International Dimensions

The United States is participating in international programs for the development of magnetic fusion. Incentives for international cooperation include the enhancement of progress through the pooling of multidisciplinary expertise and achievement of significant cost reductions in technology development through cost-sharing. In pursuing collaboration, the United States is proceeding so as to enhance National Security in the full sense of the term including energy, economic and defense security. This requires maintenance of sovereignty over our own National fusion program. All international programs are frequently reassessed to assure their continuing value in this sense.

An instance of international cooperation having an especially crucial impact on the MFE Program was the dissemination by the Soviets of the tokamak confinement concept in the 1960's. Knowledge of this innovation altered the entire course of United States fusion research and has led to inestimable savings of program resources.

The fusion development community consists of four primary blocs: the United States, the USSR, Japan, and the European community. There are also two important international agencies that provide an avenue for scientific exchange: the International Energy Agency (IEA) and the International Atomic Energy Agency (IAEA).

Cooperative activities began with what is now the longest standing, most traditional element—personnel exchanges, in which individuals contribute their knowledge and experience in joint discussions with colleagues in other countries. The international dimensions of the MFE Program have since expanded from academically oriented information exchanges to encompass coupled experiments, jointly funded scientific and technology research facilities and plans for multilateral cooperation in the building of the next generation tokamak reactor.

Research enhancements worth more than $100 million to the United States have resulted from international cooperative research in the areas of materials research, superconducting magnet development, plasma wall interactions, upgrade and operation of the Doublet III (D-III) concept definition, and design of the next generation tokamak experiment (International Tokamak Reactor (INTOR)).

Superconducting Magnet Development

The United States, the European Atomic Energy Community, the Japan Atomic Energy Research Institute, and the Swiss Institute for Nuclear Research cooperate under the auspices of the IEA on superconducting magnet development in the Large Coil Task. The International Fusion Superconducting Magnet Test Facility, which the United States planned and constructed in Tennessee in consultation with the other participants at a cost of $40 million, is used in the development of the next generation of superconducting magnets. Each