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Viability Analysis of Hovercrafts as Passenger and Freight Transporters. An Updated Overview

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ABSTRACT

The present paper is going to analyze the opportunity to do another view to the viability of commercial hovercrafts nowadays. The hovercrafts were removed from general passenger traffic in Europe around fifteen years ago (Last trip of ACV 'Princess Margaret' took place in The English Channel on Sunday, 1st Oct. 2000). It is true that there are several examples of small models that are linking different commercial or touristic destinations, that's the case of the two old AP1-88/100 passenger hovercrafts running the Solent and joining in a daily basis South sea (Portsmouth) with Ryde (Isle of Wight).

The oil prices together with its high maintenance costs were one of the biggest reasons that condemned the hovercrafts in the past, but even existing today the same conditionings, renewable or new energy alternatives along with new designs being carried out may hopefully reopen the commercial market for them in next years.

1. Introduction

On this paper, the author is going to analyse the present status worldwide of commercial hovercrafts only from the point of view of its economic sustainability trying to conclude in the most pragmatic way possible about where, when and how they could become successful in comparison with other kind of advanced marine vehicles dedicated to the passenger transportation.

For 50 years commercial and military operations have utilized hovercraft to travel over surfaces that prove difficult for other vehicles. In terms of economic feasibility, the hovercraft as a means of transport is similar to other machines that operate on steel rail, air and sea. Hovercraft ferry services have existed in the states of Victoria and Queensland and in the northern territory of Australia, and in Sweden, Japan, Hong Kong, China, England, France, Canada and other countries, but only a few remain. The oldest remaining service today is in the United Kingdom across to the Isle of Wight[2].

History indicates that public ferry operations of any type require public subsidies. When subsidies dry up, so does the ferry service. To survive, a ferry service must have some form of subsidy along with one other key ingredient: The service must offer a huge advantage to the traveller[3].

The question is that hovercrafts offer such huge advantage to commuters, but even so, in spite of the government subsidies, they still have been unable to compete with the economic sustainability provided by fast catamarans, trimarans and monohulls involved in the same route.

Meteorological restrictions (when crossing the English Channel and seas reached more than 6-8 feet, the service was suspended or got into difficulties when winds were topping the 30 knots), along with high fuel and maintenance costs made the economics of these hovercraft ferries increasingly uncertain.

In recent years, numerous cities have explored the feasibility of commercial hovercraft ferry services. A few have succeeded for a short time, but eventually failed, others, they have not even started.

Should we become enthusiastic about its future as passenger

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[2]http://www.hovertravel.co.uk/about-hovertravel.php, access date 19/05/2015.

[3]'Hovercraft in Commercial Applications'. World Hovercraft Organization, July 2008. http://worldhovercraft.org/insider/july08.htm

ferries? Perhaps will have to await until next year 2016 when the new Griffon Hoverwork project 'The 12000 TD hovercraft'[4] will start running to give you a much more accurate answer to this question.

2. The Economic Viability of an Hovercraft as a Ferry

It's a complex and not easy issue touching the economic factor when studding the economic sustainability of a shipping company based on hovercrafts as transportation means.

Up to now, not a single company based on the exploitation of ACVs (Air Cushion Vehicles) has commercially succeeded using these machines as unique transport mean. Only Hovertravel, the Solent operator since 1965[5], is running nowadays a hovercraft service as ferry operator having recently put on sale its biggest & newest hovercraft 'Solent Express' to overcome the high exploitation costs it has to afford. The company, now linked to the Bland Group, had continuously ploughed money back into its operation, first funding its new terminal at Ryde, then in 2007 acquiring from Hoverwork the new BHT130 'Solent Express', overhauling the two AP1-88 during 2009/10, upgrading its work shop to accommodate the BHT 130 & finally ordering the two new Griffon 12000 TD hovercrafts expected to get in service early in 2016. Cost wise, have to highlight that around the 38% of Hovertravel total exploitation burden are maintenance & fuel costs (21 % & 17 % respectively)[6] This 38 % in maintenance & bunkering costs is indeed a high burden to overcome compared with other kind of high speed vehicles, like catamarans, having a significant impact on their economic viability and pricing competitiveness.

Despite the advances in building high-speed catamarans, the hovercraft is still the "fastest ship" in the world. Onboard them, Channel crossing generally took 30 minute crossing time, but could be as quick as 22 minutes with SRN.4 Princess Margaret or Princess Anne. On traditional ferries, crossing times were normally 100 minutes. No other passenger marine vehicles have improved this record up to now. Said above, it is quite hard having to admit that the fastest advanced maritime vehicle invented by Sir Christopher Cockerell in 1956 has not achieved the expected economics return in those shipping companies that bet on it. As already said, excepting Hovertravel, we cannot see nowadays any other commercial hovercraft operator.

Later on, The 'Suna X', a 89-foot-long hovercraft owned by the Aleutians East Borough, connected the town of King Cove and its airport. The Borough[7] acquired the vessel for service between King Cove and Cold Bay in 2007, but it proved trouble-prone. A 2008 press release from the Borough said, 'Mechanical problems, delays in getting replacement parts from the United Kingdom and poor weather have combined to keep the hovercraft out of service much more than previously anticipated[8]'.The Aleutians East Borough purchased the 'Suna X', a $9 million BHT-130 hovercraft using a $37.5 million earmark from the late Sen. Ted Stevens (R-Alaska). While the vessel successfully evacuated dozens of medical patients out of King Cove from 2007 to 2010, local officials said it was too costly – it lost about $1 million annually, they said – and it reportedly could not operate in waves above 6 feet or winds above 30 miles per hour, which was about 30 percent of the time[9]. Now seems that a the Aleutians East Borough, to recoup their high investment, entered into a Purchase/Sale Agreement with Cruz Marine, LLC for the used vessel Suna X, including spare parts and tools in the amount of $4,500,000[10].

3. Analysis. What is Going to Happen with these Advanced Marine Vehicles?

It seems to be that the new Griffon 12000TD hovercraft, now under construction, is the only solid project that could ensure a challenging future for commercials ACVs, [11].

Up to now commercial hovercrafts topping the 80 people in capacity have been using diesel engines to run, two has been dedicated to generate a plenum chamber underneath and the other two to drive two big propellers for thrust. In that scenario, to feed up these four engines 4.220 total horsepower for the BHT-130 'Solent Express' implies a marine diesel consumption of +/- 600 liters/hour. Consumption drops for AP1-88 series down to 300 liters/hour, still higher than similar passenger capacity catamarans type 'River Runner 150 MKII' mounting two Carterpillar 3406E engines burning around 270 liters/hour with a 150 passenger capacity[12].

But fuel consumption perhaps is the minor constrain compared with the maintenance & repair costs a company should get through when exploiting ACVs. Monohulls & catamaran maintenance costs have to be focused mainly on their two main engines and underwater body of the ship. For those ships, a well maintained hull will last for years, but we cannot say the same for the skirt & fingers of hovercrafts. Wear and tear has a direct and negative incidence on the rubber material destroying the hovercraft fingers every 800/1000 hours of service being the finger replacement cost about 160 pounds per unit[13].

In a port to port service based on hovercrafts, a repair shop close to the landing pad at one of the ports is fundamental for surveillance, maintenance & repair activities to keep the four engines and more than 100 fingers always in sound conditions. But what is more, their acquisition costs are also much

[4] http://www.bbc.com/news/uk-england-hampshire-30209360, access date 19/05/2015.

[5] http://www.hovertravel.co.uk/about-hovertravel.php, access date 19/05/2015

[6] Isle of Wight Council. Directorate of Corporate Services and Monitoring Officer. Policy Commission Blue Paper. Davina Fiore. Cross Solent Travel Costs. https://www.iwight.com/council/committees/Policy%20Commission%20for%20Business%20and%20Infrastructure /29-4-09/Paper%20B.pdf

[7] http://www.aleutianseast.org/, access date 19/05/2015

[8] The Anchorage daily news. http://www.mcclatchydc.com/2012/11/05/173571/air-service-to-alaskan-island.html.

[9] http://www.eenews.net/stories/1059997801, access date 30/04/15.

[10] http://www.aleutianseast.org/vertical/sites/%7BEBDABE05-9D39-4ED4-98D4-908383A7714A%7D/uploads/JANUARY_8_2015_SPECIAL_ASSEMBLY_MEETING.pdf

[11] http://www.griffonhoverwork.com/news/latest-news/hovertravel.aspx

[12] https://marine.cat.com/cat-3406E, access date 17/04/2015.

[13] Author interview in May 2009 with Hovertravel previous Chief Operator, Health & Safety Manager Capt. Barrie Jehan.

Figure 1: The Suna X making way in aleutian Islands.

Source: Marinetraffic.com

Figure 2: Damaged fingers and scartched skirt of an hovercraft.

Source: http://www.sestran.gov.uk/files/BACKGROUND%20REPORT%200054-DV01356-DVR-02%20Hovercraft%20Trial%20Data%20Collation.pdf

higher than a similar passenger capacity catamaran or monohull, (Suna-X- acquisition cost was 9 million of USD, the BHT 130 Solent Express was established in 6 million of pounds).

Although the most discouraging facts are that none of the later study projects studying the implementation of a regular line service based on them has finally been settled.

Neither trials carried out between Portobello and Kircaldy in year 2008 by Stagecoach[14] to launch a hovercraft service across the Firth of Forth by summer 2009 nor those studies ordered by San Francisco Bay Area Water Emergency Transportation Authority (WETA) carried out by URS Corporation in 2011, achieved the implementation of a new hovercraft regular passenger service in their respective areas[15].

The first Scottish project was rejected by Edinburgh City Council basing their decision on 'the visual impact of the proposed ramp, noise and transport concerns[16]'. The San Francisco Bay project was finally discarded by San Francisco Bay Area Water Emergency Transportation Authority arguing that a hovercraft new service would not be able to take the advantage of existing ferry infrastructure in San Francisco or planned and existing maintenance facilities, which means that a separate parallel ferry infrastructure network would need to be built. The cost of building a second ferry network, would likely far outweigh the potential savings in dredging realize by a hovercraft. In addition, the noise from hovercraft vehicles can be significant[17].

Nowadays only The Hoverlink project aims to have terminals serving the Wirral area, North Wales, Blackpool and Liverpool in action by the end of 2015 but there are no news about this new trial and a complete silence persists.

Till now, Hoverwork used to have 4 basic questions to assess the suitability of a route for hovercraft[18]. These 4 simple questions are:

1. Can the proposed Hovercraft route be easily and efficiently operated by a displacement vessel, high speed or otherwise?

2. Is the proposed operation in an open ocean or long sea route where the sea state is likely to exceed 1m much of the time?

3. Is there sufficient revenue in the project to support a fully amphibious hovercraft? As a general rule the operational costs of a hovercraft will be slightly higher than those of a high speed boat of comparable capacity.

4. If the proposed route was in direct competition with a road would there be very considerable time saving to be made by using a hovercraft?

If the answers are 'No' to the first two and 'Yes' to the last two, then there appears to be considerable benefits in using amphibious hovercraft. A simple checklist which seems to address the salient points.

To minimize the impact of the third question, think that the new Griffon 12000 TD hovercraft project (see below picture) has much to say, especially regarding to the maintenance and running costs as with only its two engines the fuel consumptions will drop (2x1000 HP Diesel Man engines)[19], also both external and internal noise levels will be substantially undercut with the use of bigger ducted thrust propellers which together with a much quick access to the passenger cabin via the two forward ramps will convert it in a much more handy, economic, environmental & social sustainable advanced marine vehicle.

Meanwhile, industry experts agree that there exist three fundamental requirements for a hovercraft ferry operation to succeed:

a) The route to be traveled by the hovercraft is one in which no other technology would work.

b) For public transport systems to be successful, some form of subsidy is necessary and cooperative government support is essential.

c) Experienced hovercraft ferry management staff is essential to minimize costs and boost incomes through the use of new technologies in the company management.

I think the above mentioned are the 'k' points to run a new service based on these vehicles without endangering its economic viability.

4. Conclusion

One will have to wait for the next two years the results of the vital investment that Hovertravel is carrying out on the two new hovercrafts being built at Griffon Hoverwork factory in Southampton to determine the future of commercial hovercrafts as a viable alternative to the current catamarans and monohulls that nowadays monopolize the passenger sea traffic for very short sea distances. Just then we will be in a position to confirm the revival of the hovercraft as a competitive and sustainable passenger mean of transport for very short sea routes.

[14]Cross Forth Passenger Ferry Study Stagecoach Hovercraft Trial Data Collation 19 October 2007 Report no: RT/DV01356/16/02. http://www.sestran.gov.uk/files/BACKGROUND%20REPORT%200054-DV01356- DVR-02%20Hovercraft%20Trial%20Data%20Collation.pdf

[15]Final Hovercraft Feasibility Study. Prepared for Water Emergency Transportation Authority. Prepared by URS Corporation Post Montgomery Center. One Montgomery Street, Suite 900. San Francisco, CA 94104-4538. April 2011,http://sanfranciscobayferry.com/sites/default/files/weta/meetings/Agendas/2011/060211.pdf

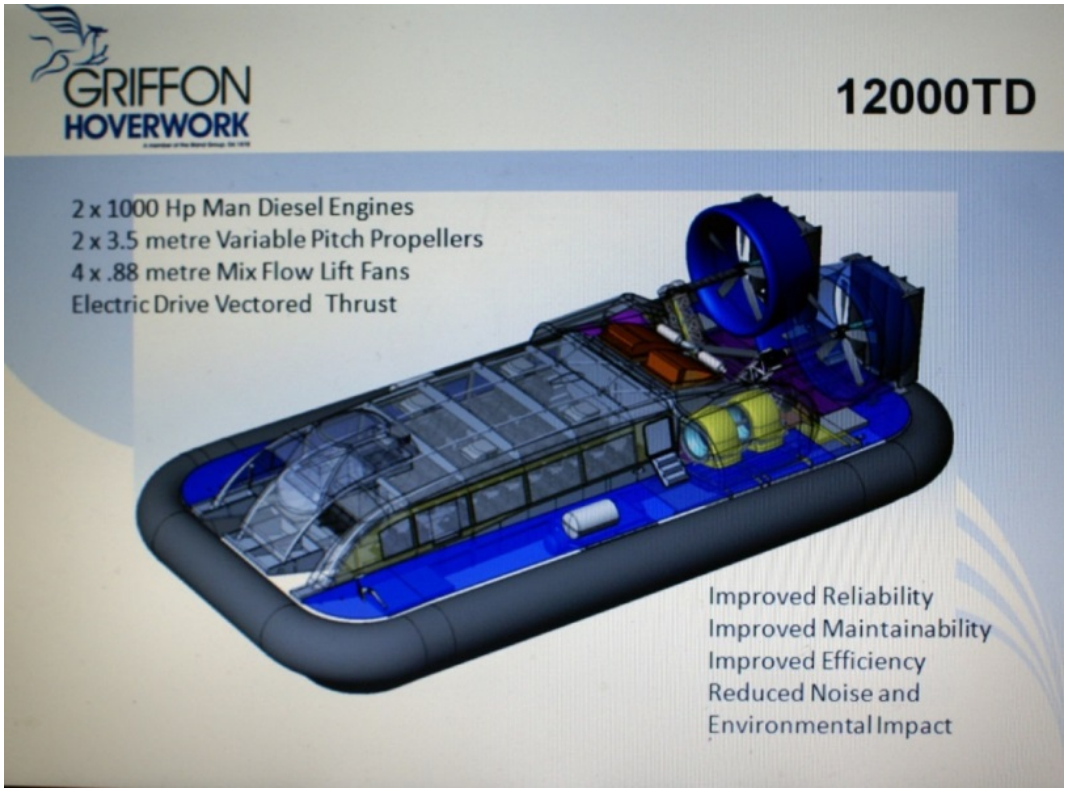
[16]http://www.bbc.com/news/uk-scotland-edinburgh-east-fife-16113262, access date 10/04/2015.

[17]Financial Feasibility of Contra Costa Ferry Service. Draft Final Report May 29, 2014. http://www.ccta.net/_resources/detail/45/1

[18]http://www.bartiesworld.co.uk/hovercraft/thestory.htm, access date 01/05/2015.

[19]http://onthewight.com/2014/11/27/everything-we-learnt-about-the-upcoming-new-hovercraft-podcast-and-gallery/, access date 01/05/2015.

Figure 3: The new Griffon Hoverwork project. The 12000 TD passenger hovercraft.



Source: Griffon Hoverwork.

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