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Design and Evaluation of Heat Utilization Systems for the High Temperature Engineering Test Reactor

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FOREWORD

The Co-ordinated Research Project (CRP) on "Design and Evaluation of Heat Utilization Systems for the High Temperature Engineering Test Reactor" was established by the IAEA to foster international co-operation in the research and development of applications for nuclear process heat from the high temperature gas cooled reactor (HTGR). This CRP was initiated following the recommendation of the International Working Group on Gas Cooled Reactors (IWGGCR) and was administered jointly by the IAEA's Division of Nuclear Power and the Division of Physics and Chemistry.

The IAEA has co-ordinated an extensive programme addressing the technical development of advanced gas cooled reactor technology. This CRP on the application of high temperature nuclear heat complements other recent CRPs which focused on research on the safety of the HTGR. The technical areas within these CRPs included determining the ability of advanced HTGR designs to dissipate decay heat by natural transport mechanisms, the neutron physics behaviour of the core and on the ability of ceramic coated fuel particles to retain fission products under accident conditions.

In support of this CRP, the Japan Atomic Energy Research Institute provided information on the High Temperature Engineering Test Reactor (HTTR) as the test facility for consideration regarding implementation of a test programme. The IAEA is grateful to Japan for providing this information for the purposes of allowing the Chief Scientific Investigators from Member States with national HTGR programmes the opportunity to evaluate the status of high temperature heat process technologies and identify associated research and development needs for future commercial application.

The following Member State national institutions participated in the CRP:

- Japan Atomic Energy Research Institute (JAERI), Oarai, Japan
- Forschungszentrum Juelich (FZJ), Juelich, Germany
- Russian Research Center Kurchatov Institute, Moscow, Russia
- Institute for Nuclear Energy Technology (INET), Tsinghua University, Beijing, China
- National Atomic Energy Agency of Indonesia (BATAN), Jakarta, Indonesia
- Weizmann Institute of Science, Rehovot, Israel
- General Atomics (GA), San Diego, California, USA

Development of this report was co-ordinated by Messrs. T. Nishihara, S. Shiozawa and M. Ogawa, JAERI, with final editing by Mr. H.L. Brey. The IAEA staff member responsible for this publication was Mr. J. M. Kendall of the Division of Nuclear Power.

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