

In Tunisia, there is at present little interest amongst those concerned with electrical power generation in the possible utilization of nuclear reactors to meet forecast electricity demands. This is largely due to the ready availability of imported fuel oil from Italy and the possible import of oil, gas or electricity from Algeria. However, interest in the future potential of process heat reactors was noted, but the mission recommended that this be examined in the light of an overall long-term plan of industrial development and power requirement in the area in question and the potential means for meeting this requirement. It is intended to construct a sub-critical assembly and to purchase a Triga Mark II research reactor. Expert advice would be needed for the installation of the assembly and organization of an experimental course.

The only significant electric power supply in the Sudan is in the Khartoum area which is more than adequately provided by the 30 MW Burri power

station. The addition of 10 MW from a station now under construction will permit the retirement of less economical diesel power and provide additional capacity. In addition, the 15 MW Sennar hydroelectric station will be connected with the Burri plant and permit transfer of electricity between these stations. On a long-term basis, the Sudan is favorably endowed with hydroelectric power potential - the estimate is in the order of two million kW. A forecast of power generation, consumption and distribution for 1962 for the Khartoum area has been drawn up, but it is recommended that a more general development plan be prepared for the whole country. The mission further understood that the possibility of an increase in capacity at the Burri plant was under consideration. If the Government decides that this expansion is necessary, and if it so requests, the Agency, in the view of the mission, might assist in conducting a study to determine the potential of nuclear power as a long-term means of meeting this demand.

RADIATION DOSE MEASUREMENTS

About 200 scientists from 28 countries and 5 international organizations met at a symposium on radiation dosimetry held by the International Atomic Energy Agency in Vienna from 7 - 11 June 1960.

The standard techniques and instruments for radiation measurements are well known, and instruments such as the Geiger Mueller counter for the registration of the number of ionizing events produced by radiation are now in extensive use all over the world. Recent developments in atomic energy applications have, however, made it necessary to devise new methods of measurement to meet certain complex and exacting requirements.

One of the most important requirements is, of course, the highest possible versatility which is essential not only for protection against radiation damage, but also for the effective use of radiation in various fields. Among the more specialized and relatively new requirements is the measurement of extremely large radiation doses, such as are employed in industrial processes. Another complicated task is to determine the distribution of different types of radiation when they are mixed. For example, reactors produce a mixture of neutron and gamma radiation and for purposes of radiation protection it is essential not only to measure the total dose but also the amounts of its components.

In his inaugural speech at the symposium, the IAEA Director General, Mr. Sterling Cole, explained that



Opening session of the symposium on radiation dosimetry

radiation dosimetry already covered such a large field that it was not possible to deal with more than a few selected topics at one scientific meeting. The aim of the symposium was not so much the description of a large number of measuring instruments as a discussion of the methods used, with special emphasis on those problems which had become important in the context of recent developments, such as the measurement of mixed or very large doses.

The discussions at the symposium were based on 71 papers presented by leading experts from 20 countries. The topics covered were (1) general survey, (2) problems related to exposure and absorbed dose, (3) new developments in dosimetric instrumentation and methods, (4) dosimetry for mixed neutron-gamma radiation, (5) special methods for the dosimetry of radiation from accelerators or reactors and (6) dosimetry on critical assemblies.

The papers and the discussions not only gave a general view of routine dosimetric procedures but also indicated the progress made in the construction and utilization of ionization chamber dosimeters and scintillators, of photographic dosimeters, of chemical dosimeters, and of dosimeters using the properties of certain solids. It became clear that in the present and anticipated context of atomic energy applications dosimetric equipment must satisfy certain special requirements. In the first place, the measuring range must extend from the low radiation levels of natural, environmental radiation to the high values of unforeseen bursts of radiation. Secondly, in addition to measuring the exposure dose and deriving the absorbed dose from it, it was now necessary to be able to measure the absorbed dose directly in various materials. And thirdly, measuring techniques must be developed for neutrons at all velocities and for mixed neutron-gamma radiation. Several speakers indicated how the relative biological effectiveness of neutron dose could be measured in relation with the gamma radiation, which is frequently associated with neutron radiation.

Closely related to the techniques of measuring mixed radiation is the problem of measuring very high, short accidental bursts of radiation. Scientists from the Oak Ridge National Laboratory of the United States described the progress made in this field. It was, however, pointed out that it would not be possible to assess the results of the new developments on an international basis until common standards had been adopted. The Agency was therefore urged to encourage the international exchange of neutron standards and to assist in international comparison tests.

Mr. Cole, in his closing speech, said the Agency would consider the suggestions made at the symposium and take appropriate action as far as possible. Referring to the need for international comparison in the field of neutron dose measurements, he said the way in which this could be done - whether by circulating standard neutron sources to various laboratories or in any other way - must be decided upon at a later stage.

The following scientists served as chairmen of the different sessions of the symposium: K. K. Aglintsev (Leningrad University, USSR), David E. Barnes (United Kingdom Atomic Energy Authority), Boris Grinberg (Commissariat à l'énergie atomique, France), Bernhard Gross (National Institute of Technology, Brazil), K. Mahmoud (United Nations Scientific Committee on the Effects of Atomic Radiation), W. Minder (Radium Institute, Berne, Switzerland), Karl Z. Morgan (Oak Ridge National Laboratory, USA), and Rolf M. Sievert (Radiophysics Institute, Stockholm, Sweden; Chairman, International Commission on Radiological Protection).



Mr. Douglas Dillon, United States Under-Secretary of State, visited IAEA on 15 July 1960. Mr. Dillon (right) talking to two Deputy Directors General of the Agency, Dr. Henry Seligman (center) and Mr. Hubert de Laboulaye (left)



Dr. Robert Oppenheimer, the eminent physicist (right), having informal talks with the Director General, Mr. Sterling Cole, during a visit to the IAEA headquarters in Vienna. Dr. Oppenheimer represented the Agency at the tenth International Conference on High Energy Physics at Rochester, New York, USA, 25 August - 3 September 1960