ment and private industry interests as well as power producers and distributors. The company was charged with the responsibility for bringing into operation a series of nuclear power plants in southern Italy and it negotiated an agreement with the World Bank, through CNRN, for a joint study of different nuclear power plant systems and their relative suitability for southern Italy. The study project, known as ENSI, included the selection of a site for a full-scale plant, preparation of invitations for tenders, review of the tenders and an analysis of the economics of the proposed nuclear plant and a comparable conventional plant.

The World Bank had for some years been examining the economic possibilities of nuclear power and had issued a survey report in June 1956. Mr. Corbin Allardice, the World Bank adviser on atomic energy, conducted an enquiry into the possibilities offered by the present state of technical advancement for the economic utilization of nuclear energy in the industrial field. Mr. Allardice's report endorsed the view that the new source of energy must be developed in order to cope with the ever growing demands for power, and indicated Italy and Japan as the countries where a nuclear plant of about 150 mw might be competitive with a conventional plant. The Bank decided upon an examination of certain specific locations, and the first choice was Italy. In view of the special conditions in Italy, to which reference has already been made, the Bank considered that a nuclear plant might be economically competitive in the southern region of the country. The Bank and the Italian Government decided upon a detailed study, and it was agreed that the plant that would be based on this study would be built by SENN.

It is on the basis of the ENSI study report that the site for the plant has been chosen on the river Garigliano and it has been decided that the reactor will be of the boiling water type.

The choice of suitable reactor types for the Italian power programme has been a matter of some interest to CNRN. In a report last year it noted that the prevailing choice seemed largely confined to the two major types: the gas-cooled natural uranium reactor and the pressurized water-cooled enriched uranium reactor. But it pointed out that "to reduce the problem to the choice between two types .... is to over-simplify it" and called upon the Italian nuclear power industry to "strike out towards a larger range of equipment", instead of concentrating on only two types. "This in turn", said the report, "would enable Italy to acquire knowledge essential to a larger development of nuclear energy".

# GUIDE TO POWER REACTORS

"The dissemination of technical and scientific information in concise form is a principal function of the International Atomic Energy Agency in its efforts to contribute to the development of the peaceful uses of atomic energy throughout the world". With these words the IAEA Director General, Mr. Sterling Cole, introduces the Agency's first major scientific publication, a directory of power reactors now in operation or under construction in various parts of the world. * Directories of other types of reactors are also in preparation by the Agency. In his foreword to the volume which has been issued, Mr. Cole says: "Some of the information now presented is issued for the first time; other information is not new but, to the best of my knowledge, extensive data covering so many power reactors presented in a uniform and systematic manner have not been published before."

The purpose of the directory is to present important details of various power projects in such a way as to provide a source of easy reference for anyone interested in the development of the peaceful uses of atomic energy, either at the technical or management level. In selecting reactor projects for inclusion in this volume, the basic criterion has been that they should be in regular operation and be producing useful electric power by the end of 1962.

All data contained in the directory have been either provided or reviewed by the authorities in the Member States concerned, and can, therefore, be considered as the best available at the present time. Thanks to the co-operation of Member States, it has also been possible to include in this volume a number of projects about which no information has hitherto been generally available and many details which have not been included in any previous publication.

## Arrangement of Data

The information has been presented in a uniform manner for all reactors. With a few exceptions, six pages have been devoted to each reactor, the first of which contains general information, reactor physics data and information about the core. The second and third contain sketches of the fuel element or of the fuel element assembly, and of the horizontal and ver-

*Directory of Nuclear Reactors, Vol.1. Power Reactors International Atomic Energy Agency, Vienna 1959 Price US$ 3.50*

tical sections of the reactor. On the fourth page information is grouped under the following heads: fuel element, core heat transfer, control, reactor vessel and over-all dimensions, and fluid flow. The fifth page shows a simplified flow diagram, while the sixth provides information on reflector and shielding, containment and turbo generator. Some information has also been given, when available, on cost estimates and operating staff requirements. Remarks and a bibliography constitute the last part of the description of each reactor.

It has not been attempted to provide in this publication all details that may be needed by specialists. However, there is often a need for all workers in the field to refer to the principal features of various power reactors so as to be able to compare them rapidly. This volume will meet that need and is likely to be a useful source of reference in libraries, scientific establishments and official and industrial organizations. As has been already indicated, one of the chief merits of this publication is that it is more truly international in character and scope and probably more authentic in its data than the directories already in existence.

It is planned to issue periodical supplements to this volume in order to keep it up to date and as complete as possible. The volume is bound in such a way that it may be taken apart easily and placed in a loose-leaf binder. This would facilitate the addition of new information and enable the reader to rearrange the grouping of the reactors according to requirements. In the present arrangement, the reactors are grouped according to the coolant used (e.g. gas cooled, liquid metal cooled, etc.).

## List of Reactors

The following is a list of the reactor projects included in the directory:

*Pressurized Light Water Cooled Power Reactors*

First Atomic Power Station of the USSR
Thermal Reactor BR-3 (Belgium)
Consolidated Edison Thorium Reactor (USA)
Shippingport Atomic Power Station (USA)
Stationary Medium Power Plant - 1 (USA)
Voronezh Atomic Power Station (USSR)
Yankee Atomic Electric Company (USA)

*Boiling Light Water Cooled Power Reactors*

Dresden Nuclear Power Station (USA)
Experimental Boiling Water Reactor (USA)
Elk River Reactor (USA)
Experimental Power Station Kahl/Main (Germany)
Pacific Gas & Electric Plant (USA)
Ulyanovsk Atomic Power Station (USSR)
Urals Atomic Power Station (USSR)
Vallecitos Boiling Water Reactor (USA)

*Heavy Water Cooled Power Reactors*

Carolinas Virginia Tube Reactor (USA)
Nuclear Power Demonstration Station (Canada)
Reactor R-3/ADAM (Sweden)

*Gas Cooled Power Reactors*

Advanced Gas Cooled Reactor (UK)
Berkeley Nuclear Power Station (UK)
Bradwell Nuclear Power Station (UK)
Calder Hall Reactors (UK)
Chapelcross Reactors (UK)
Centrale de Chinon E.D.F.-1 (France)
Centrale de Chinon E.D.F.-2 (France)
Reactor G 1 (France)
Reactor G 2 (G 3) (France)
Hinkley Point Nuclear Power Station (UK)
Hunterston Nuclear Generating Station (UK)
Heavy Water Moderated Gas Cooled Power Reactor (Czechoslovakia)

*Organic Cooled Power Reactors*

Piqua Organic Moderated Reactor (USA)

*Liquid Metal Cooled Power Reactors*

Dounreay Fast Reactor (UK)
Experimental Breeder Reactor 2 (USA)
Enrico Fermi Atomic Power Plant (USA)
Hallam Nuclear Power Facility (USA)
Sodium Reactor Experiment (USA)

Professor Arkady N. Rylov was sworn in as Deputy Director General, Department of Training and Technical Information, by the Director General, on 25 May 1959.

Professor Rylov has had a distinguished scientific and teaching career in the Soviet Union. Before joining IAEA, he was Chief, Division of Training of Engineering and Scientific Specialists, USSR Central Atomic Energy Utilization Board and Professor, Moscow Bauman Technical High School. He is the author of some twenty books and papers on nuclear physics and quantum mechanics.

Professor Rylov succeeds Professor Vladimir Migulin, who returned to his duties at Moscow University after the expiry of his contract with IAEA