PREFACE

SIXTH TOPICAL MEETING ON THE TECHNOLOGY OF FUSION ENERGY

CARL D. HENNING

Lawrence Livermore National Laboratory, Mirror Program Office
P.O. Box 5511, L-644, Livermore, California 94550

The ANS Topical Meetings on the Technology of Fusion Energy have continued to grow in popularity and attendance. This Sixth Topical had 330 papers presented and 415 delegates, including 20 students. There were three days of oral and poster sessions, plus a day tour of the Lawrence Livermore National Laboratory (LLNL). During the first day, a "Town Meeting" was held to give participants a chance to debate the optimum balance between plasma science and technology. The theme of the meeting was "Fusion Breakeven and Beyond," with emphasis on advanced fusion technology and the next generation of devices. In addition to the plenary session, the conference offered a trio of review sessions so that participants could learn of the current status of important experimental programs, including the Tokamak Fusion Test Facility (TFTR) at Princeton Plasma Physics Laboratory (PPPL); the Tandem Mirror Experiment-Upgrade, the Mirror Fusion Test Facility, Nova, and Novette, all at LLNL; the Joint European Torus (JET) at Culham, England; JT-60 at Tokai, Japan; and GEKO-12 at Osaka, Japan.

Despite the impressive progress in fusion, such as the high-ion temperatures in TFTR above 10 keV reported by Furth (PPPL) and the long confinement times in JET (~0.8 s) reported by Wüster, the general mood of the meeting was cautious. The U.S. Department of Energy presidential budget request for FY 86 is $390 million, a substantial reduction from the current FY 85 budget of $443 million. This continues the recent de-emphasis of fusion and energy. Coupled with recent criticisms that the fusion program is on the wrong track, the major conference speakers reacted: The keynote speaker, Ken Fowler (LLNL), stated that "recent budget reductions for magnetic fusion have led to a re-examination of program schedules and objectives. Faced with delays and postponement of major facilities as previously planned, some have called for a near-term focus on science, others have stressed technology." His talk suggested a different focus as the keynote for this conference, namely, the applications of fusion. The talk explored once again the economic implications of a new nuclear age, beginning with improved fission reactors fueled by fusion breeders, then ultimately evolving to reactors based solely on fusion.

Steve Dean (Fusion Power Associates) stated at the final luncheon that "there are the three necessary and sufficient conditions for accelerating the fusion program. We need systematic, publically-understandable progress. We need, urgently, an attractive conceptual reactor design, and we need a level of energy R&D in this country that's commensurate with the problem." Earlier, John Clarke (Office of Fusion Energy) explained that a new program strategy had been formulated to maintain a broad domestic research and development program with emphasis on establishing the scientific and technological base required for fusion energy.

It was an honor and a pleasure to serve as chairman. Special thanks go to the technical program cochairmen, Ralph Moir and Mike Monsler, and to the LLNL staff and others who worked so hard to make the meeting a success.