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***Verification of analysis methods
for predicting the behaviour of
seismically isolated
nuclear structures***

*Final report of a co-ordinated research project
1996–1999*



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VERIFICATION OF ANALYSIS METHODS FOR PREDICTING THE
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FOREWORD

This report is a summary of the work performed under a co-ordinated research project (CRP) entitled Verification of Analysis Methods for Predicting the Behaviour of Seismically Isolated Nuclear Structures. The project was organized by the IAEA on the recommendation of the IAEA's Technical Working Group on Fast Reactors (TWGFR) and carried out from 1996 to 1999.

One of the primary requirements for nuclear power plants and facilities is to ensure safety and the absence of damage under strong external dynamic loading from, for example, earthquakes. The designs of liquid metal cooled fast reactors (LMFRs) include systems which operate at low pressure and include components which are thin-walled and flexible. These systems and components could be considerably affected by earthquakes in seismic zones. Therefore, the IAEA through its advanced reactor technology development programme supports the activities of Member States to apply seismic isolation technology to LMFRs. The application of this technology to LMFRs and other nuclear plants and related facilities would offer the advantage that standard designs may be safely used in areas with a seismic risk. The technology may also provide a means of seismically upgrading nuclear facilities. Design analyses applied to such critical structures need to be firmly established, and the CRP provided a valuable tool in assessing their reliability.

Ten organizations from India, Italy, Japan, the Republic of Korea, the Russian Federation, the United Kingdom, the United States of America and the European Commission co-operated in this CRP.

This report documents the CRP activities, provides the main results and recommendations and includes the work carried out by the research groups at the participating institutes within the CRP on verification of their analysis methods for predicting the behaviour of seismically isolated nuclear structures.

The IAEA would like to express its appreciation to all who took part in the project and in the preparation of this report. Special thanks go to A. Martelli of the National Agency for New Technology (ENEA), Italy who acted as Chairman throughout the Research Co-ordination Meetings. The IAEA officer responsible for this publication was A. Stanculescu of the Division of Nuclear Power.

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