PREFACE

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The increasing activity in research and development (R&D) directed at fusion technology is evident from the extensive programs at three recent international meetings: the American Nuclear Society Topical on the Technology of Fusion Energy (New Orleans, Louisiana, June 11–16, 1994), the Third International Symposium on Fusion Nuclear Technology/ISFNT-3 (Los Angeles, California, June 27–July 1, 1994), and the Eighteenth Symposium on Fusion Technology/SOFT '94 (Karlsruhe, Germany, August 22–26, 1994). The R&D programs for the International Thermonuclear Experimental Reactor (ITER), distributed among the home teams of the participating nations, not only has helped to drive this effort but also has served to focus programs worldwide on the key problems related to ITER. Despite this concentrated attention, however, it is apparent from discussions at these meetings that several fundamental issues remain unresolved. One is the perennial question of how to obtain adequate 14-MeV neutron testing of candidate materials. Another is the development of advanced radioactive materials-handling and maintenance techniques capable of providing an adequate operating time ("availability") for a tokamak reactor. These concerns are not new; indeed, both have been the subject of intense study for some years. Yet, little progress has been made because of the absence of dedicated, integrated programs.

The lack of 14-MeV neutron damage studies, in particular, represents a most frustrating problem. There have been numerous studies and several false starts at development of a 14-MeV neutron source facility, with the Fusion Materials Irradiation Facility (FMIF) being the most noted example, where a serious project was begun and then abandoned because of lack of funding. Now there is a renewed impetus to develop an accelerator-target 14-MeV neutron testing source, as well as a more aggressive volume-type source, based on some type of driven fusion device.

Likewise, in the maintenance area, there is a push to develop modular construction methods with integrated robotic servicing units. Of course, the two areas are closely related; if suitable materials can be developed *and* tested for neutron damage, the replacement of damaged walls and other components will be less frequent, and thus reduce, to some extent, the stress on remote radioactive materials handling.

I am sure that most of our readers are well aware of the issues I have outlined here. The point that needs to be made, however, is that the community must now face these problems squarely in order to make crucial decisions affecting the future of fusion energy. *Fusion Technology* (*FT*) could play an important role in this decision process by publishing papers addressed to these issues. Thus, I would like to invite and encourage readers involved in these areas to consider submission of papers that can provide the community with appropriate data, insight, and perspective to make wise decisions. The *FT* staff will be actively seeking such papers in the coming months and would appreciate any suggestions or comments readers may have about possible papers or about these issues themselves. The "Letter to the Editor" department remains an appropriate venue to share general views on fusion development with the *FT* readership. Research results and technical data, of course, should be submitted as regular manuscripts. The *FT* editorial staff is always happy to discuss details and answer questions about submissions with our authors.