

collection, therefore represents an indispensable technique for power plant design, operation and maintenance engineers to evaluate their efforts in stated objectives, and to discover weaknesses and deficiencies in design and operation practices.

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#### REPORT OF AN IAEA ADVISORY GROUP MEETING, VIENNA, 14–18 APRIL

An Advisory Group met to consider the up-dating and extension of the Recommendations for the Physical Protection of Nuclear Material, produced in 1972. Twenty-seven experts from 11 countries and EURATOM were present.

## Physical Protection of Nuclear Material

Growing concern has been expressed in many countries that nuclear material may one day be used for acts of sabotage or terrorism. Serious attention is therefore being given to the need for States to develop national systems for the physical protection of nuclear materials during use, storage and transport throughout the nuclear fuel cycle which should minimize risks of sabotage or theft.

The revised Recommendations formulated by the Advisory Group include new definitions of the objectives of national systems of physical protection and proposals for minimizing possibilities of unauthorized removal and sabotage to nuclear facilities. The Recommendations also describe administrative or organizational steps to be taken for this purpose and the essential technical requirements of physical protection for various types and locations of nuclear material, e.g., the setting up of protected areas, the use of physical barriers and alarms, the need for security survey, and the need of advance arrangements between the States concerned in case of international transportation, among others.

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#### EIGHTH ANNUAL MEETING OF THE INTERNATIONAL WORKING GROUP ON FAST REACTORS, IAEA, VIENNA, 15–18 APRIL

The meeting was attended by 15 participants from seven countries and two international organizations.

## Fast Breeder Reactor Research

The Eighth Annual Meeting of the International Working Group on Fast Reactors (IWGFR) was attended by representatives from France, Fed. Rep. Germany, Italy, Japan, United Kingdom, Union of Soviet Socialist Republics and the United States of America – countries that have made significant progress in developing the technology and physics of sodium cooled fast reactors and have extensive national programmes in this field – as well as by representatives of the Commission of the European Communities and the IAEA.

The design of fast-reactor power plants is a more difficult task than developing facilities with thermal reactors. Different reactor kinetics and dynamics, a hard neutron spectrum, larger integral doses of fuel and structural material irradiation, higher core temperatures, the use of an essentially novel coolant, and, as a result of all these factors, the additional reliability and safety requirements that are imposed on the planning and operation of sodium cooled fast reactors – all these factors pose problems that can be solved comprehensively

only by countries with a high level of scientific and technical development. The exchange of experience between these countries and their combined efforts in solving the fundamental problems that arise in planning, constructing and operating fast reactors are promoting technical progress and reducing the relative expenditure required for various studies on developing and introducing commercial fast reactors.

For this reason, the meeting concentrated on reviewing and discussing national fast reactor programmes. The situation with regard to planning, constructing and operating fast experimental and demonstration reactors in the countries concerned, the experience accumulated in operating them, the difficulties arising during operation and ways of overcoming them, the search for optimal designs for the power reactors of the future, the body of research aimed at developing liquid metal cooled fast reactors, national plans for work in 1976 on developing fast reactors — these were some of the topics discussed in connection with the national programmes.

The development of power reactors involves a wide range of problems in the fields of nuclear and reactor physics, the thermophysics, chemistry, physics and technology of the cooling system, structural materials and nuclear fuel, the fabrication of reliable fuel elements and operating equipment, reactor monitoring and control, spent fuel reprocessing, the economics of constructing fast power reactors, nuclear safety, etc. The IWGFR, as at previous meetings, therefore paid great attention to the matter of holding international specialists' meetings.

The working group recommended that the IAEA should organize the following IWGFR meetings in 1976:

- (1) *In-Service Inspection and Monitoring*  
(Bensberg, FRG, March 1976).
- (2) *Cavitation in Sodium and Studies of Analogy with Water as Compared to Sodium*  
(Cadarache, France, April 1976).
- (3) *High Temperature Structural Design Technology*  
(United States, May 1976)
- (4) *Aerosol Formation, Vapour Deposits and Sodium Vapour Trapping*  
(France, September–December 1976).

The Group welcomed the IAEA's proposal to hold specialists' meetings on "Fast Reactor Instrumentation" and "Fuel Reprocessing and Recycling Techniques" within the framework of the Agency's programme of working groups in 1976.

After discussing questions of co-ordinating and organizing international conferences on fast reactors, the IWGFR agreed to send representatives to the joint meeting of the American Nuclear Society and the American Institute of Metallurgical Engineers on "Liquid Metal Technology", to be held at Champion, Pennsylvania, U.S.A. from 3–6 May 1976, and recommended that the IAEA should organize an international symposium on the "Design, Construction and Operating Experience of Demonstration Fast Power Reactors" at Bologna, Italy, in April or May 1977.

Recognizing the importance of international co-operation within the framework of IWGFR for preparing surveys, proposals and recommendations concerning sodium cooled fast breeder reactors, the Working Group prepared a number of joint documents with the help of experts from the participating countries, discussed them at the Eighth Annual Meeting and made recommendations on the preparation of subsequent joint documents.