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Bubble Bifurcation in a Vibrated, Closed, Liquid-Filled Cylinder DAYNA OBENAUF, BENJAMIN HALLS, JOHN TORCZYNSKI, Sandia National Laboratories — When subject to certain harmonic oscillations, a large gas bubble at the top of a closed cylinder filled with a viscous liquid will break up, and some of the gas will migrate to the bottom of the cylinder due to Bjerknes forces. At sufficiently large amplitudes, the bubble will fully bifurcate, yielding nearly equal amounts of gas at the top and bottom ends of the cylinder. High-speed imaging is used to capture the dynamics of the bubble breakup, the gas migration, and the resulting two-gas-region system. Several parameters are investigated: oscillation frequency, oscillation acceleration, gas volume fraction, and liquid viscosity. Sandia National Laboratories is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525. This paper describes objective technical results and analysis. Any subjective views or opinions that might be expressed in the paper do not necessarily represent the views of the U.S. Department of Energy or the United States Government. SAND2019-8414 A

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