

THE DEVELOPMENT OF CLOUD TEN

The design criteria for this vessel were taken from a detailed study undertaken by the writer of the requirements and sea conditions of the Penzance / Isles of Scilly route. These criteria were then used by the marine architects as the model for a general design for a commercial high speed day ferry service in Atlantic waters

I was a Director and Manager for Isles of Scilly Steamship Company from 1976 to April 1992. This was the period when the travelling public came to expect higher standards of comfort and service. This was the time for example when British Rail developed and introduced the 125 train and the mark3 carriage, a great leap forward in speed comfort and service, still operating to-day on many long distance rail routes.

The problem we had with our conventional ship was the extended journey time, 2 hours 40 minutes each way, and sea sickness. Also in order to provide a day trip service, sailing times did not suit the needs of many long stay visitors. We departed Penzance at about 9.30 AM and left St Mary's at 4.30 PM. We had competition from the Helicopter service, journey time 20 minutes but very noisy and departing hourly throughout the day. Although our ship could carry 600 passengers, the numbers travelling was reducing and load factors rarely exceeded 60%

Encouraged by two of the long term older directors and having re organised the service to separate the freight service from the passengers, I began to research alternative craft for the passenger service. In particular the high speed designs that were being developed throughout the world and I made contact with relevant designers and shipbuilders. Some of the new ships gave very impressive performance, for example the OREGON built by the Kaverna yard in Sweden. She was built for the Honkong- Canton route and gave a very impressive display of 40 Knot travel on the Solent. But this was "Estuary" water; we needed a ship that could provide the same level of comfort in a North Atlantic seaway.

I talked to the Australian designer of the INCAT "Wave Piercer" ships, like the ones now operated by Condor on the Weymouth / Channel Islands service, and Brittany Ferries from Poole and Portsmouth, and at that time on the Sydney / Hobart run, but the minimum size for the design to work was too big for our route I visited Aluminium shipbuilders who were building the first wave piercer for Condor, again too big.

FBM Marine on the Isle of White built the "Patria" for service on the Funchal-PortoSanto Route. She was a "Semi Swath" and the distance and sea conditions were similar to ours. I visited their yard several times and travelled on her in service, and discussed UK certification and evacuation procedures and safe manning with the senior DfT surveyor at Southampton. The sea keeping was fairly good but she had no active ride control and with the slow recovery due to the small righting lever inherent in the SWATH design her ride was unsettling to the uninitiated. Also with fixed pitch propellers and the high minimum RPM inherent in high speed diesel power she was very difficult to manoeuvre. I identified a number of problems that needed to be addressed to get a design suitable for our route and the improvements needed to provide a service to the standards I felt were required for a prestige passenger service to the Islands.

I drew up a list of minimum parameters. I was helped in this task because detailed data about the wave conditions on our route was available from the then Institute of Oceanographic Science who had collated data from the wave recording device on the Seven Stones Light Ship. Here is the list.

In waves up to 3.5 metres Significant wave height and modal wave period up to 9.5 seconds.

Note significant wave height on the Isles of Scilly Route April to October is less than 3 metres on 95% of days and less than 2 metres on 89% of days.

Capacity: 350 passengers and baggage

Freight up to 5 tonnes

Speed 27 Knots

Range 200 NM

Sea keeping

Max pitch angle in head sea 0.5 degrees

Max Roll angle in beam sea 2.0 deg

Max heave acceleration in head sea at C of G, (RMS) 0.04G

(Note research shows that RMSG in excess of 0.10G will cause seasickness in 10 % of passengers after 1hour)

Max noise and vibration

In main cabin 69dB.

In upper deck cabin 66dB.

Comparative noise levels are:

125 train Mark 3 1st class coach 68 – 72 Db

Current ship Scillonian3 buffet 74 Db

S61 helicopter main cabin take off 96 Db, Taxi 100 Db, in flight 94 Db

(these levels of noise would be illegal in a work place environment)

Air conditioning

At least 3.5 complete air changes per hour

Seating Fully upholstered, all passenger space carpeted.

Class Lloyd's Register A1 High speed craft

Manoeuvrability for easy docking and undocking without assistance

Frames strengthened in way of berthing stresses

Max draft 3.5 metres

A Convenient fast baggage handling system to be provided.

The only ship form that could meet these parameters was a Small Waterplane Area Twin Hull (SWATH), and I made contact with Messrs Swath Ocean an American Company who had opened a UK marketing subsidiary. SWATH Ocean built a prototype vessel the Crebe for the Canadian Coastguard and I visited her twice, Once at St John's Newfoundland and again at Ramouskey on the St Lawrence estuary. I travelled on her for several days and one voyage was across the Grand Banks from St John's to Halifax Nova Scotia. There I met a marine engine specialist who pointed out the advantages of using small marine gas turbine engines which could be accommodated in the lower sponsons of the SWATH. This solved the problem of vibration from conventional diesels that would have had to be located in the "haunches" adjacent to the passenger accommodation with the attendant noise and vibration problem and also removes the need for "z" drive or carden shafts to take the drive from the diesels down through the struts to the propellers as on the "Patria". The

use of variable pitch propellers would provide the low thrust manoeuvring power need and also dispense with the need for Clutches. With a “combinator” control system very fine adjustment of power for manoeuvring would be possible

The Crebe proved that the SWATH hull form coupled with active ride control fins provided a level of ride comfort not seen before on any other hull design. On fisheries patrol she was able to stay at sea in storms, long after the fishing fleet had departed for shelter.

We had many meetings and I visited the SWATH marine design team at Blythe Bridges, and also Mc Neece the ship interior design experts where we evolved the spacious grouped “island” seating arrangements, getting away from the conventional in line commuter layout. It was agreed that the ship would be built in the UK by the McTay/ Miller yard at St Monance in Fyfe., this was a subsidiary of Molem Regional Construction who would guarantee the contract.. This firm built passenger ferries for Caledonian Mc Brain for the Scottish Islands services. SWATH Ocean offered a guarantee that the performance would be within an acceptable range of the parameters listed above, with a two year acceptance period from delivery date. The Paxman engine company offered free finance for two of the marine version of their latest development of their Valenta engine with a three for the price of two option to buy at end of year two. This was a superb engine as fitted to the Inter City 125 train locomotives with several million operating hours “in the bag”. A finance package for the whole project was arranged, which included retaining the Current Scillonian 3 ship for a minimum of two years. We were also guaranteed winter charter work for the SWATH as a side scan sonar platform for sea bed survey work.

Thus a full design was evolved, prices were agreed and a viable business plan prepared. For entirely separate reasons connected with preliminary negotiations I started on behalf of the Company with the liquidator of the bankrupt Helicopter company following the collapse of the Robert Maxwell Empire, I left the Company employment in April 1992. and the remaining directors cancelled all further discussions on the SWATH project.

However the SWATH Ocean Company were so confident in the design that we had evolved that they subsequently built a similar ship in Seattle using the Textron TF 40 gas turbine power and variable pitch propellers. She became the CLOUD X .and went into service on the West Palm Beach Florida – Bahamas route in 2004. This was a 3.5 hour voyage competing with air services and without an established customer base they did not achieve the desired load factors and she was laid up in November 2007. They did however achieve the performance criteria in sea conditions similar to ours.

This vessel is available for sale to –day in class with Lloyds Register and ready to go with a complete baggage handling system, comprehensive spares package, including spare power unit, and complete documentation to International voyage high speed code standards. The life saving equipment and evacuation procedures are all certified to IMO SOLAS standards for international voyages. The owner is prepared to offer a charter deal with built in option to buy so that the vessel can prove herself on the route before entering into any long term commitment. Purchase price is in the region

of £7million including the spares package etc.

The quick journey time and comfortable ride will enable an imaginative sailing programme, with timings to suit the needs of both day trip and long stay customers, for example:

| | | | |
|-------------|--------|---------------|-------|
| Dept Pz | 9.00Am | Arrive Scilly | 10.35 |
| Dept Scilly | 11.30 | Arrive PZ | 13.05 |
| Dept Pz | 14.00 | Arrive Scilly | 15.35 |
| Dept Scilly | 16.30 | Arrive Pz | 18.05 |

Evening Coastal cruise to Lands end

Or Dept Scilly 07.30 Arrive Pz 09.05 (to connect with long distance train

departures)

| | | | |
|---------|-------|---------------|-------------------|
| Dept Pz | 10.30 | Arrive Scilly | 12.05 (day trips) |
|---------|-------|---------------|-------------------|

Afternoon cruise around the Islands

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|-------------|-------|-----------|-------|
| Dept Scilly | 17.00 | Arrive Pz | 18.35 |
|-------------|-------|-----------|-------|

| | | | |
|---------|-------|---------------|---|
| Dept Pz | 19.30 | Arrive Scilly | 21.05 (Picking up long distance train arrivals) |
|---------|-------|---------------|---|

NOTES ON SOME QUESTIONS RECENTLY RAISED BY THE ROUTE PARTNERSHIP Etc.

The vessel is built from aluminium. Some islanders have queried the integrity of this material. Marine grade aluminium is more durable than steel if properly looked after. A large part of the QE2 is made of aluminium as was the Liner United States and nearly all the modern fast ferries throughout the world. The Cloud X designers used "Finite Element analysis" when specifying the structural details. This identifies the stress points at the design stage and appropriate stiffening specified.

Similarly the ship's frames are built to withstand berthing stresses when using floating yokahama type fenders

A county Councillor has queried the vessel's insurability. There is no doubt about the insurability of the SWATH she is already insured with a reputable marine insurance mutual.

An Islander has queried low tide operations. In fact there is no need for the vessel to take the ground; all that is needed is a timetable that avoids berthing at low water springs. Use of the available funding to provide sensible dredging and monitoring of the berths at both ends of the route would enable an improved sailing schedule.

The use of electric actuators for the ride control has been queried, as compared with a hydraulic system. In service it was found that the electric system was equally reliable and in fact responded faster to control inputs and would normally settle to a passive state with a bow down angle on the front fins of about 1 degree, the vessel requiring only very small ride control inputs to remain stable in a seaway.

The passenger accommodation is arranged in four saloons on two decks with ample catering facilities, and seating spaced suitable for an at seat service, there is an outside

promenade deck aft suitable for “cruise chair seating” in fine weather, and there are large observation windows all round. The main deck after saloon at present a “gaming zone” is suitable for fitting out as a “quiet area” with say curtained off banquettes etc. or maybe as a prestige Club Class venue, or just included as standard seating, or children’s / family room.



Cloud X at Sea



Combinator Control Panel



Cloud x lying alongside the berth



Main deck seating

She is available for purchase now at a price in the region of £7 Million fully equipped and with a comprehensive inventory of spares, including spare zero houred engine.

The vessel was designed in the UK to international standards and built in America to Lloyds register classification. She is certified to carry 365 passengers with baggage and cargo She has a twin hull with Beam 60 feet and length 123 feet, and is certified to operate in significant wave heights of up to 4 metres, well within the conditions met on the Isles of Scilly route in the months March to October, except in extreme weather when passengers are best not carried in any case.

The operating speed is 25/26 Knots, 27 maximum, powered by two Textron / Lycoming marine engines burning normal marine diesel fuel. Twin variable pitch, reversible propellers provide great manoeuvrability when docking/ undocking thus reducing the voyage time quay to quay to well under 100 minutes..

Passengers' luggage is rapidly loaded and unloaded by means of baggage trolleys and the ship's beaminess and short length means that she takes up less pier space than a conventional design of equivalent capacity, and hence can be conveniently accommodated at Penzance and importantly at St. Mary's quay where longer vessels can seriously inconvenience the busy passenger launch movements.

The interior layout is designed to provide a tranquil friendly environment for passengers. There is spacious accommodation divided into four separate lounges, two on the upper deck and two on the main deck. There are large observation windows all round, and an open deck observation area sheltered from wind and spray.

The lounges are carpeted and the seating is fully upholstered and comfortable.

Access for foot passengers is via conventional gangways through entry doors arranged to suit the quay heights at both ends of the route at all local tidal conditions.

Many potential passengers are deterred from travelling by sea to The Islands because of the high incidence of sea sickness. This is caused by repeated vertical accelerations above a certain threshold, which in turn are caused by the heave and pitch of the vessel. This adverse effect is enhanced on this particular route by the relatively long distance between the waves which occur on this part of the North Atlantic. The effect can be reduced by the use of stabilisers but still presents a significant problem on a conventional monohull design as proposed by Cornwall Council (Incidentally the current Scillonian is fitted with stabilisers of an advanced design but even so she is affectionately known by many Penzance guest house proprietors as “the stomach pump” or “the Sickonion”).

The vessel proposed here overcomes all these difficulties with a twin hull layout with particular attention to the detail of displacement at the water line. In simple terms a rising wave does little to cause the ship to heave or pitch, and the effect is further reduced by a sophisticated and well tried system of “active ride control” which further compensates for the effect of the waves. This reduces the heave and pitch in the prevailing conditions to well below the threshold where nausea occurs. A further reduction in sea sickness is achieved by sensitive attention to the ambience of the accommodation, temperature, noise, vibration and decor coupled with a substantial reduction in journey time.

The speed of this vessel, reducing the journey time to below 100 minutes, further enhances the attraction of the journey, and also enables diversion from the direct route to avoid the incidence of adverse wave conditions on parts of the direct route in certain states of tide and weather. For example, by going further North advantage can be taken of the shelter provided by the islands from a South Westerly running swell. This was proved in about 1990 when the writer chartered the small but fast little passenger vessel “Oldenburg” which normally runs from Ilfracombe to Lundy Island, as a replacement when Scillonian 3 was out of service for repairs. To-day, modern electronic communication would enable the crew to receive a visual presentation of the predicted sea state and wave direction before embarking on the voyage and to choose the route appropriately for maximum passenger comfort.

In general terms the cost of operating a passenger ship is proportional to its size and maximum carrying capacity. (This applies to most transport systems, eg buses, trains, aeroplanes and helicopters). The ratio between the maximum capacity and the actual numbers carried is described as the “load factor”. The higher the load factor achieved, the better the return on investment. The existing ship has a capacity of up to 600 passengers. Even when the ship was planned in the mid 1970's it was perceived as being too big for the route, and over the years the load factor has gradually fallen away, even in the late 1980's, the last “hey day” period for day excursions the load factor was rarely over 45% for the summer season and always less than 5% in the

winter. With the smaller ship described here, carrying up to 350 passengers, the load factor will be much higher and the return on investment considerably improved with more passengers carried overall by making more round trips when needed..

A feature of passenger traffic on this route is that peak demand is concentrated in no more than six weeks, late July to end of August. With a smaller faster ship these peaks are easily met by operating additional voyages. As explained in the management summary, two or more return voyages per day will enable the service to fit in with the different travelling requirements of day and long stay visitors. By offering a timetable that meets customer convenience greater numbers will be encouraged to use the service. Coupled with the improved terminal facilities at Penzance specified at section 5 this proposal will provide a modern fast convenient passenger service to and from the islands , suitable for 21st Century travellers at a minimum capital outlay for the Local Authorities, and the service operator, and will dovetail neatly with the excellent public transport infrastructure already provided at Penzance

A major factor to be taken into account when planning for the next 30 years is that motoring costs will be much higher and this means that visitors on holiday will be less mobile, than previously. To encourage day trip traffic this smaller but much faster ship will be able to call and pick up and set down passengers at other Cornish ports. For example Newquay, Padstow, Falmouth, Fowey, Mevagissey, Par and even Truro. Thus not only enhancing the potential traffic to the Islands but also providing additional interest and attraction for visitors to Cornwall.

Penzance has an excellent train service; one can travel to or from any part of mainland Britain within the day. Most long distance arrivals are between 6.30 PM and 8.00 PM and long distance departures are before 10.00AM. At present the ship service can not dovetail with trains for long stay visitors. The flexibility and speed of the passenger only vessel proposed here will enable voyages to be scheduled to provide an integrated same day service for visitors arriving and leaving by train, for customers to catch the Cross Country and London services. Integrated ticketing could then provide combined rail and sea fares to the Islands from all over the UK, an excellent and unique marketing tool to encourage new long stay visitors to the Islands.

The fast passenger only vessel proposed here will not be required to spend time at the quays loading and discharging general cargo, and hence there will be more time available to spend at sea. This means that as well as offering the enhanced service from mainland ports as described above, on certain days, the vessel will be able to offer deep sea scenic trips around the islands, providing an additional attraction for day visitors and giving visitors by air a chance to sample the excellent facilities and sea keeping offered by the new ship and perhaps choose to travel by sea on their next visit.

The speed and sea keeping features of this vessel will enable much greater flexibility to enable additional voyages at peak demand times and when relief trips are required when air services are grounded

TRYTHALL SHIPPING, J E C CARTWRIGHT MAY 2009