



# International co-operation: Overview of the IAEA's programmes on advanced reactors

International co-operation has played an important role in the development of reactors since the early 1960's, not only with technical information exchange and co-ordination of research, but also with collaboration in the construction and operation of small experimental reactors to demonstrate technical feasibility.

The IAEA's programme in nuclear power technology promotes technical information exchange between Member States with major development programmes, offers assistance to Member States with an interest in exploratory or research programmes, and publishes reports available to all Member States interested in the current status of development. For countries with liquid-metal, gas-cooled or water-reactor programmes, IAEA activities are co-ordinated by standing committees called the International Working Group on Fast Reactors, the International Working Group on Gas-Cooled Reactors, and the International Working Group on Advanced Technologies for Water-Cooled Reactors. They meet periodically to review the national programmes of their countries, and to advise the IAEA on its technical programmes and activities in the field. This regular review is conducted in an open international forum in which current progress, problems, and operating experience can be frankly discussed. Accordingly, this is a unique opportunity to share the lessons learned, since it brings together programme experts on a truly global basis.

The activities planned by the groups include technical information exchange meetings of several kinds. Small specialists' meetings are convened on selected developmen-

tal areas in which there is a mutual interest. For more general participation, large technical committee meetings or symposia are planned.

Several forms of IAEA support are also available to Member States that do not yet have major programmes. Co-ordinated research programmes are organized which help to establish opportunities for communication and international co-operation between research groups in different countries. Also, technical assistance is arranged for providing expert advice, training, fellowships, and special equipment to developing countries with research programmes.

The IAEA also prepares publications for general and technical readers, including four recent world survey reports on the status and future prospects of specific types of reactors.\*

Advanced nuclear power systems currently under development can provide a practically unlimited energy source capable of greatly forestalling the depletion of the world's natural resources and significantly decreasing the environmental impact of energy generation. These systems include fuel-efficient advanced converter and fast-breeder reactors, heat production reactors for district heating and chemical process plants, and improved versions of reactors presently used for electricity generation. Increased standardization, simplification of system design, and enhanced safety are just some of the characteristics of these advanced nuclear systems.

This issue of the *IAEA Bulletin* contains articles written by experts in the technology of these advanced nuclear systems. The development trends and a few of the potential applications beyond electricity production are described. In order to make these advanced reactors available as soon as possible, their continued development should be fostered.

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Photos page 4:

- ① View of the multi-purpose very high-temperature, gas-cooled reactor in Japan designed for electricity generation and for applications in various industries to supply process heat. (Credit: JAERI)
- ② Model showing the main components inside the containment of the AP-600 advanced light-water reactor in the United States. (Credit: Westinghouse)
- ③ Inside the core of the thorium high-temperature reactor during initial loading in the Federal Republic of Germany. (Credit: Hochtemperatur Reaktorbau GmbH)
- ④ Inside the control room of the Superphénix fast-breeder reactor in France. (Credit: CEA, France)

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\* *Status of Advanced Technology and Design for Water-Cooled Reactors: Light Water Reactors*, IAEA-TECDOC-479 (1988); *Status of Advanced Technology and Design for Water-Cooled Reactors: Heavy Water Reactors*, IAEA-TECDOC-510 (1989); *Status of and Prospects for Gas-Cooled Reactors*, IAEA Technical Reports Series 235 (updated version in print); *Status of Liquid-Metal Cooled Fast-Breeder Reactors*, IAEA Technical Reports Series 246 (1985).