11/7/11

Design and fabrication of the new Shallow Water FOCE system-

Add new constraints here as a lead-in, e.g., beach launch (200lb) , diver deployable/servicable, wave surge, photic zone, etc.

A new approach was directed to the group to make our design for the shallow water version to be as simple to build as possible. Likewise, the basic essential features of flow control, electrical design, connectors, and the control architecture are to be as COTS as possible. The intent of this approach is to allow as many groups as possible to design and build FOCE type systems with a much reduced price of entry. Materials, fasteners, and tools for fabrication need to be readily available without the need for special equipment and training, i.e. build it in an average shop. Watertight housings and circular duct joint parts easily fabricated at a competent machine shop. Electronics as off-the-shelf as possible, likewise software. Control communications have to be chosen appropriate to bandwidth and distances involved. Software may be the most challenging to reduce cost and complexity to properly control a complex system. Functional requirements for a basic FOCE are being developed as of this writing.

The basic mechanical design for the frame is 2”x2” square FRP tubing and ¼” FRP plate which can be cut and drilled with handtools. The box is 3/8” polycarbonate, cut to size with a bandsaw. Polycarbonate is easily drilled and virtually indestructable. The strakes at the joints are ¾” x ¾” UHMW. Fasteners are all Stainless Steel ¼” bolts and sheet metal screws. The enhanced SW mixing sections are 8” diameter flexible ducting. Velcro, worm type plumbing clamps, piano hinges, tie wraps, concrete blocks are also utilized. Most of these parts can be obtained at vendors such as McMaster-Carr.