## Minimum Volume Cockpit kayak incidents

Examples of incidents involving kayaks equipped with an MVC (minimum volume cockpit) are rare simply because these designs are currently a tiny minority of kayaks. An MVC kayak will produce a low Cockpit Intake Test measurement.
The pattern that seems evident from those incidents known to this author, some of which are recounted below, accord with the statements:
An "epic" in a conventional (bulkheaded) kayak becomes a passing incident in one with an MVC.
An "epic" in a kayak equipped with an MVC has all the characteristics of a very serious or fatal incident had the paddler been in a bulkeaded craft.

1) Angelsey 1988
A paddler in F6 to 7 winds and 2 metre waves off North Wales in the U.K. had to sit out the conditions for two hours while a companion went ashore for help. The SAR helicopter came close on two occasions during which the paddler waved his paddle vertically to attract attention. When he was finally spotted he had to exit the kayak in order to be winched aboard the helicopter. The unladen kayak had a hull leak through a damaged area and had taken on possibly 120 litres. Effectively the kayaker was paddling an MVC, two buoyancy blocks held in position at bow and sternand a quantity of air trapped underneath the deck. In this situation the kayak was floating low in the water and was stable in roll and trim. For examples see: Winning 1990, Figs. 7 and 13.

In a conventional kayak with two bulkheads a stern-down or bow-down trim would have developed early on with any leak. Balance would have become progressively more difficult with the kayak locked into a down or upwind course very quickly. For examples see Winning 1990, Figs 33 and 43. With a cockpit leak in a conventional kayak, roll stability would have progressively decreased and a capsize made very likely at an early stage given the conditions.

In Carter 1990, the "Slow Leak" experiment, the test bulkhead kayak with a 6mm hole developed "silly" directional control after only 19 minutes in very light test conditions.

References
Carter (1990) The Slow Leak
http://www.users.on.net/~pcarter/flooding.html
Padwick, N & Atkinson, M. 1988 Incident report and results of subsequent investigations
private publication, Sea Tiger. ~ see Windslicer.co.uk/safety.html

2)"Saved by a Drysuit"
This is described in *Sea Kayaker Deep Trouble* and relates the tale of a paddler swimming to shore and only just making the last small island before the open straight. His survival was due to his drysuit helping him avoid hypothermia but equally, almost certainly, to the design of his kayak. This was a "Puffin" by Nimbus kayaks of Canada. It has an MVC and confluent hull. The kayak's rubber hatch covers were missing and only the hard covers were present. The conditions were rough enough for water to wash over the deck, dribble into the hull and accumulate. The lower a boat gets in this situation the faster the water comes in. The Puffin's confluent hull allowed the water to equalize fore and aft and the trim was maintained so the paddler had directional control until the point where capsize occurred (after the cockpit filled) from where he started swimming. This was the vital point not credited in the account in Sea Kayaker nor in a dramatic reconstruction of the incident for TV. In

the dramatised TV documentary a compartmented hull bulkhead kayak was used by the actor instead of the confluent hull Nimbus 'Puffin' the victim was actually paddling.

In a conventional bulkheaded kayak with leaking hatches, directional control would have been lost at an early stage and the paddler locked into a downwind or upwind course depending on which end became swamped first. The kayaker in this example, had he been in a bulkheaded kayak, would have had to have started swimming sooner, with farther to go and would have missed the last island.

The kayak's buoyancy design contributed equally with his drysuit to his ultimate survival.

Ref: Broze, M., Gronseth, G. (1997) Sea Kayaker Deep Trouble, True Stories and Their Lessons from Sea Kayaker Magazine, ed. C. Cunningham, International Marine / Ragged Mountain Press, pp186

3) Minch crossing

It was a hectic drive to the launch forced by the tide times. The loaded kayaks had been bounced around on the roof rack on the rough roads. A crossing of the Minch on Scotland's West Coast is about 15 (24Km) miles from that point.

The wind picked up to northerly F5 and they were half way across by the time David noticed his kayak was being sluggish to respond. Soon after that he realised his kayak was taking in water from a hull leak somewhere. Making landfall on the Isle of Harris he found that the equipment in the kayak was buoyed up tight against the hatches by the onboard water (D. Hayter pers. comm.). He estimates there were about 10 to 12 UK gallons or 45 to 55 litres of water in the hull.

Despite the strong beam winds, directional control was not compromised because the hull of the Sea Tiger is confluent and the water taken in was able to distribute equally fore and aft and did not change the trim of the kayak.

A conventional design with a hull subdivided by bulkheads would have been directionally, considerably affected by even half that amount of onboard water and a paddler in similar circumstances would have been locked into either an upwind or downwind course depending on the compartment flooded. In a conventional kayak there would have been no choice about the course taken and the consequences for the paddler would have been serious.

4) Swim and tow

The middle aged paddler capsized in a fast tidal stream near the end of a short winter's day. His problems were compounded by the uninflated lifejacket beneath the cagoule he had donned earlier. After some difficulty, once the lifejacket was inflated, he could turn his attention to getting to a nearby shore as re-entry and rolling was not an option for him. Sandy was able to swim to shore across the tidal streams, towing his kayak, drag it up the rocks and was in his sleeping bag warming up by the time an SAR helicopter arrived.

Sandy's kayak was a standard production Sea Tiger with a cockpit volume of 95 litres and a buoyant : non-buoyant ratio of 2.6 to 1. Loaded with camping equipment and righted after capsize the cockpit retained about 15 litres of water. It was the fact that this was a small amount and made no difference to the kayak that enabled Sandy to tow the kayak while swmming. A conventional (double bulkhead) design would have retained 50 or 60 or even more litres making it a significantly heavier burden to tow and a very much less feasable option in the strength-sapping cold January waters of the Corryvreckan on Scotland's West Coast.