STABLE FLOATING PLATFORM

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ADVANCED OCEAN ENGINEERING LABORATORY

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The wind/wave channel in the Hydraulics Laboratory has been in use continuously over the quarter in checking out the data acquisition systems and in performing various types of model experiments.

Additional measurements of wave pressure vs. depth have been made and compared with deep and finite depth wave theories. The writing of a technical report on this subject has been undertaken.

A capacitance wave height measuring system and the bi-axial auto collimator for tracking the motions of models have been put into daily use. An alternating flashing light system has been developed to permit the tracking of two targets on a model simultaneously using the one collimator. An 1130 computer program has been written to give heave, surge, and pitch data from the x and y coordinates of the two targets. Trial on-line spectral analyses of wave and motions data have been made using the 1130 computer.

A technical report on the channel, the wave generator, the wave absorber, and the data acquisition systems has been drafted.

Four 1/100 scale models have now been constructed and ballasted to proper weights and center of gravity locations. These models are FLIP, a two-hull 300-foot draft platform, a two-hull 200-foot draft platform, and a three-leg

210-foot draft Sea Legs. All of these models have been tested quite extensively in a qualitative manner to observe the towing characteristics, behavior in waves in a horizontal mode, behavior in waves in a vertical mode, and heading seeking tendencies in waves.

The 1/100 scale FLIP model has been tested extensively using the collimator and there has not been consistent agreement with theory and full scale data taken at sea. A concentrated effort is being made to resolve the problem involving further checking on the wave pressure fields, the collimator system, and the wave height measuring system. Response tests of the other models have been deferred until the cause is found.

Designs of two 1/8 scale models have been completed during the quarter by L. R. Glosten and Associates of Seattle. The first design is a catamaran with a laboratory body at one end supported on a trunion. Cross structures connect the hulls. The hulls and laboratory body are horizontal in the towing mode and the laboratory body is immersed partly in the sea. Achieving the station-keeping mode is a two-step process. First, the hulls are flooded partly to flip them to a vertical attitude. Second, some ballast water is removed to give the laboratory body a desired clearance above the sea. The laboratory body remains horizontal.

The second design is a three-leg platform similar to the Sea Legs concept which has been studied by Glosten for

several years. However, the legs have pivots rather than universal joints as in Sea Legs to guide the legs into the saddles.

The superstructure of the second design remains elevated above the sea. The legs are horizontal in the transit mode and are vertical in the station-keeping mode. Flipping the legs down is a two-step process. First, sea water is admitted to the legs to trim them down where they separate from the saddles and the superstructure is supported from only the trunions. Second, water is transferred to the low ends of the legs to bring them to the vertical.

The construction of 1/8 scale models of both designs has been undertaken during the quarter. The three-leg model is now nearly completed, while the catamaran is still in the early stages of construction. The models are being built by the Marine Physical Laboratory and will be tested in San Diego Bay.