

## 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 (LMFR's) include systems which operate at low pressure and include components which are thin-walled and flexible. These features may be considerably affected by earthquakes. Therefore, the International Atomic Energy Agency (IAEA) supports the activities of Member States to apply seismic isolation technology to LMFRs in 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 Agency sponsored two 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 to compare the 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 IAEA Working Group on LMFR endorsed this proposal at its meeting in April 1990 and after that year the Agency approved the Co-ordinated research programme (CRP) on "Intercomparison of LMFR seismic analysis codes". Two consultancies (October 1990, Vienna, Austria and April 1992, Bergamo, Italy) and two Research Coordination Meetings (16-17 November 1993, Vienna, Austria, and 26-28 September 1994, O-arai, PNC, Japan) were dedicated to discussing and reviewing the data and to validating LMFR structural codes.

The codes used for the seismic analysis are verified and improved through benchmark analysis with existing experimental data. Three sets of experimental data for benchmark analysis were provided by Italy, France and Japan, for PEC (Prova Elementi di Combustibile), Rapsodie and Monju mock-ups respectively.

This report (Volume II) contains the papers summarizing the verification of and improvement to the codes on the basis of the French and Japanese data. Volume I: "Validation of the Seismic Analysis Codes Using the Reactor Core Experiments" (IAEA-TECDOC-798) included the Italian PEC reactor data.