

## FOREWORD

One of the primary requirements for nuclear power plants and facilities is to ensure safety and the absence of damage under strong external dynamic loadings such as earthquakes. The designs of liquid metal fast reactors (LMFRs) include systems which operate at low pressure and components which are thin-walled and flexible. These features may be considerably affected by earthquakes. Therefore, the IAEA supports the activities of Member States related to the application of seismic isolation technology to LMFRs in the framework of advanced reactor technology development.

The IAEA organizes meetings and co-ordinated research programmes in which Member States exchange experimental and analytical data. During the last eight years the IAEA sponsored two specialists meetings on the seismic behaviour of LMFRs: reactor block antiseismic design and verification (Bologna, Italy, October 1987) and seismic isolation technology (San Jose, California, March 1992). The participants of the first meeting recommended performing benchmark analyses in order to compare the core computer codes developed in different countries. This proposal was consistent with the conclusion that detailed core seismic analysis was important to ensure fast reactor safety during an earthquake. The International Working Group on Fast Reactors endorsed this proposal at its 23rd annual meeting in April 1990 and after that year the IAEA approved the Co-ordinated Research Programme on Intercomparison of LMFR Seismic Analysis Codes. Two consultancies (October 1990, Vienna, Austria and April 1992, Bergamo, Italy) and one research co-ordination meeting (16–17 November 1993, Vienna, Austria) were dedicated to discussing and reviewing the experimental and analytical data and validating LMFR structural codes.

The codes used for the structural design of the core and reactor internals will be validated in two stages. The first stage is the comparison of the analytical results with the Italian PEC reactor core experiments. In stage two the comparison of Japanese and French reactor core experiments will be considered.

This publication (Volume 1) contains the papers summarizing the validation of the codes on the basis of the Italian reactor core experiments. Two further volumes, containing an analysis of the results from the Japanese and French reactor core experiments and an analysis from the results from the intercomparison of the codes, are being prepared.