ABSTRACT

General Atomics (GA) has served as the Inertial Confinement Fusion (ICF) Target Component Fabrication and Technology Development Support contractor for the U.S. Department of Energy since December 30, 1990. This report documents the technical activities of the period October 1, 1998 through September 30, 1999.

During this period, GA and our partner Schafer Corporation were assigned 17 formal tasks in support of the ICF program and its five laboratories. A portion of the effort on these tasks included providing direct "Onsite Support" at Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), and Sandia National Laboratory (SNL). We fabricated and delivered over 1790 hohlraum mandrels and numerous other micromachined components to LLNL, LANL, and SNL. We produced more than 1380 glass and plastic target capsules over a wide range of sizes and designs (plus over 300 near target-quality capsules) for LLNL, LANL, SNL, and University of Rochester/Laboratory for Laser Energetics (UR/LLE). We also delivered various target foils and films for Naval Research Lab (NRL) and UR/LLE in FY99. We fabricated a device to polish NIF-sized beryllium shells and prepared a laboratory for the safe operation of beryllium polishing activities. This report describes these target fabrication activities and the target fabrication and characterization development activities that made the deliveries possible.

During FY99, the GA/Schafer portion of the GA/Schafer-UR/LLE-LANL team effort for design, procurement, installation, and testing of the OMEGA Cryogenic Target System (OCTS) that will field cryogenic targets on OMEGA was completed. All components of the OCTS were procured, fabricated, assembled, tested, and shipped to UR/LLE. Only minor documentation tasks remain to be done in FY00.

The ICF program is anticipating experiments at the OMEGA laser and the National Ignition Facility (NIF) which will require targets containing cryogenic layered D_2 or deuterium-tritium (DT) fuel. We are part of the National Cryogenic Target Program and support experiments at LLNL and LANL to generate and characterize cryogenic layers for these targets. We also contributed cryogenic engineering support and developed concepts for NIF cryogenic targets. This report summarizes and documents the technical progress made on these tasks.