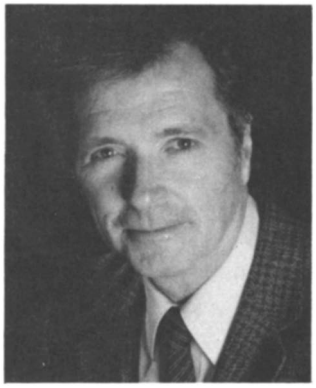
COMMENTS



This special issue contains selected papers from the Eleventh Target Fabrication Specialists' Meeting, held in September 1996 on Orcas Island, Washington. We are indebted to Tom Bernat, Lawrence Livermore National Laboratory, who, as Guest Editor, undertook the task of collecting the manuscripts and organizing their review for this issue. I am confident that after you look this issue over, you will agree that he and the other meeting staff who assisted did an outstanding job.

Fusion Technology (*FT*) has developed a tradition of coverage of target technology for inertial confinement fusion (ICF) and for inertial fusion energy (IFE). In addition to special issues from earlier target fabrication specialists' meetings, a number of individual papers have appeared along with extensive groupings from target sessions in American Nuclear Society topical meetings. Indeed, target fabrication technology represents one of the key areas for present ICF research and for the eventual development of IFE power plants. Present targets are "custom" designed and individually "hand-crafted" to meet the exceedingly close tolerances required for optimal performance in today's experiments at large laser facilities such as NOVA at Los Alamos National Laboratory, OMEGA at the University of Rochester, and GEKKO at Osaka University. As seen from the papers in this issue, the development of such targets, while exceedingly demanding, has been very successful. The next major step will focus on targets designed for the National Ignition Facility (NIF), which will be under construction by this summer. Also, as light- and heavy-ion-beam facilities continue to develop, modified targets designs will be needed for experiments at them.

Present-day, individually hand-crafted, ICF targets each typically cost several thousand U.S. dollars or more. The next challenge, as we move toward IFE power plant operation, will be to develop simple target designs suitable for mass-production methods that produce roughly 120 million targets per plant per year at a cost of only a few tens of cents each. Such target factory operations will have to build on, and extend, experience from precision-microfabrication-manufacturing industries such as integrated circuit manufacture. This will necessitate the development of new methods in a variety of fundamental steps for target production; e.g., a shell formation process is needed that consistently provides a narrow spread of shell sizes, shapes, and wall thicknesses; a coating technique is required to build up 300 to 500 μm of thickness in minutes rather than days, as required for present methods; a new cryogenic deuterium-tritium filling process is needed to minimize filling time and also minimize the tritium inventory in the target factory and in target storage; and fast quality control diagnostics suitable for production line use will be essential for successful operation of the factory.

Development of such "target factory" methods is receiving increasing interest as ICF nears the next goal of breakeven. Unfortunately, a research and development budget for such studies has not yet materialized, but it is only a matter of time before that happens, assuming that the rapid progress currently enjoyed by ICF continues. We look forward to continuing to cover in *FT* this growing and exceedingly important field.

Again, we wish to thank Tom Bernat and his staff for developing the important present issue on this topic. It provides a comprehensive view of the key target research now underway.