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M/V CONDOR EXPRESS WAKE WASH MEASUREMENT TRIALS
February 2, 2002

EXECUTIVE SUMMARY

Worldwide ferry traffic has simultaneously increased in both volume and in vessel speed, the resulting negative effects of wake wash on shorelines has become an increasing environmental concern. Consequently, wherever expanded ferry service is contemplated, there is a need to measure the contribution that a specific ferry will make to the wake wash environment.

All American Marine requested that Fox Associates measure the wake wash of a new vessel design, anticipated for use as a ferry in one or more routes. The vessel, M.V. CONDOR EXPRESS, differs from most catamarans in that it's fitted with foils that provide dynamic lift. This feature, dynamic lift, is known to reduce water resistance and therefore reduce the amount of energy that is used to make waves.

The tests were conducted in Bellingham Bay on 22 February 2002, in water depths that are similar to those found in several west coast waterways such as Rich Passage in Puget Sound and the high-speed vessel lanes in San Francisco Bay. Wind conditions were minimal and the investigators were able, using proven computer techniques, to filter out the effect of the wind driven waves from the vessel waves. The vessel was loaded to approximate the weight and weight distribution of an average passenger load for a vessel with a capacity for 149 passengers[1]. The investigators used a procedure that they've used in measuring wake wash on more than 40 vessels in the last ten years, assuring thereby that the results would be comparable with those of other vessels.

[1] 149 passengers is a threshold established by the U.S. Coast Guard for certain features, and CONDOR EXPRESS was compared with other vessels in this category.

The results of these measurements showed that M.V. CONDOR EXPRESS, at the loading of the test day, has exceptionally low wash characteristics, both in height and in energy. Specifically:

- At full speed, 39 knots, CONDOR EXPRESS has a lower wash energy[2] (776 joules/meter of wave front) than any vessel with a capacity of 149 passengers or more tested to date by the investigators, at any service speed.
- At full speed, 39 knots, the wash height is less than 20 cm. and 28% below the threshold established by Washington State Ferries for Rich Passage[2]
- At speeds below 12 knots and above 23 knots, CONDOR EXPRESS meets the standard for operation in Rich Passage.

[2] There is not a universal standard for wake wash height or energy. Washington State Ferries has established a threshold of acceptability for Rich Passage of 2450 joules/meter of wave front and a height of 28 cm.