

FOREWORD

In 1969, the International Atomic Energy Agency decided to include the topic of fission and corrosion product behaviour in liquid metal fast breeder reactors (LMFBRs) in its programme of specialists meetings. It was apparent at the time that with the advent of experimental fast reactor systems in the USA, the USSR, France and the United Kingdom, the expansion of supporting research programmes and the fragmented nature of information arising from these various activities, it would be beneficial to co-ordinate certain topics at an international level.

Support for this approach was provided by Member States and, against this background, the IAEA has held three international specialists meetings, one in the USSR and two in Germany. The purpose of the meetings was to provide a better understanding of the way various radionuclides behave in operating systems and to provide guidance for the safe development of prototype and eventually commercial systems. To meet these objectives the specialists discussed experiment results, reviewed experimental programmes and identified areas for further work.

As the research programmes developed and more information became available, an introductory review of the topic was published by the IAEA in 1979. Since then the amount of information coming from experimental facilities and operating fast reactors has increased considerably and this document has been written, firstly to keep abreast of current developments and, secondly, to provide a record of the 'state of the art' at the present time.

It is intended that this review will be useful not only to scientists but also to those concerned with design, day-to-day operation of plant, safety and decommissioning. Because of this, the review has been widened to include not only the mass transfer behaviour of the various radionuclides in experimental and operating systems, but also the monitoring of the various species, the methods of measurement and the development of methods to control the buildup of the more important long half-life species in operating plants.

The information used in the review has been taken from open literature sources and in this context Dr. P. Michaille (Commissariat à l'énergie atomique, Cadarache, France) has researched existing documents to provide an up-to-date presentation of the behaviour of the various isotopes in LMFBRs. Technical support and assistance with the production of the document has also been provided by Mr. A.W. Thorley, formerly of the UKAEA, Risley. Mr. V. Arkhipov, of the IAEA's Division of Nuclear Power, was responsible for the final drafting of the report.

EDITORIAL NOTE

In preparing this material for the press, staff of the International Atomic Energy Agency have mounted and paginated the original manuscripts and given some attention to presentation.

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This text was compiled before the recent changes in the former Union of Soviet Socialist Republics.