Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Facility documentation measurements in "new" 7-inch high-speed water tunnel G. CLARK, I. NEYALKOV, M. WOSNIK, University of New Hampshire — A small high-speed, variable-pressure water tunnel was relocated from St. Anthony Falls Laboratory (SAFL), U. of MN, to the University of New Hampshire (UNH). The water tunnel was originally designed and constructed at SAFL in the late 1940s for a series of physical model studies for the design of a 60-inch high-speed water tunnel at the Navy's David Taylor Model Basin (now Carderock Division, NSWC). The 1:10 scale model water tunnel initially had a circular cross section with 6 inch I.D. It was tested in many configurations through the 1950s, with different test sections (incl. a free jet) and features such as a gas absorption dome and a two-story tall resorber in the return leg. In the 1980s it was retrofitted with a new test section of 7 inch width/height with fillets, for an octagonal cross section of 47 sq.in. The water tunnel is fitted with an axial flow propeller pump, which at 1500 rpm is capable of producing flow rates of 280 l/s. Based on the original model study data (15 m/s in 6 inch TS), a maximum velocity greater than 9 m/s will be achievable in the current square/octagonal 7-inch test section. The water tunnel has been restored and connected to a compressor and vacuum pump. Preliminary velocity distribution and pressure measurements are presented and compared to the original model study results. Head losses are measured for the various tunnel parts and compared to the original configuration.

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Date submitted: 06 Aug 2008 Electronic form version 1.4