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***Primary coolant pipe
rupture event in
liquid metal cooled reactors***

*Proceedings of a technical meeting
held in Kalpakkam, India, 13–17 January 2003*



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PRIMARY COOLANT PIPE RUPTURE EVENT IN LIQUID METAL COOLED REACTORS

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FOREWORD

The fast reactor, which can generate electricity and breed additional fissile material for future fuel stocks is a resource that will be needed when economic uranium supplies for the advanced light water reactors or other thermal-spectrum options diminish.

Further, the fast-fission fuel cycle in which material is recycled offers the flexibility needed to contribute decisively towards solving the problem of growing 'spent' fuel inventories by greatly reducing the volume of high level waste that must be disposed of in geological repositories. This is a waste management option that is currently being investigated.

Mainly due to economic and political reasons, fast reactor development has slowed down. However, some Member States (China, India, Japan, the Republic of Korea, and the Russian Federation) continue the development of this technology. Moreover, recent international initiatives (INPRO, Generation IV International Forum) have clearly reaffirmed the importance of fast neutron spectrum systems in ensuring that innovative reactors and fuel cycles will meet sustainability criteria with regard to both natural resources and radioactive waste management.

Through the Nuclear Energy Department's Technical Working Group on Fast Reactors (TWG-FR), the IAEA provides a forum for exchange of information on national programmes, collaborative assessments, knowledge preservation, and cooperative research in areas agreed by the Member States with fast reactor and partitioning and transmutation development programmes (e.g. accelerator driven systems (ADS)). Trends in innovative fast reactor and ADS designs and technology development are periodically summarized in status reports, symposia and seminar proceedings prepared by the IAEA to provide all interested IAEA Member States with balanced and objective information.

The rupture of the primary coolant pipe in a liquid metal cooled fast reactor (both critical and sub-critical) is a topic of major concern for the design of such reactors.

Based on expressed needs of some Member States, and in response to a TWG-FR recommendation, the IAEA has convened the Technical Meeting on Primary Coolant Pipe Rupture Event in Liquid Metal Cooled Reactors. The technical meeting, hosted by the Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam, India, was held 13–17 January 2003.

The IAEA would like to express its appreciation to all the participants, authors of papers, chairpersons, and to the hosts at IGCAR.

The IAEA officer responsible for this publication was A. Stanculescu of the Division of Nuclear Power.

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