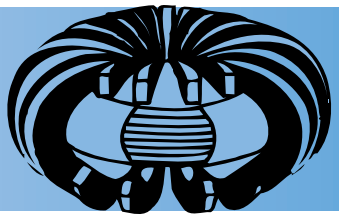
THE U.S. FUSION PROGRAM AS A SOURCE OF TECHNOLOGY TRANSFER

September 1993

U.S. Department of Energy
Office of Energy Research
Office of Fusion Energy



CONTENTS

INTRODUCTION

TECHNOLOGY TRANSFER

TECHNICAL FEATURES

THE BENEFITS OF FUSION

FORGING LINKS WITH INDUSTRY

Under the sponsorship of the U.S. Department of Energy, the magnetic fusion energy program carries out theoretical and experimental research aimed at harnessing the process that powers the sun—nuclear fusion. In the course of this work, which extends from basic science to high technology, fusion researchers integrate and apply scientific and technical knowledge from a broad range of fields.

The innovative solutions that they have developed in addressing the challenges of fusion power have in turn produced new science and technology with applications that benefit many areas beyond the fusion program. While making great strides toward the practical harnessing of fusion energy in electric power plants, which is expected in the first half of the 21st century, the magnetic fusion program has produced ideas, innovations, and techniques that are directly applicable to areas as diverse—and important—as environmental protection and remediation, aerospace, national defense, manufacturing, materials, computing and electronics, health and medicine, and transportation.

Technology transfer to industry is an important part of the mission of the Department of Energy. Mechanisms for technology transfer and other programs through which industry can participate in fusion research are discussed in detail in this document, and examples of technology transfer in which the fusion program was the principal or a significant contributor are described. Also included are examples of current fusion technology development with significant potential for transfer to industry in the immediate future.

The issues addressed in the magnetic fusion program, from basic electromagnetic phenomena to the development of fusion power plants, are issues that have demonstrated their potential for applications across America's technology base. Further advances in the program, culminating in the achievement of fusion power as a clean and abundant energy source, should lead in their turn to attractive dividends along the way.

N. Anne Davies
Associate Director for Fusion Energy
Office of Energy Research
U.S. Department of Energy