

# Potential possibilities of application of new types of high-speed vessels in the tourist sphere of the Black Sea area

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**Abstract.** The paper deals with some issues related to the study of the potential use of new types of high-speed passenger ships for the organization of maritime passenger traffic between the ports of the Black Sea. In addition, a project was proposed for organizing excursion passenger lines between the Black Sea and Mediterranean ports, as well as tours along the coastline. Recently, special attention has been paid to the development of sea tourism in the Black Sea. However, for the organization of this type of tourist activity, it is important to understand the possibilities of using special types of marine passenger ships developed by domestic designers. The implementation of design ideas in the very near future will make it possible to organize highly efficient maritime liner and cruise communications on the Black Sea.

## 1 Introduction

There is a large untapped tourist potential in the Black Sea. Its development is hampered, in particular, by an underdeveloped transport infrastructure. The organization of excursion tours along the sea coasts around the Black sea is a tempting prospect for the cost resorts and recreational complexes. Mainly ground modes of transport are used for these purposes: cars, buses; less often - water vehicles - boats, yachts, etc. At the same time, considerable time is spent on transportation and, as a result, excursions over short distances are mainly in demand. Helicopter and light aircraft excursions are expensive activities that also provide only a remote survey of points of interest during the flight. These problems can be solved through the use of new vehicles - ekranoplans (dynamic hovercraft using the screen effect).

## 2 Main Part

In the "Central Design Bureau (TsKB) for SPK named after R. E. Alekseev" in Nizhny Novgorod six decades ago, for the first time in the world, high-speed passenger ships of a new generation, which to this day have no analogues, were created. The Central Design

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Bureau, which was and remains the world leader in its field, managed to maintain a unique potential in the field of R&D and production of high-speed hydrofoils, hovercraft, ekranoplans. To date, the company is able to offer new types of maritime transport, including the Black Sea. Today, interested industries are uniting the efforts of domestic enterprises to create a reliable water transport system. In November 2014, the concept of the development of a high-speed fleet was presented to the President of the Russian Federation during his trip to the Far East (Figure 1).



**Fig. 1.** Transatlantic yacht - ekranoplan (project).

The enterprise, in fact, revives the high-speed fleet, believing that there is simply no alternative to high-speed vessels in many regions of the planet. Plus, ships should be able to navigate in shallow water and off unequipped shores. The high-speed fleet, in addition, has a high export potential in such areas as Southeast Asia, Malaysia, Indonesia, Africa, and South America.

Undoubtedly, the use of a high-speed fleet in the Black Sea would ensure high-speed and uninterrupted communication between Black Sea and Mediterranean for excursions around the sea's coasts.

To provide excursions along the Caucasian coast, both relatively small ekranoplans of the A-005-514 - Volga 2M type, and high-speed hydrofoils can be used (Figure 2).



**Fig. 2.** Ekranoplan of the A-005-514 - Volga 2M type.

The characteristics of the marine multi-purpose cargo-passenger ekranoplan type "B" A-005-514 - Volga 2M are presented in table 1.

**Table 1.** Technical characteristics of the ekranoplan "Volga 2M".

Characteristics	A-005-514A Volga 2M
Overall length. m	11.6
Overall width.m	11.6
Overall height. m	3.65
Draft overall. m	0.3
Takeoff weight. t	3.1
Flight speed on the screen. km/h up to	165
Passenger capacity. pers.	8
Crew size. pers.	1
Wave height during takeoff. m	0.5
Wave height during flight on the screen. m	0.5
Landing. m	1.25
Flight range on the screen. km	500
Carrying capacity. t.	0.9

The ekranoplan of this type is designed to transport passengers during daylight hours and at low speed. It can also be used in coastal navigation.

Also, for excursions around of the Black Sea coast, hydrofoils of the Kometa type of the 120 M series (Figure 3) and high-speed catamarans (Figure 4) can be used.



**Fig. 3.** Hydrofoils of the Kometa type of the 120 M series.



**Fig. 4.** High-speed catamaran "Crimean arrow".

Their technical characteristics are presented in table 2.

**Table 2.** Technical characteristics of vessels.

Characteristics	Catamaran "Crimean arrow"	"Comet" 120 M
Overall length. m	42.5	35.2
Overall width. m	10.0	10.3
Draft. m	1.7	3.5
Speed. km/h	54	63
Passenger capacity. pers	298	120
Crew. persons	5	5
Wave limitation. points	3.0	3.0
Cruising range. km	540	360

For organizing ekranoplan excursions around Black Sea coast, for example, the ideas of the <Black Sea Around the World= by Pavlatos V.P., the chairman of the board of the Black Sea branch of the Union of Cinematographers, are interesting. In addition, sightseeing tours along the one of the resort's coast can be thematic:

1. "Cinema in a striped vest", with a visit to the places where a large number of popular films were shot on and under water off the coast of the one of resort of the northern part of the Black Sea.

2. Tour "Wine Sea", with a visit to the famous wine-making centers, such as Abrau-Durso (Figure5), Koktebel, Novy Svet, "Magarach" and "Massandra", Inkerman and "Zolotaya Balka", etc.).



**Fig. 5.** Abrau-Durso winery.

3. Transfer to the places of the most interesting northern Black Sea shelf <Divingsafari= tour with dives (Kara-Dag, Novyi Svet, Ayu-Dag, Laspi, near capes Aya, Fiolent, Tarkhankut, etc.).

4. Tour "Figuresque palaces", with a visit to the palace of Kuznetsov, Vorontsov, Yusupov, Livadia, Massandra palaces, the palace of Princess Gagarina and parks.

5. "Eastern Tour" with a transfer to Kerch along the Azov coast of the Crimean Peninsula - Cape Tarkhan - Cape Zyuk - Marine Corps Bay (parking near the village of Kurortnoye) and further to the Kazantip Peninsula and the 113-kilometer Arabat Spit.

6. Tour "Fabulous" will be good for those who do not like to leave their active child alone. The tour involves a transfer to the Yalta Zoo, as well as "Aquatoria" - the theater of marine animals. Or, to the Taigan safari park with a subsequent visit.

7. Tour "At the height" involves a fascinating transfer to the peaks of the South Coast - Mount Ai-Petri (1234 m above sea level).

8. "Sights of Gurzuf": Chaliapin's grotto, the twin rocks of Adalary, Ayu-Dag, the international children's center "Artek" and much more.

9. "Parks of the South Coast": transfer to Forosky, Alupka parks, Nikitsky Botanical Gardens, Aivazovsky Park, etc.

10. <A rich trip to Simeiz= climbing the Diva rock, transfer to Mount Koshka, visiting the Crimean Astrophysical Observatory, the <Blue Bay= water park.

Tours and objects of visit can be supplemented and changed taking into account the individual wishes of customers. One of the most important areas of work is the expansion of the use of ekranoplans. At present, work has already been launched to prepare for the serial construction of ekranoplans for walking and tourism.

Excursions along the perimeter of the Black Sea coast should be carried out along the sea corridors allocated in advance and agreed both in time and in place. The maximum speed can be accelerated in the corridor away from the coast, and the sightseeing tour of the most beautiful places on the coast should take place at low speed.

For communication between the Caucasian coast of Russia and others Black Sea regions, high-speed ekranoplans (speed from 300 to 610 km per hour) of a larger capacity (from 50 to 550) can be used. It will allow traveling from Sochi to Yalta in 2-3 hours. For comparison, by plane it will take at least 6 hours (including transfer to the airport). A-050-

538 and A-300-538(Figure 6) can be attributed to such ekranoplans, their characteristics are presented in table 3.

**Table 3.** Technical characteristics of ekranoplans A-050-538 and A-300-538.

Characteristics	A-050-538	A-300-538
Overall length. m	34.2	72.1
Overall width. m	26.5	56.2
Overall height. m	9.88	18.7
Draft. m no more	0.93	1.97
Takeoff weight. t	38.0	70
Flight speed. km/h	310 / 350	610
Passenger capacity. pers. to	80	550
Crew. pers.	4	8
Wave height during takeoff. m	1.6	2.5
Wave height during flight. m	3.5	3.5
Wave height at landing. m	3.5	6.0
Flight range on the screen. km to	1200	3000



**Fig. 6.** Ekranoplan of the A-300-538 type.

### 3 Conclusions

Despite the fact that ekranoplans of the new generation currently exist only as scale models, they can be safely called a very promising direction for the development of domestic passenger shipbuilding. Considering the great interest of foreign operators in these developments, we have the right to predict the appearance of these modern high-speed vessels on domestic Black Sea passenger lines in the near future.

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