to the Corporation of Trinity House in our 500th anniversary year and at the same time Southwold Lighthouse will be featured as part of a seaside architecture stamp set.

This coin cover will contain the £2 coin and bear the Southwold Lighthouse stamp. The front of the envelope carries a photograph of Beachy Head Lighthouse while the reverse features a map of England and Wales pinpointing our 63 lighthouses. Maritime history writer and photographer Richard Johnstone-Bryden has contributed a brief summary of the origins of the Corporation, as well providing a timeline of our history and current responsibilities; this contains a quote from HRH The Prince Philip, Immediate Past Master of the Corporation.

On the first day of issue, 18th September, there will be a handstamp featuring a line drawing of a lighthouse lantern while the postal location of Lowestoft on the postmark refers to our first lighthouse construction, of 1609. To obtain the coin cover and the first day cover readers are invited to take a look at: **www.royalmint.com**

CONTACTING TRINITY HOUSE If you wish to make future contributions to ***FLASH***, please forward your information, and a photograph if possible, to Neil Jones. His contact details are on the inside front cover of this edition. *To make the most of your images in print, they should be submitted as 300dpi jpegs – the larger the image file the better – please do not embed the image within a Microsoft Word file.*
Latest date for submissions: 12 September 2014.

Congratulations to...

WEDDINGS

Procurement's **Jade Walker** married **Stuart Holsgrove** on Saturday 24 May 2014 at St Michael's Church in Ramsey, Harwich. The new Mr and Mrs Holsgrove will go on honeymoon later this year.

BIRTHS

Danny Lowther, HR, and partner **Samantha Tarrant**, a son, ***Ronnie Daniel Albert***, on 2 April. He weighed 9lb 5oz and is a younger brother to three year old Archie.

Craig Ramsay, SVS, and wife **Lindsay**, a son, ***Robbie James***, on 1 May. Robbie weighed 7lbs 14oz.

Ben Lankester, SVS, and fiancée **Susanne Höse**, a daughter, ***Lena*** on 5 May. Lena weighed 6lbs 2ozs.

Sally Stacey, Procurement, and partner **Matt Ennals**, a son, ***Jake Christopher***, on 11 May. Jake weighed 8lbs 6oz.

CONGRATULATIONS

We send our congratulations to **Malcolm Nicholson**, Principal Development Engineer, at Trinity House Harwich who has been elected to Fellowship of the Royal Institute of Navigation. This is in recognition of his contribution to the development of visual aids to marine navigation and thus the safety of navigation.

STARTERS AND LEAVERS

Welcome to the following new members of staff who have joined us between 1 October 2013 and 31 May 2014.

Harwich

Phillip Cruddace, PR/ACCSEAS Administrator (Fixed Term), on 10 October.
Angela Duncan, Light Dues Administrator (Fixed Term), on 5 December.
Natalie Todd, Finance Administrator (Fixed Term), on 19 March.
Edward Homer, Buoy Yard Team Member, on 24 March.
Christian Robinson, Purchasing Administrator (Fixed Term), on 14 April.
Craig Neil, Buoy Yard Team Member, on 8 May.
Frances Campbell, Receptionist (Part Time), on 19 May.

St Just

Douglas Milburn, Lighthouse Support Team Member (Fixed Term), on 17 March.

SVS

Samantha Mason, Second Officer (Fixed Term), on 16 October.
David Pascoe, Engine Room Assistant (Fixed Term), on 6 November.
Frazer MacInnes, Trainee Deck Rating (Fixed Term), on 8 January.
Steven Banks, Trainee Deck Rating (Fixed Term), on 8 January.
Daniel Adams, Seaman – Auxiliary, on 8 January.
Jake Fisher, Trainee Deck Rating (Fixed Term), on 29 January.
Ian Garner, Seaman, on 29 January 2014.
Ian Mills, Seaman (Fixed Term) on 29 January 2014,
Andrew Cage, Seaman, on 19 February 2014.
Jonathan Rowlands, Trainee Catering Rating (Fixed Term), on 12 March.
Adam Keen, Second Officer, on 12 March.
Mark Winter, Seaman, on 2 April.
Charlotte Black, Second Officer (Fixed Term), on 28 May.

Tower Hill

David Ring, Non Executive Director (Fixed Term), on 1 December.
Lucy Smith, Navigation Department Administrator (Fixed Term), on 6 January 2014.
Graeme Proctor, Inspector of Seamarks, on 31 March 2014.
Anthony Tibbert, Examiners (Fixed Term), on 1 April 2014.

LEAVERS

We bid farewell, extend our thanks for their service and wish them well in their futures to:

Harwich

Ron Blakeley, Principal Civil Engineer, after 22 years service.
Carl Schofield, Buoy Yard Team Member, after less than one year of service.
Philip Woods, Buoy Operations Manager, after five years service.
Edward Homer, Buoy Yard Team Member, after less than one year of service.
Conor Dale, Buoy Yard Team Member (Fixed Term), after less than one year of service.

SVS

Dale Callaby, Trainee Catering Rating (Fixed Term), after two years service.
Alex Davis, Second Officer, after three years service.
Michael Green, Carpenter, after 14 years service.
Travis Cook, Apprentice (Fixed Term), after one year of service.
Scott Sanderson, Seaman (Fixed Term), after less than one year of service.
David Croucher, Seaman, after ten years service.
Robert Sommerville, Second Officer, after six years service.
Timothy Iles, Second Engineer – Auxiliary, after less than one year of service.
Melissa Goddard, Cook, after 12 years service.

Swansea

Jeffrey Westwood, Buoy Yard Supervisor, after 30 years service.
John Mainwaring, Buoy Yard Team Member, after 19 years service.
Garry Davies, Buoy Yard Team Member (Craft) after 25 years service.

Tower Hill

Georgina Jones, Navigation Department Administrator (Fixed Term), after one year of service.
Richard Wynn, Inspector of Seamarks, after five years service.
Duncan Glass, Examiners (Fixed Term), after four years service in this role.
James Manson, Advisor (Fixed Term), after two years service.

OBITUARIES

It is with great sadness we report the deaths of:

Michael Williams, former Assistant Keeper, on 2 October 2013, aged 63. He served 21 years.

Margeret Joan Dennis, former HEO (Pay Unit) – Harwich, on 23 August 2013, aged 83. She served 17 years.

Ronald Jeffreys, former Senior Craftsman – Harwich, on 31 October 2013, aged 81. He served 17 years.

Anthony James Wilding, former Engine Room Assistant – SVS, on 20 October 2013, aged 74. He served 13 years.

Kenneth Rowley, former Assistant Keeper, on 20 October 213, aged 74. He served 15 years.

Michael John Nedin, former Craft Painter – Swansea, on 11 October 2013, aged 61. He served ten years.

David Knight, former Assistant Keeper, on 15 November 2013, aged 78. He served 23 years.

Frederick Harry Saul, former ER2 – SVS, on 26 November 2013, aged 83. He served seven years.

Thomas Graham Forster, former Engineering Superintendent – Harwich, on 11 October 2013, aged 65. He served 28 years.

Eric Ellsmore, former Foreman of Works – Penzance, on 25 December 2013, aged 82. He served 20 years.

Maurice Ernest Wilsher, former Fitter – Blackwall, on 28 May 2013, aged 93. He served four years.

Patrick Peter Leary, former Labourer – Swansea, on 7 January 2014, aged 87. He served 15 years.

Andrew John Balls, former Electrician – Harwich, on 12 January 2014, aged 65. He served 20 years.

Marie Read, former Typist – Harwich, on 22 February 2014, aged 90. She served seven years.

Ronald Critchett, former Assistant Keeper, on 11 January 2013, aged 81. He served seven years.

Desmond Williams, former Paintsprayer – DLF, on 1 January 2014, aged 71. He served seven years.

Denis William Bird, former Master – LVS, on 25 March 2014, aged 89. He served 17 years.

Vincent Stephen Pearce, former Principal Keeper, on 27 February 2014, aged 82. He served 36 years.

Brian Lane

On 16th May 2014 at the age of 72 suddenly after a short illness. He retired as the Corporation's Maintenance Manager in 2007.

He joined the London Graving Dock at Poplar at the age of 15½ on a multi-trade apprenticeship in 1957 and by the age of 30 was the youngest shipyard foreman on the London River. The yard was a major ship repair business and for many years two of its clients were the Trinity House Pilot Vessel Service and the RFA which dry-docked and repaired here. In 1979 he joined Trinity House Workshops Blackwall where he worked as a boilermaker fabricating buoy bodies and the many examples of steelwork required in light-house engineering, particularly on the automation programme, around the Service.

Following the closure of Workshops in 1987 he returned to Trinity House, this time to Tower Hill, in 1990 as the Corporation's Maintenance Engineer with responsibilities including the supervision of the cleaning of the House, preparation of ceremonial rooms for events and routine maintenance including guidance of contractors during the annual Summer refit thus ensuring the best facilities for our clients. He was appointed Maintenance Manager in 2001.

For ten years he carried the Corporation's mace at the Annual Meeting of the Court each Trinitytide. He was an accomplished shot and for more than 40 years a dedicated wildfowler on the Essex marshes.