



A brief history of wing-in-ground effect technology

Germany has of course been instrumental in the development of ekranoplan technology, mainly due to the advancements made in the field of aerohydrodynamics by Alexander Lippisch, whom many consider the godfather of ground effect technology, but it was the Russian engineer Rostislav Alexeiev and the Soviet Union's commitment to the concept that has perhaps allowed the ekranoplan to be still relevant in the 21st century.

In 1958, Alexeiev headed work on creating a prototype for the Soviet Navy. Three years later, the first self-propelled ekranoplan model SM-1, capable of speeds up to 200km/h, was designed and built.

In 1962 the technique of air cushion inflation using engines under the lifting surface was implemented in the self-propelled model SM-2. The SM-2, followed by the SM-2P7, SM-3 and -4, -5 and -8, became the prototype configurations for the first Russian ekranoplans. These prototypes eventually led to development by the USSR of the KM design, a 550t military ekra-

noplan that underwent trials on the Caspian Sea in 1963.

The story goes that the KM was picked up by Western intelligence satellite systems. But because it was so ahead of its time, intelligence operatives and subsequently the press assumed that it was merely a large seaplane, which they called the Caspian Sea Monster. Bearing in mind that these developments were taking place at the height of the Cold War, such was the secrecy surrounding Russia's ekranoplan projects that Soviet officials forbade even the use of the word ekranoplan in public.

The USSR continued to develop the concept with the most successful vessel being the 125t Orlyonok, which completed service with the Russian Navy in 1992. However, following the collapse of the Soviet Union, large ekranoplan development for military use was abandoned in favour of smaller systems for commercial uses. Of these smaller ekranoplans, the 8 seat Volga-2 and *Amphistar* stand out as the successes and both are still in production. □

the ideal design is one which has the optimal balance of advancement against risk achievable right now". That operator could be civil or military.

The current project is the HoverWing 20 vessel offering a 3t payload but it's anticipated that a 10t payload craft will be a reality within the next ten years.

These vessels are aimed at markets in coastal, inter-island, estuary and major rivers throughout the world, with the main regions being East Asia, the Caribbean, the Persian Gulf and Red Sea, the Gulf of Mexico, the Mediterranean, the Baltic Sea, the Maldives and coastal Indian Ocean. Many of these regions have a desperate need to improve transport effectiveness, which is linked to their economic growth. East Asia and China are particularly good examples.

The ekranoplan market could potentially be as big as the helicopter business, of which Taylor highlighted numerous parallels: a heli-

copter is far less stable than a wing-in-ground effect vehicle, it offers similar point-to-point speed, yet it has secured a niche market worth US\$5 billion a year.

"If wing-in-ground effect vessels [with far greater passenger capacity than even the largest of choppers] were to cost only one-tenth the price of a helicopter then the market could still be worth US\$500 million. Surely this is an incentive for potential players, investors and suppliers to take an interest in the sector."

A prototype technology demonstrator of the HoverWing concept was built and successfully trialled over 3000km in 1997, but the task is "to move from the R&D and concept prototype work that has already been conducted, and put the HoverWing into series production". This challenge has now been taken up by an Indonesian company that has acquired the rights to HoverWing.

The future of WiG still lies in the balance, acknowledged Taylor. "It is surprising

how few people are interested in making billions of dollars." But Hypercraft Associates wants to redress the balance and act as the catalyst that brings together the parties and resources to make it happen. Only time will tell if WiG can rise above the apathy and conservatism with which it is currently blighted.

Nevertheless, several other active projects in the world serve as a note of encouragement: Korea has a

current research programme aimed at regional transport solution. Several projects are active in Russia. In Singapore the Flightship 8 project (also designed by Fischer Flugmechanik) has been resurrected by WigetWorks Pte and in Germany, MTE began trials with its new 8-sea SeaFalcon craft earlier this year, also for Indonesia. A military WiG programme as even been disclosed by Iran. D