

Development of Real Time Non-Intrusive Load Monitor for Shipboard Fluid Systems

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Since the year 2000, the United States Navy has spent an average of half a billion dollars over the congressionally approved budget for shipbuilding. Additionally, most experts project that in order to meet the Chief of Naval Operation's goal of a 313 ship Navy, the annual ship building budget will have to increase by about two thirds. Exacerbating this problem is the rising cost of maintaining the current inventory of ships. The U.S. Navy has long used a requirements driven maintenance program to reduce the number of total system failures by conducting routine maintenance and inspections whether they are needed or not. In order to combat this problem the Navy will inevitable have to turn to a condition based maintenance system. The Non-Intrusive Load Monitor (NILM) is a system that can greatly enhance the ability to monitor the health of engineering systems while incurring a low acquisition cost and low technology risk.

This research focuses on the development of a real time user interface for the current NILM architecture in order to provide useful system information to an operator. Additionally, this research has shown that the NILM can be used effectively and reliably, to monitor equipment health, recognize and indicate abnormal operating conditions and casualties and provide invaluable information for the training operators, diagnosing problems and troubleshooting. The NILM is a cheap and proven method of monitoring equipment and reducing maintenance costs.