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Remote liquid target loading system for LANL two-stage gas gun L.L. GIBSON, B. BARTRAM, D.M. DATTELBAUM, S.A. SHEFFIELD, D.B. STAHL, Los Alamos National Lab. — A Remote Liquid Loading System (RLLS) was designed to load high hazard liquid materials into targets for gas-gun driven impact experiments. These high hazard liquids tend to react with confining materials in a short period of time, degrading target assemblies and potentially building up pressure through the evolution of gas in the reactions. Therefore, the ability to load a gas gun target in place immediately prior to firing the gun, provides the most stable and reliable target fielding approach. We present the design and evaluation of a RLLS built for the LANL two-stage gas gun. Targets for the gun are made of PMMA and assembled to form a liquid containment cell with a volume of approximately 25 cc. The compatibility of materials was a major consideration in the design of the system, particularly for its use with highly concentrated hydrogen peroxide. Teflon and 304-stainless steel were the two most compatible materials with the materials to be tested. Teflon valves and tubing, as well as stainless steel tubing, were used to handle the liquid, along with a stainless steel reservoir. Preliminary testing was done to ensure proper flow rate and safety. The system has been used to successfully load 97.5 percent hydrogen peroxide into a target cell just prior to a successful multiple magnetic gauge experiment. TV cameras on the target verified the bubble-free filling operation.

Stephen Sheffield
Los Alamos National Lab.

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