The OMEGA laser at the University of Rochester Laboratory for Laser Energetics (UR/LLE) will begin Inertial Confinement Fusion (ICF) implosion shots on cryogenic targets in 1999. The OMEGA Cryogenic Target System (OCTS) will fill plastic targets to high pressure, cool them down to cryogenic temperatures, layer and characterize the targets, and then transport them to the center of the OMEGA Target Chamber where they are shot. The OCTS is being designed and constructed by General Atomics.

Testing with prototype equipment has demonstrated the technical feasibility of the process, by successfully filling polymer targets with D₂ to 1100 atm, cooling, and cold transport. Based on the prototype testing and a strong emphasis on design simplicity, the cryogenic target process and equipment have changed significantly from the original conceptual design. Equipment has been relocated into one tritium laboratory, the number of process steps has been reduced by process simplification, and the equipment has been optimized from an operational and human factors viewpoint. An entire transfer cryostat system has been eliminated by combining the functions of previously separate subsystems into one cryostat. The main DT fill cryostat was redesigned based on a similar cryostat in use at Los Alamos National Laboratory. The high pressure cryovalves have been replaced with one room temperature valve, reducing the penetrations into the vessel and simplifying maintenance. The high pressure DT cell has been simplified, using an integral actuator that eliminates a separate cryogenic wrench, and reduces the operational steps significantly.

The final design has been completed for all of the equipment, and the components are being assembled at General Atomics for operational testing. The high pressure DT cryostat will be delivered to UR/LLE early in FY99 and the remainder of the target positioning system components will be delivered in mid-FY99.