THE PILOT

The official organ of The United Kingdom Pilots' Association

No. 179 (Vol. 49. No. 8) October 1976

10 DOWNING STREET

29th July, 1976.

Dear Mr Eden

I am very sorry that I have had to make the decision to resign from the office of President of the United Kingdom Pilots Association. I was greatly honoured when I was first approached in 1963 to become President and have very much enjoyed our association and the friendships I have made.

The United Kingdom Pilots Association is of immense benefit to its members, and I am sure that it will have continuing success.

Yours sincerely

Jim Callaghan

Edgar Eden, Esq.,
General Secretary,
United Kingdom Pilots Association.

PRESIDENT

Members will be extremely disappointed to learn that The Rt Hon James Callaghan, PC, MP, has relinquished the Presidency.

An appreciation of his work as President of the UKPA since July, 1963, will appear in the next issue of *The Pilot*.

UNITED KINGDOM PILOTS' ASSOCIATION

20 Peel Street, London, W8

(01-727 1844)

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1974	J Bennett (South East Wales) Brent Knoll, 92 Port Road East, Barry, South Glam.	(Barry 4724)
1974	G A Coates (Tees) 9 Stokesley Road, Marton, Middlesbrough, Cleveland	(Middlesbrough 35236)
1974	J A Hogg (Tyne) 20 Langdon Close, Preston Grange, Tynemouth, Tyne and Wear	(North Shields 73864)
1975	K Grant (Southampton and Isle of Wight) 172 Bassett Green Road, Southampton, Hants.	(Southampton 69291)
1975	J A Edmondson (Cinque Ports) "Tiroroa", Granville Road, St Margarets Bay, Nr Dover, Kent CT15 6DT	(Dover 852933)
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A New Breed of

RUDDER PROPELLER TUGS

R Crosthwaite

Joint Managing Director, Tees Towing Company Limited

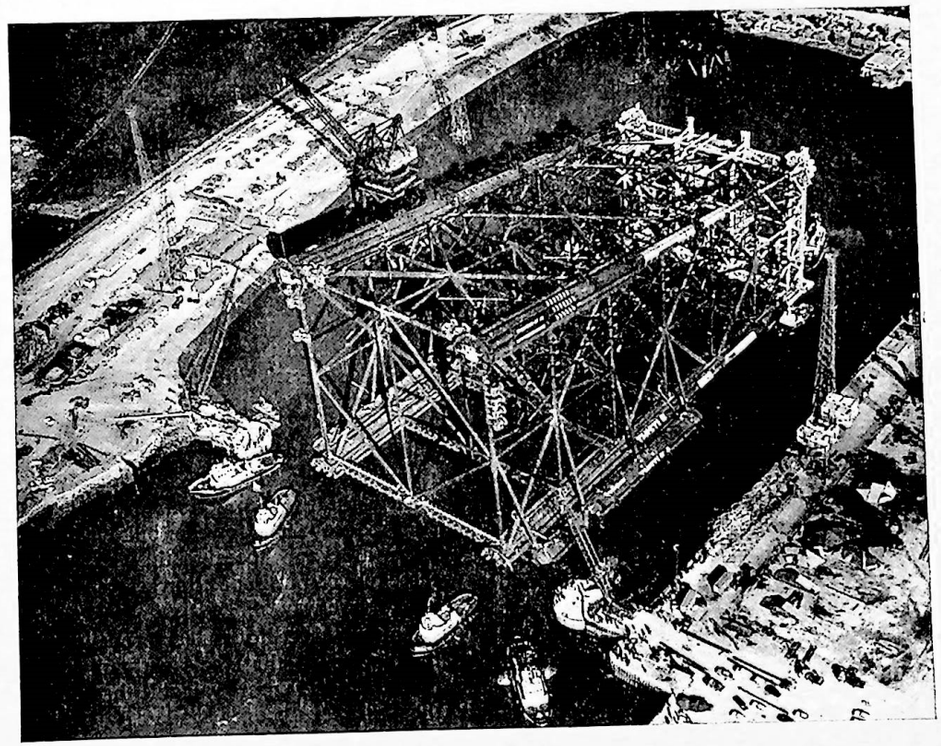
The photograph of the Thistle "A" rig shows a number of apparently conventional harbour tugs towing the third of Laing's oil platforms along the Seaton Channel towards the River Tees. Laings thought it advisable to bring two Voith Schneider tugs from Rotterdam and two Schottel tugs from Hamburg to assist in the towage of the first two oil platforms constructed at its Graythorpe Yard. They were glad to use two additional Schottel tugs from the local tug company for the third platform.

It is understandable that a Company should wish to safeguard a £20 million asset like the Thistle "A" rig, even if it means bringing specialist tugs from abroad, as few pilots would dispute that the sideways thrust of a rudder propeller tug could make a considerable difference to an oil rig moving in a channel which is only a few feet wider than itself.

However, the layman might wonder why a harbour towage company like Tees Towing Company Limited should spend so much time and money in designing and building two Schottel tugs like the *Greatham Cross* and the *Skelton Cross* in order to handle comparatively normal ships.

The answer lies in the "abnormality" of most apparently normal situations. For these three reasons:

Breathe In! The structure of oil rig *Thistle A* being towed through the Seaton Channel to the River Tees (Gerald Coates was piloting)



(1) In its upper reaches, the River Tees is normal enough in that dock entrances and dredged channels originally constructed for vessels in the 10,000 ton range should now have to do service for vessels twice that size. It must be a relief to most shipowners to know that ton for ton the pull exerted is costing him less than that exerted by other types of rudder propeller tug which cannot take advantage of a nozzle type of propeller. It must also be a relief to most pilots to know that in such circumstances a Schottel tug will be able to exert a pull on the ship's bow or stern in considerably less time than it would take a conventional tug.

(2) Due to its geographical position, the River Tees is well placed for module construction work intended for oil rigs. The towage of large but light module barges on the river has been greatly simplified by using Schottel tugs in situations where it is common to find barges being damaged because a normal tug cannot exert a small enough, or sensitive enough, pull.

(3) However, the main "abnormality" of the apparently normal Tees lies in the ease with which the Port Authority have been able to provide deep water berths, in close proximity to the open sea.
The proliferation of jetties at the Ekofisk terminal and the Redcar Ore Terminal have meant that many vessels in the 70,000 ton to 200,000 ton range have to be manoeuvred in a narrow waterway only a few hundred yards from the Bar of the River.

In such a situation, a pilot likes to keep the screw of the incoming vessel moving until she is over the Bar and in comparatively sheltered waters. But if this is done, it leaves the pilot comparatively little time to stop the vessel in the vicinity of the jetty. This is because conventionally steered tugs do not have time to go round on their tail ropes until most of the vessel's way has been taken off. By this time the vessel may be dangerously close to shallow water and, if she has canted the wrong way, it may be many minutes before the tug is in a position to tow the vessel into safer waters.

To these hazards must be added the totally new hazard of large oil tankers entering a British Port in a **light** condition. The Tees has for some years **imported** more oil than many European ports, but from the day when the first tanker arrived at the Ekofisk terminal, it became the premier oil **exporting** port of Europe.

Three years ago, the Management of Tees Towing Company Limited faced this problem and set about finding a way of assisting large light tankers needing a pull shortly after leaving the open sea. They decided that a conventional tug would not fit the bill. Voith Schneider tugs—which were pioneered by the Company twenty years ago—were thought to be too expensive for their pull-to-horsepower ratio.

The photograph illustrates the solution they found and why the Schottel propellers on the *Greatham Cross* and the *Skelton Cross* allow these tugs to exert a pull in any direction. In effect, this means that they are able to achieve the following three things:

(1) Elimination of the girting factor by placing the tow hook in the stern of the tug.

(2) Accurate control of the tug when moving astern near the propeller of an incoming tanker and when towing a vessel stern first.

(3) The ability to adjust the tug's position at the stern of a stopping tanker with great speed and efficiency.

These two tugs have only been in service on the Tees for two months, but they have already proved that they can handle large incoming vessels in the circumstances described. The tug crews are happy because they can get close to a ship without putting themselves in danger; the shipowners are happy because they know that in the right conditions Schottel tugs can reduce their towage bills, and the pilots are happy because they know that these tugs can be in position **before** the ship has to take way off.

This new breed of rudder propeller tugs has confirmed that the right pull at the right moment is more valuable than double the pull a few seconds too late.

The PILOT

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The United Kingdom Pilots' Association,
20 Peel Street, London, W8

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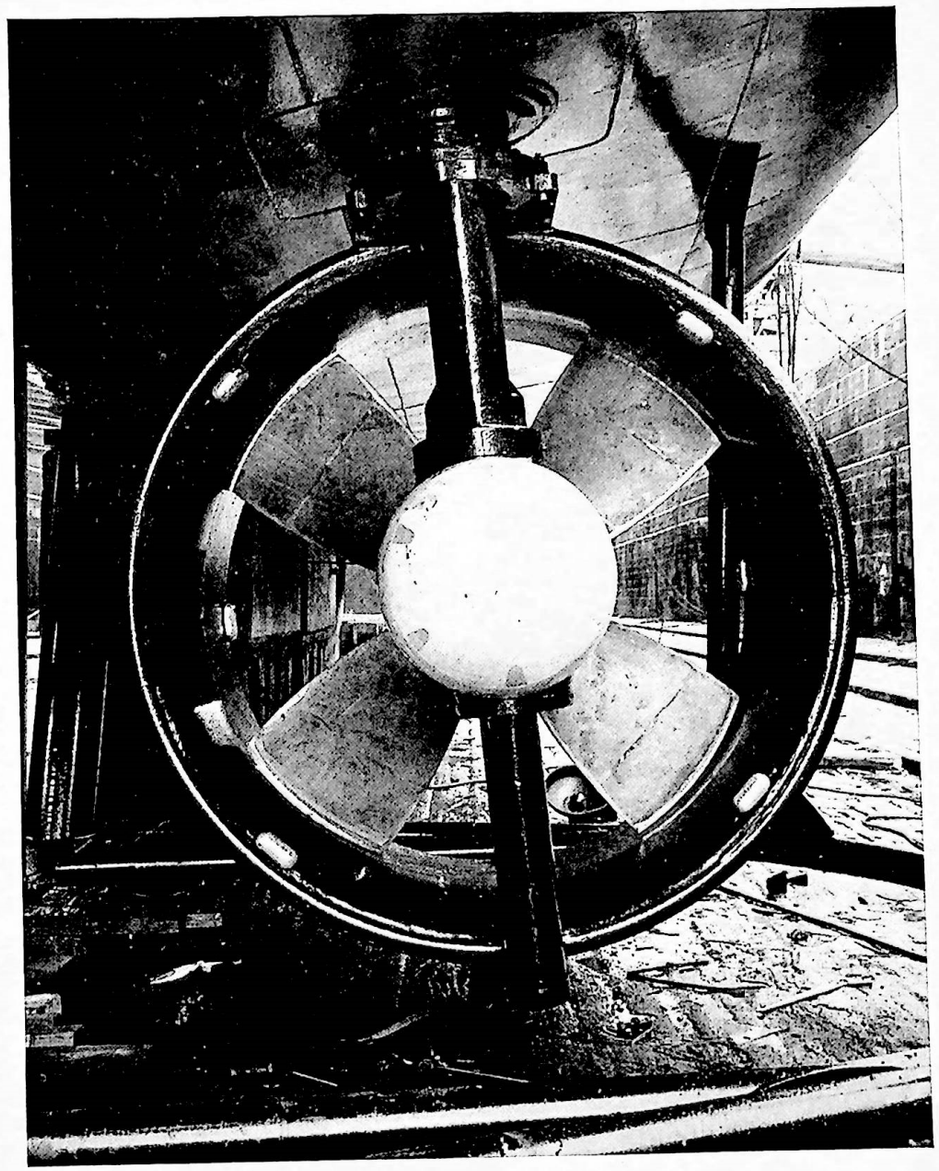


One of the Schottel units on the Tug *Greatham Cross*

SCOTTISH GUILD OF PILOTS

A Scottish Guild of Pilots has been formed. The objects of the Guild are to progress the policy as stated in the Department of Trade & Industry document *Marine Pilotage 1975*, with particular reference to the formation and operation of a Scottish Pilotage Committee, and to represent all pilots who are members of the Guild in dealing with all piloting matters of a Scottish nature.

PILOTS VOICE TOTAL OPPOSITION

to Government's proposals to extend the issue of

PILOTAGE CERTIFICATES TO FOREIGNERS

At a Special Conference held in London on 6th September, 1976, delegates unanimously passed the following resolutions:

(i) That this Conference totally opposes the implementation of Recommendation 12 (the extension of pilotage certificates to foreign nationals) and will actively do so by every means available.

(ii) Further, that this Conference directs the UKPA Executive to advise the Department of Trade forthwith that the proposed legislation towards the new Pilotage Bill will be opposed until the controversial points in the *SCOP Report*, the Government's *Policy Statement* and the *Outline of Main Provisions on Pilotage* have been further discussed and agreed.

NEWS FROM THE EXECUTIVE

Some of the more important items considered at the last meeting of the Executive Committee held on 12th/13th July, 1976, were:

(i) Detailed consideration was given to discussions which took place with the Department of Trade on reorganisation. In the light of the Government's failure to reassure the UKPA on a liberal attitude to the issue of pilotage certificates, particularly to foreign nationals, it was agreed that in the first instance a preliminary meeting should be arranged with various local representatives of pilots with a view to paving the way for a further Special Conference.

(ii) Discussions took place on the correspondence relating to the setting up of a Trinity House Advisory Board. The view was again reiterated that this was just another tier in the Trinity House administration, and what was required was pilot representation on the Board of Trinity House itself.

(iii) Consideration was again given to the cases of the late L K Mitchell and C C J Neaves, which demonstrated the need for an insurance cover to pursue legal claims in the Courts. It was agreed to bring this matter to the attention of Conference.

(iv) Discussions took place on a report dealing with a demonstration of the Decca Ship Simulator, and it was suggested that the National Technical Committee should give an assessment of the value of such a simulator to pilots in training or familiarisation.

(v) Matters arising at the Board of Management of the Pilots' National Pension Fund were discussed, in particular the need to institute a double-check of the calculations of pensions to try to obviate errors in the future.

Obituary

BILL MARSHALL

Captain William Richard Bennet Marshall, aged 66, died suddenly in his sleep on June 16th, 1976, at his home in Barrow-in-Furness, Cumbria. From being Master in the vessels of James Fisher & Sons Ltd, he joined the Trinity-House Pilot Service (Barrow and Heysham District) in 1948, retiring due to ill health in September, 1971.

Prior to his retirement he was a keen golfer and was Captain of his local club for several years. A year after his retirement he lost his sight completely, and from then until his death channelled his energies into learning Braille and entering fully into the activities of the local Association for the Blind. Starting his seagoing career as a "boy" in the Appledore schooners, from which district he hailed, he frequently kept his colleagues amused with his stories of his exploits in sail. Better known in the Northwest as "Bill" Marshall, he will be sadly missed by all.

THE DECCA SHIP SIMULATOR

The Decca approach to developing a ship simulator has been essentially pragmatic. In order to appreciate the practical rather than theoretical approach which has been taken, and how this has led to the type of solution adopted, it may be useful to give a little of the history of the work.

The simulator started life as a simple radar simulator, used to provide an operational test bed for in-house research and development into improved radar presentations. This soon proved its worth and it was extended to simulate hyperbolic radio aids and navigational problems. Later again, autopilots were included and this involved adding an acceptable simulation of ships' steering characteristics and a simple (heading change only) daylight visual presentation.

In 1972 a discussion with DTI took place on whether this simulation facility could be modified to conduct research into the use of simulators for examining the effects of varying water depths on the handling of VLCCs. It was realised that this exercise would require an improved visual presentation with the proper perspective changes, but the exercise was to be a low cost one. It was also realised that there was no possibility of providing an adequate and acceptable daylight view within the allowable cost but it was considered that a good night-time view of the lights of a buoyed channel could be provided; this would be done by using computer-controlled projectors. A small contract was placed with Decca Radar Limited to provide this presentation, to improve the manoeuvring simulation to take account of varying water depths and to conduct trials with VLCC Masters and Pilots.

The Experimental Simulator

This simulator had a wheel, autopilot, throttle, radar, navigational aids, chart table, compass repeaters, etc., and a night-time visual view through a bridge window.

A very large number of tests was carried

NEVILLE CHAMBERS

We sadly record the death of Edmund Neville Chambers who died at his home on August 25th after a short illness.

Born in 1914, he was apprenticed to Ellerman Hall Line, served on deck during the depression, was an officer with Alfred Holts until obtaining his Master's Certificate in 1942. During the war he was engaged on Admiralty duties and was involved in the Normandy *Mulberry Harbour* operation. In 1946 he was master in salvage vessels and worked on dredgers until he became a Trinity House Pilot at Preston in 1949.

Since 1959 he has been sub-Commissioner and UKPA representative for Preston. During the past few years he has been a member of the Executive Committee of UKPA and was recently appointed to the Trinity House Pilotage Advisory Board.

He will be sadly missed by his colleagues, who appreciated his great understanding and energetic handling of pilotage affairs. We express our deepest sympathy to his widow.

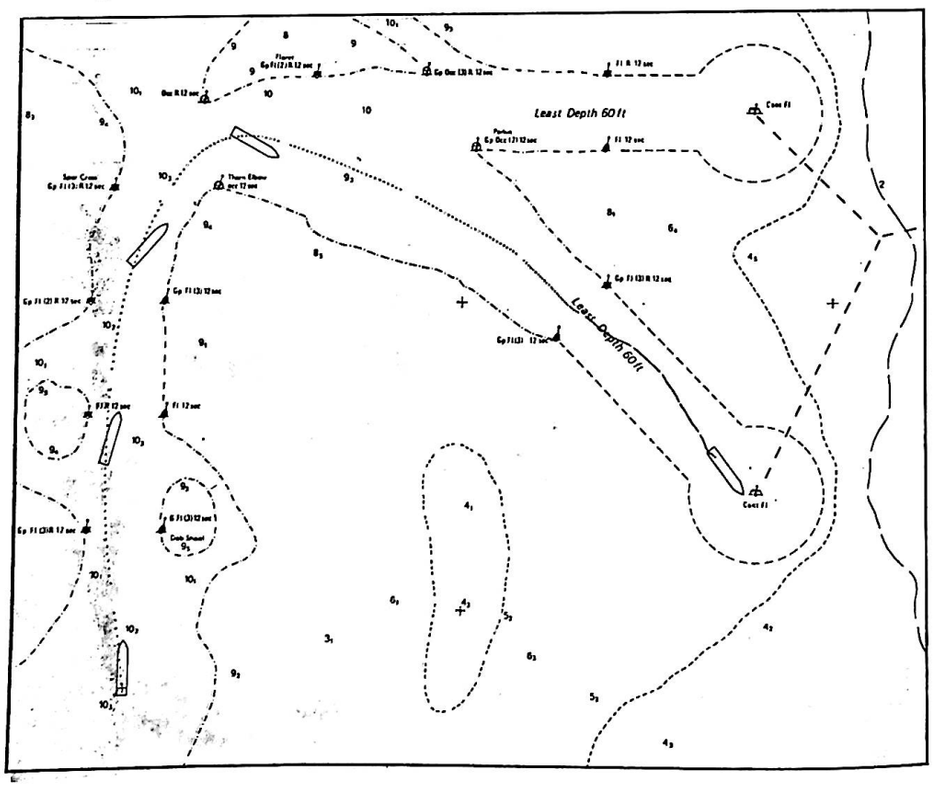
out by the National Physical Laboratory with a radio controlled model of a VLCC to determine manoeuvring characteristics in varying depths of water. After the analysis of these trials, it was possible to modify the ship response part of the simulator to ensure that the inter-relationship of rudder, rate of turn, drift angle, and speed were properly varied in accordance with the varying depths of water. At the same time, the earlier limited visual view was changed for a night-time view with the necessary degrees of freedom of movement; this view showed the lights of a buoyed channel, with the lights now moving in the correct manner as the vessel sailed up the channel. Four computer-controlled projectors were used to show four buoy lights at a time with appropriate flash sequences and colours. An unlimited succession of buoys could be shown but other ships' lights were not, at this stage, provided.

DTI arranged for a number of VLCC Masters and VLCC experienced Pilots to visit this facility and a first series of some 30 runs was carried out in varying depths of water. Automatic recordings were made and a typical run in shallow water is shown in Fig. 1. Quite a good run was made up the channel with a 7 ft under keel clearance. Automatic strip recordings were made of rpm, speed, rudder angle, rate of turn, drift angle and heading.

Despite the experimental and rather crude nature of the simulation facility, all the Masters and Pilots stated that they found the simulation realistic and acceptable. Two principal comments were of interest. One was that they found the runs rather too easy, secondly that the ship steered too well at speeds below three knots.

A second series of trials was arranged using the same ten Masters and Pilots and another 35 runs were carried out. In this series, the exercises were made more difficult, and some random sheer was introduced into the behaviour of the vessel at speeds below three knots.

Fig 1



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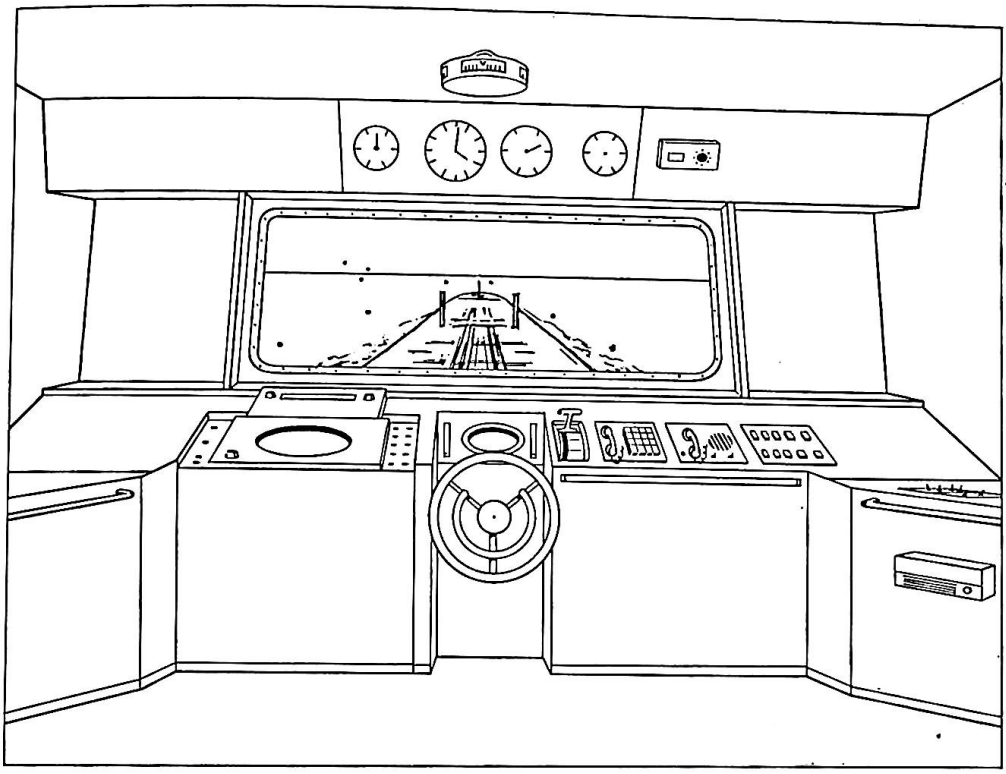


Fig 2

Runs of increasing difficulty were arranged, first carrying out a run with tidal stream present. Some runs were less successful and some minor incidents occurred. As a further difficulty some deliberate faults were introduced, such as steering or radar failures.

In the latter series of runs, all the Masters and Pilots stated that they found the trials much more difficult and far more realistic. It is beyond the time available for this paper to go into any detail of the results and it must suffice to say that some very useful lessons were learned and some very useful suggestions for minor improvements were made. Some of these improvements were incorporated during the trials, others were reserved for later work, but a firm principle was adopted of not introducing complications unless a clear mariner-felt need for them was established during the trials. This philosophy of simplicity has been adopted throughout the work and this experimental simulator has been used largely as a design tool for the engineered version. Most encouragingly, despite the highly experimental form of this facility, the night-time simulation was regarded as acceptable and useful.

Based on the outcome of this programme, the Department of Industry placed a contract with Decca Radar Limited to develop an engineered equipment suitable for training and research incorporating the lessons learned.

The Engineered Simulator

The engineered model of the simulator is being developed under contract from the Department of Industry for the Ship Division of the National Physical Laboratory. It is again a night-time simulation using computer controlled projectors for the visual scene. This technique, although not new, does not appear to have been generally considered but has the advantage of providing good realism without excessive cost.

In addition to the visual scene, which covers about 100°, a full radar presentation is provided of navigation marks, coastline and other ships; thus information is

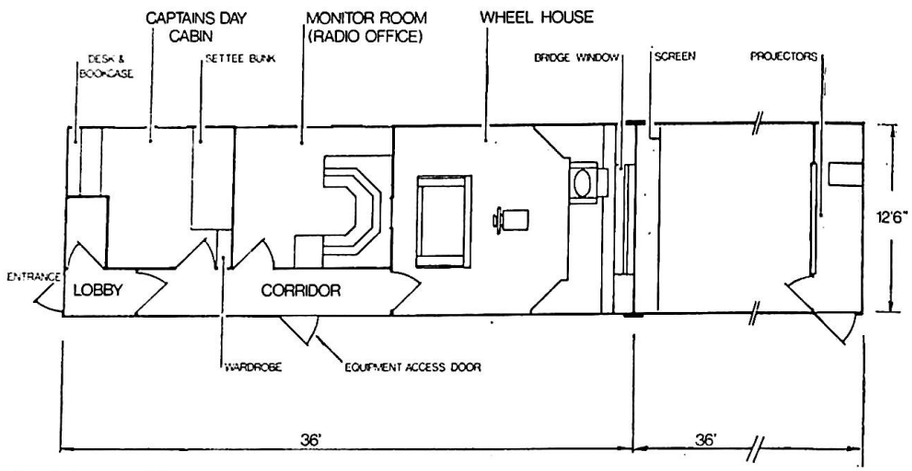


Fig 3 General layout

available on everything within the full 360° coverage.

The simulator has a wheelhouse, in the forward bulkhead of which is a bridge window through which can be seen the bow of own ship, its wash, navigation mark lights, other ships' navigation lights, horizon and stars. Up to 16 navigational lights can be shown at a time.

The wheelhouse is shown in Fig. 2. The bridge console contains the principal control and communications facilities: for example, wheel and autopilot, engine control, anti-collision radar, ships' telephone, radio communications and warning annunciators. The wheel and autopilot can be mounted either in the console or as a free standing unit in the centre of the wheelhouse. At the rear of the wheelhouse there is a chart table with navigational aids and visual instruments.

Mounted above the bridge window are such instruments as heading repeater, log, rate of turn indicator, engine rpm and clock. On the deck-head is a rudder indicator. Engine and propeller noises and vibration are generated, all varying with propeller rpm.

Vessels between 200 tonnes and 500,000 tonnes can be simulated with the vessel responding in proper manner to wheel and engine controls. Diesel or turbine engines can be simulated. The depth of water under the keel is also taken into account, as this has a considerable influence on the manoeuvring of a vessel.

The manoeuvring behaviour of the vessel is governed by a computer mathematical model developed jointly by the National Physical Laboratory Ship Division and by Decca, based largely on the earlier experimental model. The simulator can be programmed for artificial exercise areas or for real ones. The exercise area is held in the computer memory and can be changed in minutes by inserting a different magnetic tape cassette.

In order to make the simulator facility versatile and portable, and to save installation costs, it is constructed in two Portakabins. By this means the entire equipment suite may be commissioned before leaving the works without the need to separate the various sub-units for transit to destination. The layout is shown in Fig. 3.

The projector system is mounted in one of the Portakabins. The buoy lights and other visual images are projected onto a rear projection screen. The wheelhouse is in the other Portakabin. The simulator facility is approached through the door in the end of the building, and the first cabin reached is the "Captain's Day Cabin". This room is planned to allow its use as a small lecture room and to aid shipboard and night-time adaptation. Between this Office and the Wheelhouse, is a ship-like corridor and opening off this is a "Radio Office".

The "Radio Office" contains the bulk of the equipment associated with the simulator, ie computer, interfaces, control and monitor equipment, video map generator, etc. The Instructor (or Exercise Controller) also sits in this room. The control and monitor equipment is mounted in a desk top console. Communication with the computer is via a keyboard and a tabular display on which is presented formulated "pages" to assist in the system operation.

The monitor meters and other control services are on panels in front of the Instructor who can also see the chart plot of "own" and "other" ships. Course and speed controls for "other" ships allow the Instructor to intervene if he wishes. In addition, a communication terminal for both R/T and internal telephones is at this console. The finish and fittings of the interior of the building are such as to create the impression of being on board ship.

Coastlines

Honorary Medical Adviser

The Executive is particularly pleased to announce an appointment in a newly created honorary office, that of Medical Adviser to UKPA, for which Doctor Frank Samuel Preston has generously offered his services.

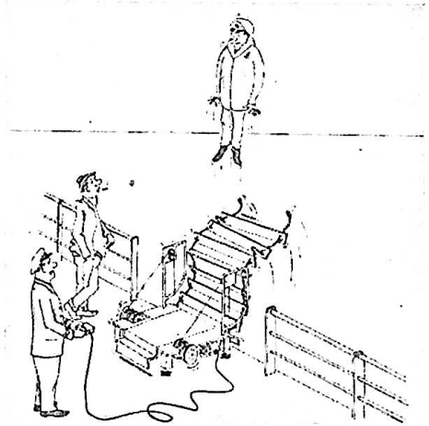
His interest in the health factors relating to maritime pilotage dated from 1965 when Peter Levack, alerted by a number of sudden deaths in quick succession in the London Channel Station, approached Dr Preston who was an acknowledged expert in the Human Factors Studies on airline pilots. Some two and a half years later when sufficient facts and figures had been collected concerning the working routine of maritime pilots it emerged that where one might have expected only two deaths from coronary disease there had been seven. Members will be aware of the important survey under Dr Harrington which was launched on the basis of this early assessment and opinion.

His career is unusually interesting. Before he became internationally recognised, a member of several occupational health committees and author of no less than 34 papers in this subject area, he was successively a Marine Engineering Officer, Royal Navy, during World War II and then re-entered the Royal Navy as a Surgeon after qualifying at Glasgow. He eventually retired from the RNR as Surgeon Captain in 1973 having, in his stride, been Honorary Physician to HM Queen Elizabeth II.

It was whilst in the Royal Navy that he carried out research on aviators' immersion suits, cold exposure and underwater psychology. In 1954 he joined BEA as Flight Surgeon and, since 1965, is the Principle Medical Officer (Air) in the amalgamated British Airways. In civil aviation he carried out a pilot workload study involving 1500 flying hours in a variety of aircraft. Other studies included sleep, Circadian rhythms, motion sickness, hypothemia, supersonic travel, radiation, drugs, shift working, measurement of pilot fatigue and the production of aviation medical manuals for aircrew. He is currently studying physiological arousal during automatic approaches and landings.

As a teacher he is in great demand for aircrew and for pre-aircrew training as well as by the Royal Institute of Public Health and Hygiene, the Order of St John and Post-Graduate Medical Schools.

We are most grateful to him for his continued interest in the health of maritime pilots. His counsel will be of immense help.



"Do you think this motor might be running too fast?"

Local Secretaries

Aberdeen	A. F. L. Esson	Aberdeen Harbour Pilots, North Pier, Aberdeen
Ardrossan	A. Caldwell	13 Chapelhill Mount, Ardrossan, Ayrshire
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