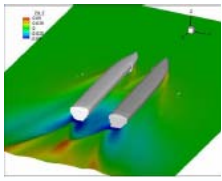


# Full Scale Wake Testing and Performance



## Foil Assisted Vessels including Catamaran Hulls

The vessel trials provide data useful for improvements in hull design that can further reduce wakes and increase fuel efficiency. Wake trials provide data for calibration and validation of near field CFD models and far field wake propagation models.

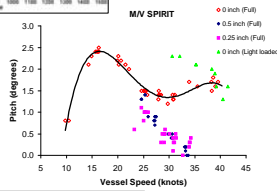
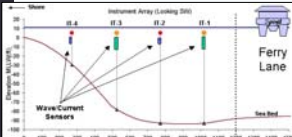


### Condor Express

Analysis of wake data from vessel trials indicated that the foil-assisted *Condor Express*, built by All American Marine Inc. of Bellingham, WA and designed by Teknicraft Inc. of New Zealand, had lower wakes than any vessel with a capacity of 149 passengers. This analysis precipitated the testing of vessels of similar design and construction.

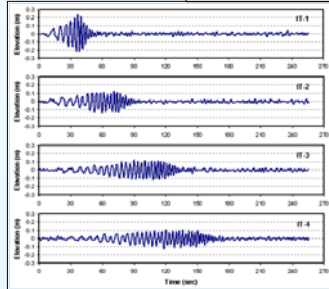


### Spirit Trials 2005



*Spirit* is a foil-assisted vessel also built by All American Marine Inc. which provided an opportunity to conduct in-situ research with a state-of-the-art hull.

*Spirit* was chartered for extensive field trials in Port Orchard reach near Bremerton, WA and impacted within in Rich Passage. *Spirit* was outfitted with instrumentation to measure dynamic draft, heading, position, and speed. A four point wave gauge array provided detailed measurements of the *Spirit* wake transformation from the sailing line. Although *Spirit* wakes were slightly larger than *Condor Express* wakes, deployment of interceptors on *Spirit* reduced the wakes by improving trim. Shore impact studies in Rich Passage indicated that the vessel shows considerable promise as a low-impact POFF alternative.

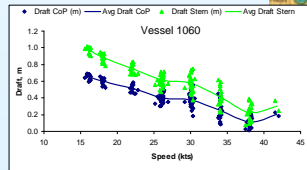


### Ten Sixty Trials, 2006

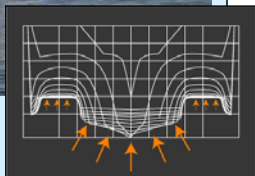
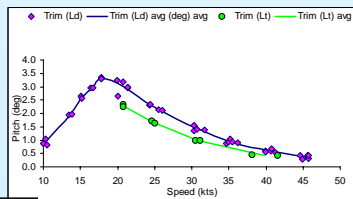
Research tests were conducted in Auckland, New Zealand with the vessel *Ten Sixty* designed by Teknicraft, NZ. The tests provided wake wash and vessel performance data from a catamaran equipped with an adjustable foil.



As the vessel increases in speed, the vessel draft decreases as the foil is forced upward. Foil adjustment helps improve trim, wakes and vessel performance over a broader range of operating speeds.



## Passive Air-Assisted Vessels



Preliminary wake trials were conducted with two M-Hull prototypes designed by the M Ship Company in San Diego in November 2006. The vessels show significant promise for low wake performance at high speeds. It is observed that *Stiletto* produced the highest measured wake energy during its transition from non-planing to planing conditions. However, as vessel speed increased above 25 kts, *Stiletto's* wake was among the lowest in energy among tested vessels.

The team is developing a scope of work and timeline in cooperation with M Ship and University of Iowa IHHR for CFD optimization of the M-hull.

