The perfect landing craft has to be fast, it has to deliver a high pay- load and it must be able to beach even where other vessels would run aground. To meet all these demands, provider of technology- based solutions QinetiQ, has developed its PACSCAT (Partial Air- Cushion Supported CATamaran) landing craft concept for the UK Ministry of Defence.

Moored in the harbor with the water lapping a round its 30 x 8-meter hull, the vessel looks like nothing more than a rectangular brown and black box. Then the engines start up. The sonorous growl of the two 16-cylinder MTU engines swells and the box begins to move, gliding slowly out of the placid harbor. Then, as soon as it reaches open water, it accelerates and unfurls its full potential. Despite the characteristic catamaran contours, the faster it moves, the more it becomes obvious that this is a semi- hover, catamaran landing craft. The idea is based on a concept developed by John Lewthwaite who was actually looking for ways to enable inland waterways vessels to carry higher payloads whilst also travelling at higher speeds. QinetiQ has now made use of the concept to produce a special landing craft, the PACSCAT, for the British MoD.

Landing craft are military transport vessels. They take vehicles and personnel on board from a larger ship at sea and transport them ashore – and they have hardly changed in appearance since the Second World War. Their task of carrying extremely heavy cargo means that up to now, they have been comparatively slow, reaching only eight knots (around 15kpm) on average, and have had limited maneuvering capabilities. All that is now set to change in response to the UK Ministry of Defence’s new require- ments: the vessel must be faster and more maneuverable than previous landing craft but must still be able to deliver heavy payloads. In addition, it has to be very stable when beached to enable personnel to load and unload it safely.
Training off the Scottish coast: the PACSCAT beaches and remains stable whilst the amphibious vehicles leave the landing craft.

QinetiQ selected extremely experienced partners for the project: Griffon Hoverwork for construction, BMT Nigel Gee for design and BMT Marine Projects for project management support and together they planned, developed and built the new hovercraft-catamaran. The extensive cargo bay can accommodate five amphibious vehicles, a tank or troops. The craft is propelled by twin waterjets powered by two 16-cylinder, Series 4000 high-speed diesels from MTU. Two further engines inflate the hover cushions which allow the vessel to achieve even higher speeds whilst the catamaran hull design lends the PACSCAT the stability it needs on shore. At least, that is how it works in theory.

Faster than expected

After three years of planning and construction, the project moved into its first 100 hours and the speed trials with no problems, and it was fast – so fast that it reached almost 40 knots (74 kph) unladen. The powerful MTU engines deliver the best power-to-weight ratio. That is vital in a pro-

The PACSCAT takes personnel and vehicles on board from the dock landing ship and transports them ashore.

Training with the Royal Marines

Following the speed trials in England, tests continue off the Scottish coast – this time on duty with the Royal Marines. The PACSCAT is given the task of taking cargos of different weights on board and transporting them. The trials start on the beach where its twin hulls give the craft stability in the shallow water. One after the other, five amphibious vehicles roll slowly off the beach into the water and toward the landing craft. Half-submerged and with their headlights still just visible, the vehicles float through the water like crocodiles until they slowly begin to creep up the PACSCAT ramp onto the craft. With all five on board, the flap closes and the vessel casts off. The trials go siastic at the conclusion of the Scottish trials.

The third task is tricky. The PACSCAT has to be transported in a dock landing ship from which it has to disembark in open seas carrying a payload. Dock landing ships transport tropops and equipment to theatres of action but can only dock in a harbor, not on a beach. The job of transporting people and cargo onto unprepared terrain falls to PACSCAT. The ship’s floating dock is open, waiting for the catamaran which advances slowly into the vessel – this is, after all, the first time it has attempted to enter a larger vessel. Then it docks, takes its cargo on board and leaves the other vessel’s hull again. Mission accomplished without difficulty once more. “The trials went off very successfully for us. The PACSCAT was able to demonstrate what it can do with the air-cushion support and the catamaran hulls and it showed where its limits lie. We are really proud of our landing craft,” said Chris Ross enthusiastically at the conclusion of the Scottish trials.

The acid test

But the PACSCAT’s trials are not yet complete. Over now at Plymouth, England, a final tough test still remains to be mastered: the landing craft has to transport a main battle tank, a 62-ton, olive-green monster, the Challenger II. This is the heaviest load that the craft has yet had to carry and it is a real gamble. But here, too, the PACSCAT displays no sign of weakness and moves apparently effortlessly through the English Channel with the colossus on board.

A really successful marathon program of trials. The Royal Marines and the vessel’s manufacturer QinetiQ are both well satisfied: “This technology demonstrator will allow us to arouse interest in the defence and commercial sectors alike,” commented Ross. So far, the PACSCAT has not advanced beyond the trials version but there is great optimism that the vessel will herald a new generation of landing craft. It has effectively demonstrated what it is capable of achieving and has shown that far from being just an oversized box, it represents real change in the world of landing craft. Chris Ross is certain: “This vessel can meet the toughest requirements.”

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A video of a PACSCAT in action

How does it work? – see page 3
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