ABSTRACT

This senior design project is, as the title says, the mathematical modeling of the Stirling liquid cylinder engine, a Fluidyne type of engine, with the purpose of optimizing it, by simulating its operation on a computer and verifying the results with actual measurements in the laboratory.

Experiments were conducted using the systems and facilities of the Laboratories of the Department of Mechanical Engineering of the Cyprus University of Technology. The design of the engine was based on various models by scholars (West, C. D., 1983), (Walker, G., 1980), who worked on this machine in the past and, it was built under the guidance of Dr. Vasilios Messaritis, Assistant Professor, with some modifications in order to improve its performance. The objective is the description of the liquid piston oscillations and the use of these equations for an improved performance of the engine, while at the same time, understanding the operation of the machine, so as to optimize its performance.

Keywords: [Chamber, flow, oscillation, Fluidyne, height, sensor, liquid, cycle, process, equation]