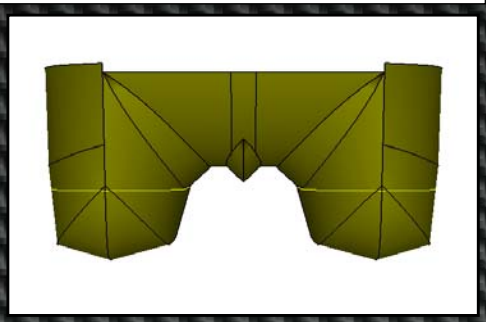
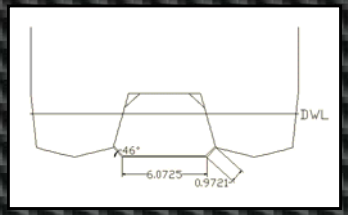
Feasibility Study for a Hydrofoil Retrofit of a Catamaran, Part 2

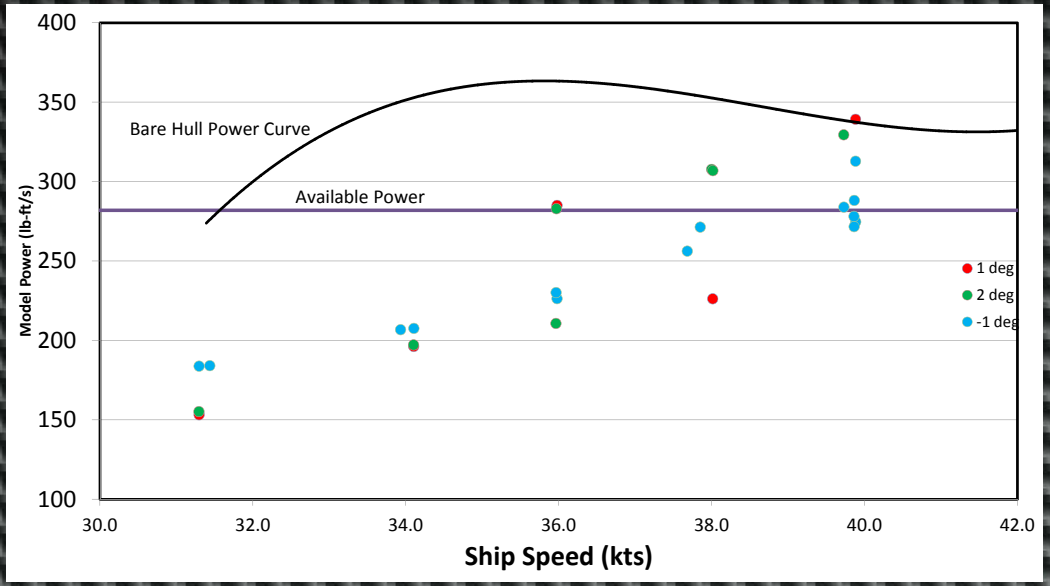
MIDN 1/C C. Graham Tyson
Advisors: William E. Beaver, PE, and Professor Greg White

Typical HYSUCAT	ERB 41
Asymmetrical Hulls	Symmetrical Hulls
High Tunnel Height	Low Tunnel Height
Wide Tunnel Width	Narrower Tunnel Width
High Power	Underpowered





ERB 41 model at scale 40 knots with foil in flat water.



Results

- Available Power derived from full scale trials and top speed, recreated in model testing.
- AoA 1 and 2 degrees (red and green) WRT baseline failed due to foil ventilation.
- AoA -1 degree (blue) successful. 40 knots possible with current powering.

Conclusions

- Current Top Speed of 32 knots
- 40 knots attainable in flat water.
- No performance increase in waves. Tested scale 1 ft and 2 ft regular waves.
- Spray from symmetrical hulls inside tunnel creates non-ideal flow conditions.
- Based on current results, a retrofit is not feasible.

Relevance to the Navy and Coast Guard

This concept is obviously highly relevant to the Navy and Coast Guard. A hydrofoil supported catamaran offers greater top speed, fuel efficiency, seakeeping ability and stability. These boats could be utilized as armed patrol and search and rescue craft. It is also feasible to scale this concept up to create a high-speed littoral combatant.