



Society of Naval Architects and Marine Engineers 2009 Annual Meeting and Expo

Title: Modern Laser Scanning Techniques for Marine Vessel Construction and Repair

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Abstract: A problem that has always existed in the construction and modification of vessels is the absence of accurate data with which to work. The actual as-built shape of the vessel from the hull to the layout of internal features such as piping never exactly matches the design prints. The inherent inaccuracy of the build process and the tolerances of the engineering techniques involved mean that there is always a mismatch between design data and reality. This is the case for all engineered products but is made worse in marine applications because of factors such as undocumented modification and the fact the vessel is not there to be measured when modifications are being designed. Overcoming this lack of good available as-built design information is a major cause of cost and delay. Techniques for overcoming these issues have become common practice in the aircraft industry which has the same issues with as-built structures not conforming to their design prints. What has happened in the last decade is that laser scanners have now got the range and accuracy to capture marine sized structures to an accuracy equal to their manufacturing tolerances. Also, there have been software applications developed that cut down the time dramatically to develop 3D models of plant such as piping and valves by recognizing the components that make up the system. Like all evolving technologies there are many different approaches that have been taken to meet the needs of reverse engineering and inspection process. All of the new technologies have their advantages and their disadvantages. Speed and ease of use often need to be balanced against accuracy and the extent to which a process can be validated. The speaker will present examples of the use of laser scanning for both construction and modification studies in marine environments, such as: reverse engineering ship hulls for the application of new parts, engine rooms and fuel tanks.

Keywords: