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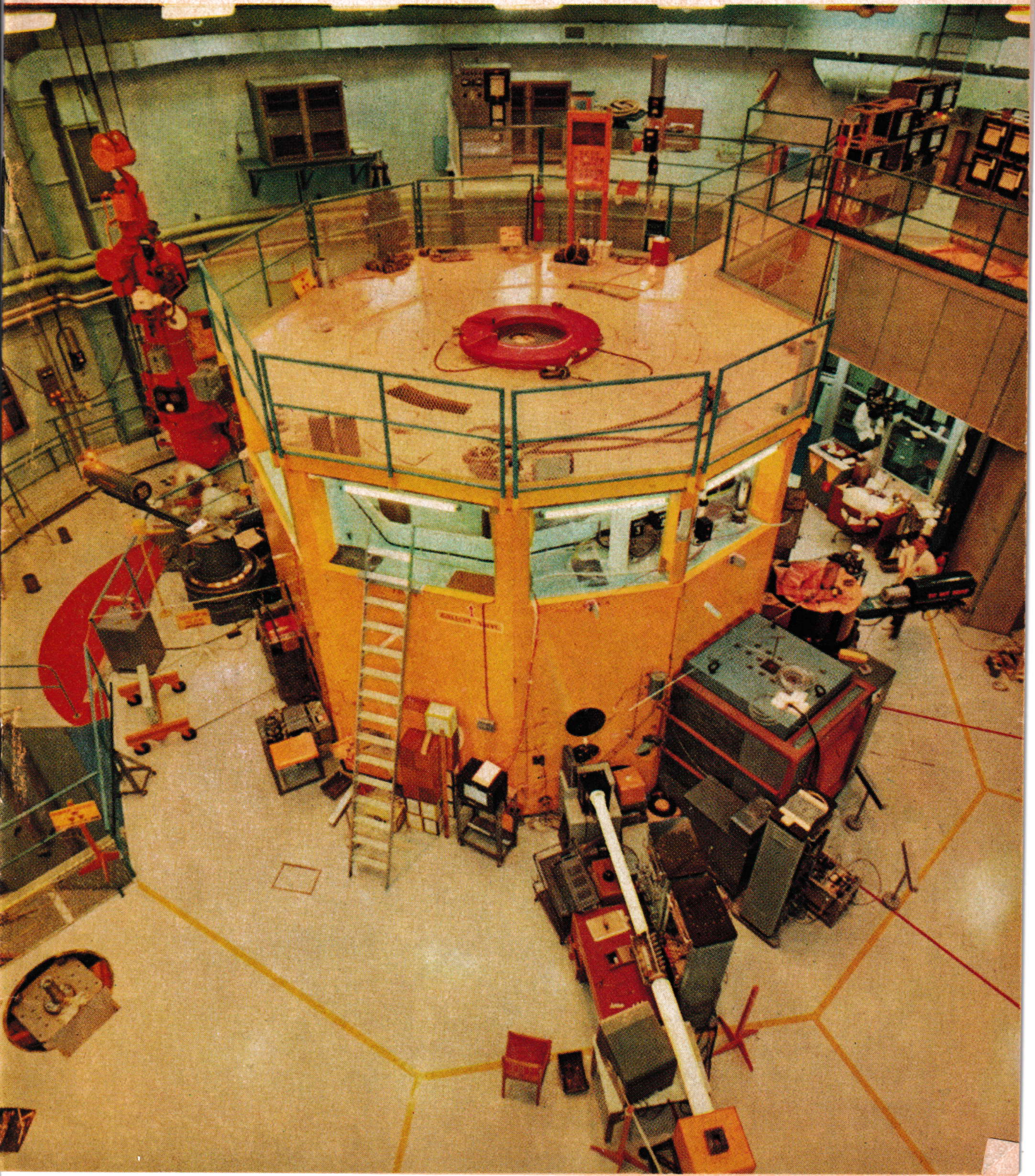
An Introduction to the Work and Facilities of the AUSTRALIAN ATOMIC ENERGY COMMISSION RESEARCH ESTABLISHMENT



View of the A.A.E.C. Research Establishment, at Lucas Heights, N.S.W.

THE AUSTRALIAN ATOMIC ENERGY COMMISSION

Ministerial responsibility for administration of the Atomic Energy Act 1953-58:

The Minister for National Development, the Honourable D. E. Fairbairn, D.F.C., M.P.

Members of the Commission are:

Chairman: Professor J. P. Baxter, C.M.G., O.B.E., B.Sc., Ph.D. (Birm.), F.A.A., A.M.I.Chem.E., F.R.A.C.I., M.I.E.Aust.

Deputy Chairman: Sir Harold Raggatt, C.B.E., D.Sc., F.A.A.

Members: Sir Leslie Martin, C.B.E., Ph.D. (Cantab.), D.Sc. (A.N.U., Melb., Q'land), F.R.S., F.A.A., F.Inst.P.

B. F. Dargan.

M. C. Timbs, B.Ec., A.A.S.A., F.A.I.M. (Executive Member).

THE AUSTRALIAN ATOMIC ENERGY COMMISSION was created in April, 1953, by an Act of Parliament which gave it statutory powers within the constitutional authority of the Commonwealth Government.

Its functions concern:

- development of practical uses of atomic energy for industrial and other purposes;
- scientific research within the Commission, and in universities and other institutions; and
- training of scientists and engineers to meet the needs of nuclear technology in Australia;
- discovery and production of uranium and nuclear materials.

The Head Office of the Commission is at 45 Beach Street, Coogee, N.S.W., and is responsible for the general control of all the Commission's activities. In particular, the Head Office is concerned with policy matters, raw materials (including the Rum Jungle uranium mine and treatment plant), liaison with other Government departments, public and Press relations, extramural and university research on atomic energy, and liaison with international and overseas atomic organisations.

THE RESEARCH ESTABLISHMENT

Director: K. F. Alder, M.Sc., F.I.M., A.M.Aus.I.M.M., A.M.I.R.E.E.(Aust.)

Construction of the Australian Atomic Energy Commission's Research Establishment began on a 160-acre site at Lucas Heights, about 20 miles south of Sydney, in October, 1955. The first stage of the Commission's building program at Lucas Heights is almost completed and has involved a capital investment of more than £11 million. Staff has now reached a total of approximately 1,000. The Establishment consists of a carefully designed complex of buildings and installations containing much equipment for nuclear research unavailable elsewhere in Australia.

Functions

The essential purpose of the Research Establishment is to undertake research into the peaceful uses of atomic energy with special reference to nuclear power and radioactive isotopes; to promote the training and education of scientists and engineers in nuclear science and nuclear engineering; to provide appropriate services in the nuclear field to the universities, industry, science, agriculture, research and medicine; and to build up in Australia a body of people experienced in the complex scientific and technical aspects of atomic energy.

The long-term benefits of this activity will not be realised until nuclear reactors become economic for power generation in Australia, but the short-term benefits are being realised continuously.

Organisation

The Research Establishment is broadly subdivided functionally into four parts:—

1. Under the Associate Director (H.T.G.C.R. Project) are the Divisions of Materials, Physics and Engineering Research, plus an applied mathematics and computing section, which deal with the essential power reactor research program.
2. Under the Associate Director (Support and Associated Research) are the Divisions of Health and Safety, General Nucleonics and Isotopes. The first two Divisions are concerned with research and development in the auxiliary and ancillary fields of atomic energy, primarily in support of the Commission's research program. The Isotope Division supplies radioisotopes for medicine, scientific and industrial purposes by production at the Research Establishment or by importation. It also carries out research and provides advice on applications.
3. Under the Associate Director (Operations) is the Operations Division which is concerned with the construction, operation and maintenance of the complex plant and facilities required to support the reseach program, and with the provision of engineering services to the research staff.
4. Under the Associate Director (Management) are grouped the general administrative functions, library, photographic section, et cetera.

Research Program

The major research program of the Australian Atomic Energy Commission is the investigation of the technical and economic feasibility of a high temperature, carbon dioxide cooled, beryllium oxide moderated power reactor. The concept under investigation at the Research Establishment features a core of the pebble-bed type in which the fuel elements are spheres of beryllium oxide, in which fissile and fertile materials are dispersed in the form of composite particles of plutonium oxide and thorium oxide.

With the effort available it is not practicable for the Commission to consider various alternative reactor designs and fuel cycles in parallel. Therefore, research has been concentrated on one specific design and one fuel cycle. Materials research into the behaviour of beryllium oxide as a reactor material has already reached an advanced stage and has provided important information on the technical performance of an all-ceramic beryllia based fuel.

The initial engineering design study has been based on a plant producing a net electrical output of 200 megawatts. The current research program consists of a feasibility study only and does not embrace the construction of a prototype power reactor. The objective is to develop the most promising reactor system based on the selected materials and to compare the system, both technically and economically, with other reactor designs developed overseas.

MATERIALS DIVISION

The research program of the Division covers the development of materials suitable for use in the H.T.G.C.R. project, and their whole lifetime and ultimate fate. The nuclear reactor core is an environment for materials which demands new requirements not found in any other field of engineering.

The basic problems involved in the development of core materials are fabrication, evaluation in terms of the operating conditions in a reactor (particularly mechanical and thermal properties), behaviour under neutron irradiation, chemical compatibility, permeability to fission products, and the recovery of the valuable constituents of the spent fuel by chemical processing and the disposal of radioactive waste.

Until recently, materials research was carried out on a broad front in an attempt to understand and evaluate the likely behaviour of beryllia and beryllia-based fuels in proposed reactor systems. The scope of recent work has become more restricted and directed towards a more complete study of spherical-shaped fuel elements under the conditions proposed in the the pebble-bed reactor system. This requires basic and applied research over a wide range of subjects.

The work of the Division is divided into four sections:—

Fuel Element Development Section

The Section is responsible for the development of improved fuel element structures, the development of the mechanical characteristics of fuel element materials, and the derivation and co-ordination of data on material properties in a form suitable for use in engineering design work. The Section consists of a Ceramics Group concerned with problems involved in the preparation of suitable fuel structures, and a Mechanical and Thermal Assessment Group which is mainly concerned with the fracture and deformation characteristics of ceramics and their relation to structural and environmental conditions.

Work with the element beryllium is complicated by the fact that this material is very toxic. Consequently, beryllium oxide has to be handled in sealed boxes, working via gloves, or in fume hoods with fast ventilation and absolute filtering of the air extract.

Materials Physics Section

The Materials Physics Section is primarily concerned with research into the structure of solids and the relationship between structure and properties. The two major fields of study are structural changes produced by neutron irradiation and the application of neutron diffraction techniques. A wide range of facilities and equipment for physical examination is available.

The Section consists of five groups: Physical Metallurgy, Irradiation Projects, Irradiation Research, Applied Physics, and Neutron Diffraction, which are engaged in the following projects:

- Studies of irradiation damage in beryllia and beryllia-based fuels. Techniques such as X-ray and neutron diffraction, thermal conductivity, electron microscopy, etc., are used.
- Irradiation damage in other metal oxides including magnesium oxide, aluminium oxide, zinc oxide and other ionic-covalent compounds.
- The structure of metal oxides, e.g. beryllium oxide and magnesium oxide, and of wurtzite compounds, using combined X-ray and neutron diffraction techniques.
- Effect of neutron energy on damage in various materials using neutrons from HIFAR as well as neutrons generated by a proton accelerator.
- The study of lattice dynamics by neutron scattering techniques (elastic and inelastic).

Neutron diffraction projects are undertaken in collaboration with university departments, and these currently include a study of the structure of magnetic materials and the determination of hydrogen positions in various organic molecules. Extensive facilities and equipment are available for this work, including crystal spectrometers, powder spectrometers, and a mechanical monochromator for long wavelength neutron experiments. A variable wavelength triple-axis spectrometer is being obtained.

Fuel Cycle Development Section

The main responsibility of this Section is research and development in chemical processing and reconversion of fuels in the fuel cycles under study, as well as any other chemical engineering studies which might arise in the research program. The Section consists of three groups concerned with process development, chemical engineering and process chemistry.

Development and engineering work at present is devoted mainly to the achievement of low fuel cycle costs. Several facilities have been designed and constructed for the study of different aspects of the fuel cycle. A large engineering bay is available for pilot plant work as well as smaller laboratories. High radiation level handling cells are being specified for use in the program. Present process chemistry work is centred on the chemistry of beryllium, the actinide elements and the major fission products. Facilities include modern radiochemical laboratories and a wide range of specialised equipment.

Materials Chemistry Section

The Section conducts research in solid-state chemistry and physical chemistry related to the application of ceramic materials in reactors. It is concerned with studies such as fission product release from ceramic materials both in and out of reactors; influence of impurities and irradiation on defect structures; chemical reactivity and toxicity of beryllia; volatilisation of beryllium oxide in moist gas; and the measurement of stored energy in irradiated beryllia.

PHYSICS DIVISION

The Physics Division is working as an integral unit of the H.T.G.C.R. project. It has the task of providing accurate reactor and neutron physics information, which, when used with carefully checked calculation methods, will produce adequate reactor core data for the reactor designer. The Division studies the fission process, nuclear properties of heavy elements, and neutron motion in reactors. Its physicists are concerned with the safe and efficient utilisation of neutrons and nuclear materials.

To carry out the physics feasibility study program, the Division is divided into two sections:

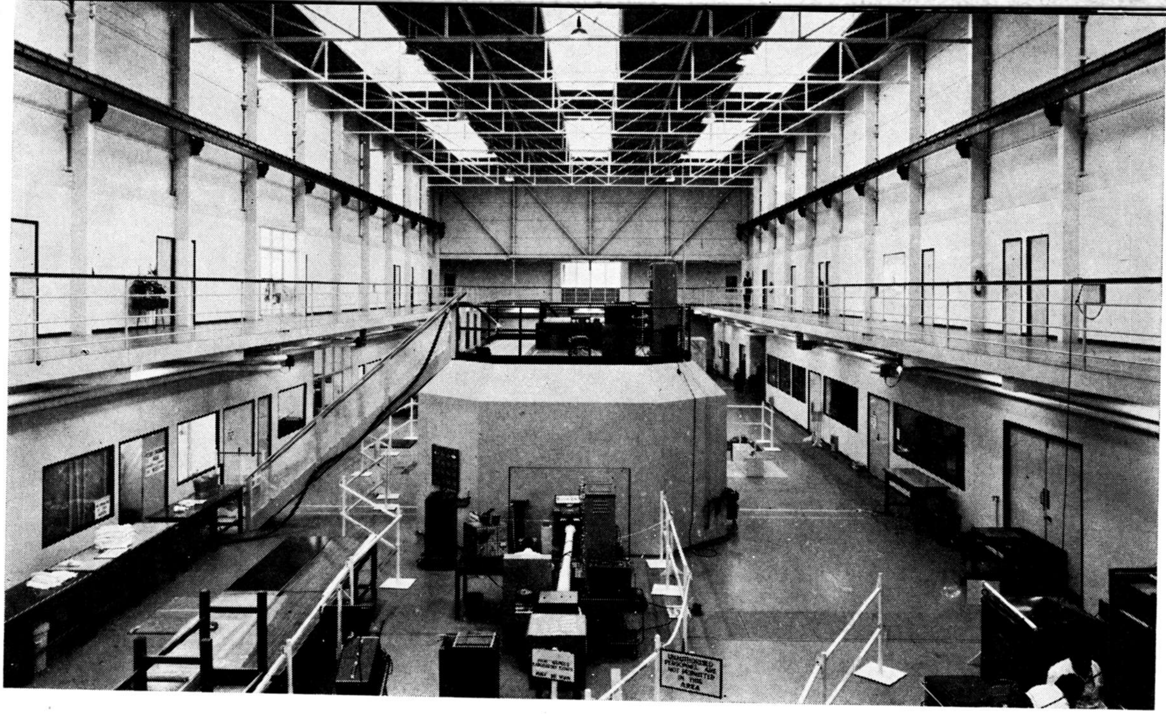
Experimental Physics Section

The main experimental tools of the Experimental Physics Section are a low power research reactor known as "Moata," which has a maximum flux of 10^{11} neutrons per sq. cm. per second, and a maximum heat output of 10 kilowatts, and a 3 MeV positive ion Van de Graaff accelerator.

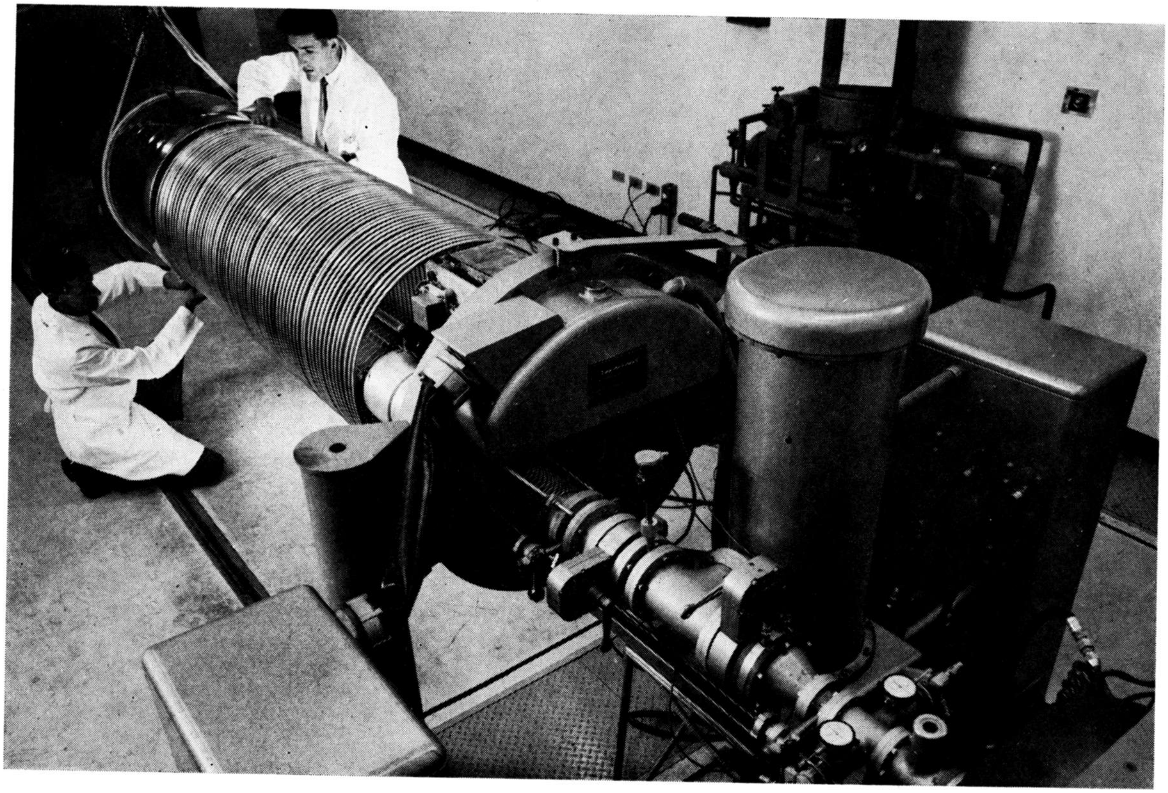
Moata is used as a source of neutrons for such studies as the energy distribution of neutrons, fission, capture and scattering reaction rate in given neutron energy distributions. In addition, the critical mass of a complete reactor is determined by measuring the neutron distribution in a section of the same composition. The positive ion accelerator will provide a monoenergetic source of neutrons, which are used in scattering experiments and in measuring the number of neutrons emitted at fission. The H.T.G.C.R. program presents many complex reactor physics problems.

Theoretical Physics Section

Theoretical reactor physics investigations concentrate on the accuracy of calculations made from various models for the events occurring in a nuclear reactor. Associated studies are concerned with the provision of a satisfactory collection of microscopic nuclear physics data. Nuclear models are examined with a view to correlating and assessing data obtained from experiment and for predicting data not otherwise obtainable. High speed electronic computers are being used to accelerate numerical computations and to automate the prodigious amount of data processing required for reactor studies. Research into refined numerical techniques is essential for this work.



The low power research reactor "Moata", which is used for reactor physics studies.



3 MeV positive ion Van de Graaff accelerator. The accelerator is used for fast neutron physics experiments.

Major commitments of this Section in the H.T.G.C.R. research program are the provision of accurate computation methods with associated sets of data, thoroughly checked against experimentally established standards, and the calculation of burn-up of the plutonium-thorium-beryllia system.

The plutonium-thorium-beryllia system at present under consideration offers a considerable challenge, both in the calculation of the clean core and in the burn-up of the system. The special properties of the beryllia moderator and the resonance structure of the plutonium isotopes have received far less attention in the past than graphite moderator and uranium fuels.

ENGINEERING RESEARCH DIVISION

Research in engineering is the focal point of the H.T.G.C.R. project since it is within this field that most of the problems originate. Consequently, much of the work of the Materials and Physics Divisions arise through the need to supply the Engineering Division with reactor core data and information on the properties and behaviour of materials. The information is then integrated into the theoretical, experimental and design studies of the engineering feasibility of a complete reactor and power conversion system. The Division is organised into two Sections.

Design and Development Section

The main object of this Section is to develop an optimised reactor design which will be reliable and safe in operation and will produce power at a minimum cost.

Because of the high temperatures involved, the unusual materials employed and because of the importance of economics, many unusual and difficult problems are encountered which provide ample scope for the designers' ingenuity. The design, which covers not only the reactor core and its ancillary equipment, but all associated plant (e.g., heat exchangers), also provides plenty of scope for original thinking on the theoretical side in fields such as complex stress analysis, kinetics and transient behaviour, and overall economic optimisation studies.

The Section is divided into four groups: a main Design Group and three groups engaged on analytical work—Nuclear Studies, Core Studies and System Studies Groups.

Experimental Research and Development Section

Many of the theoretical and design studies require experimental support either to test new ideas or to produce new data. The Section operates a large engineering experiment bay with well equipped workshops and laboratories to meet this need. It is responsible for proving and assessing experimentally the prototypes of components and systems and obtaining the basic engineering data required by the H.T.G.C.R. program. The Section consists of five groups, i.e., Heat Transfer and Fluid Flow, Stress and Vibration, Rig Development and Operation, Techniques and Instrumentation, and Technical Assistance.

APPLIED MATHEMATICS AND COMPUTING

The Applied Mathematics and Computing Section comprises three Groups—Computer Operations, Computer Utilisation Research and Programming Support.

As a result of the extensive original power research program, the Commission's computer requirements have expanded rapidly during the past few years. A high-speed IBM 7040-1401 digital computer system with six magnetic tape units was installed recently in an air-conditioned building designed for the purpose.

This computer system is highly flexible and is an essential tool in the examination of possible reactor designs. The main work-load consists of complex nuclear calculations such as those needed to build up a three-dimensional picture of neutron behaviour over the entire volume of a proposed reactor.

ISOTOPE DIVISION

The Isotope Division is responsible for the provision of radioisotopes to science and industry and conducts an advisory and consulting service. It also carries out research and development on new uses of radioisotopes and radiation, and provides facilities for outside organisations to do their own research in these fields. The Division consists of an Isotope Production Section, an Isotope Application Research Section, and an Irradiation Research Section.

Isotope Production Section

The nuclear reactor HIFAR is particularly suitable for the production of radioisotopes, especially those required at a very high specific activity (such as cobalt 60 and iridium 192). Very active radiocobalt is in considerable demand for medical purposes; it is used as a powerful emitter of gamma rays in the treatment of cancer. It is also used in industry as a source of sterilising radiation and, with iridium 192, for industrial radiography.

The Section has special facilities in HIFAR for producing radioisotopes by neutron irradiation. It is also well equipped with remote handling facilities for dispensing, measuring and packing radioisotopes, and incorporating them in chemical compounds. It is also responsible for the development of new methods for the encapsulation, processing and handling of irradiated materials.

Methods are being developed for control of target materials and radiochemical purity of isotopes. A continuous review is made of systems for remote handling of radioisotopes and the design and manufacture of special source changing equipment and containers. In studies of the encapsulation of sources and targets, techniques for high-integrity metallic sealing are developed.

A wide range of processed and unprocessed radioisotopes is already being produced and supplied to users in medicine, research, industry and agriculture in Australia and overseas. The Section has specialised in high specific activity products such as teletherapy cobalt 60 and highly concentrated radiography sources.

Isotope Applications Research Section

The industrial uses of radioisotopes are many and varied. This Section is concerned with the development of techniques for using isotopes in industrial processes, and also carries out applied research in physics and radiochemistry.

The Section has an advisory and consulting service which conducts field investigations with radioisotopes for public utilities and industry in such applications as sand and silt tracing, leak detection, mixing tests, effluent tracing, etc. The Section also carries out research into general techniques such as measurement of stream flow and movement of underground water.

Irradiation Research Section

The Section is engaged on a program of research and development directed towards the use of high intensity radiation, which finds application in the sterilisation of medical and pharmaceutical products, control of insect pests, food preservation, modification of the properties of materials, and promotion of chemical reactions.

For these studies, high intensity gamma radiation is obtained from the spent fuel elements from HIFAR and cobalt 60 produced in the reactor. Another source of radiation for this research is a 1.3 MeV Van de Graaff accelerator, which provides a high intensity electron beam and can also produce X-rays. The Section also has access to neutron irradiation facilities in the reactor HIFAR.

GENERAL NUCLEONICS DIVISION

The work of this Division covers the fields of chemical analysis, fundamental and applied instrumentation, and standards for the measurement of radioactivity. The Division is organised into two Sections:—

Analytical Chemistry Section

The development of atomic energy has set completely new standards for the purity of materials. Chemical analysis must provide basic information on the constituents of materials and aid in understanding their behaviour under special conditions.

In addition to chemical analyses to assist the various research programs, the Analytical Chemistry Section provides a chemical analysis service for operational aspects of the Establishment; for example, chemical control of the reactors HIFAR and Moata; chemical analyses to ensure that liquid effluent discharged is below allowable limits of radioactivity; water analyses; environmental survey and biological analyses; and the testing of a wide range of materials (metals, stores, ores, etc.) for conformity to specification.

Considerable effort is devoted to research and development of new methods of chemical analysis. Owing to the complexity of modern chemical analysis in the field of atomic energy, the Section uses comprehensive instrumentation and many novel methods of chemical analysis. One of these, neutron activation analysis, uses neutrons produced in the reactors for detecting minute concentrations of many elements.

General Physics Section

General Physics Section is responsible for the application of physical and electronic techniques in many phases of the research program as well as the development of new techniques and equipment for the detection and measurement of nuclear radiations. Provision of a maintenance and calibration service for the wide range of electronic and nucleonic instrumentation, including all reactor and nuclear physics instrumentation.

With the rapid trend towards automation in the collection and recording of data in a number of scientific fields, the Section has an active program directed towards the development of digital recording techniques so that experimental data can be fed directly to computers, with a consequent saving in scientific effort. Another field of activity is analogue computation, which has applications in many research problems. Many developments have been made in fast-counting electronics and portable equipment for field use. Collaborative work with other sections in the H.T.G.C.R. project includes the development of instrumentation for tracking and recording the positions of radioisotope labelled pebbles in an experimental pebble-bed.

Radioisotope standards are important to many facets of the research program, and also in the production of radioisotopes of accurately known activities. The work of the Section includes maintenance of standards of radioactivity and the absolute calibration of radioactive sources. Considerable research and development is taking place in radiation detectors and counting techniques, and in special equipment for the accurate standardisation of radioisotopes.

HEALTH AND SAFETY DIVISION

The potential dangers of radiation and radioactive or toxic materials demand close attention to safety in the atomic energy field. This Division provides the necessary medical services and radiological control and carries out research in radiation biology and health physics.

Safety Section

The Safety Section is responsible for both conventional industrial safety and control of radiation hazards. The Section is represented on all Establishment Safety Committees and health surveyors are attached to all areas where dangerous materials or radiation sources are present. These surveyors make routine and special checks to ensure safety. The Section advises on the safe planning of experiments, investigates accidents, and ensures that safety rules are followed. One Group provides a personal dosimeter service to all radiation workers and keeps a complete exposure history of all employees.

The Section also has a Fire and Industrial Safety Group and mans an emergency office which is in contact with the whole site through an extensive warning system. In addition to its own headquarters, the Section has bases in all main buildings.

Particular attention is given to safety training, and courses of varying complexity are arranged for Establishment staff and trainees from other organisations in Australia and overseas.

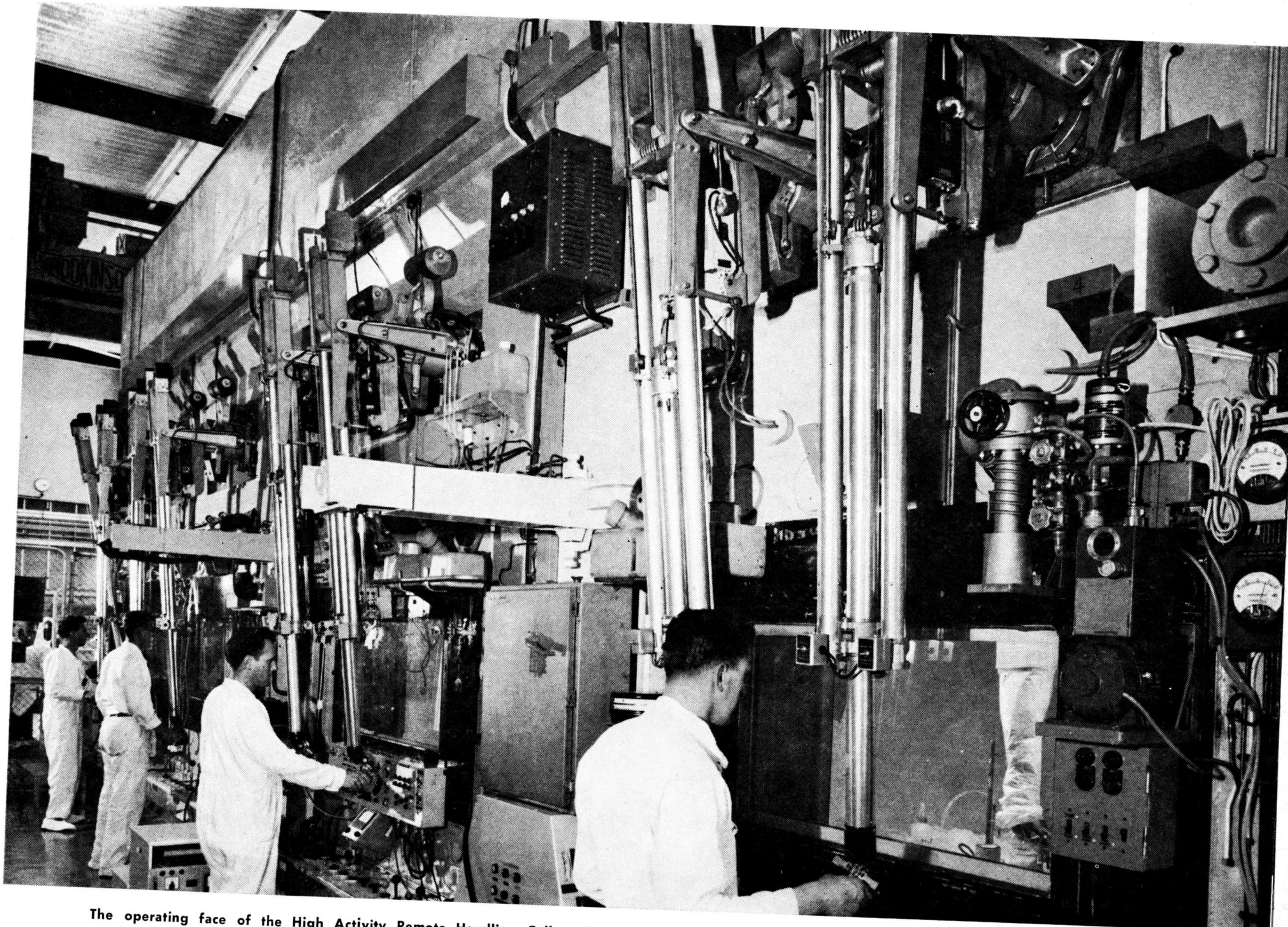
Radiation Biology Research Section

Activities in radiation biology research have been largely concentrated on investigations of acute radiation effects on living matter and the primary mechanisms of radiation damage to cells.

Since beryllium is handled in large quantities at Lucas Heights, the program includes an experimental investigation of the toxicological and carcinogenic properties of this element and its compounds.

Health Physics Research Section

An Environmental Studies Group maintains a continuous radioactivity survey of the geographical environment of the Establishment, and sees that there is no undetected release



The operating face of the High Activity Remote Handling Cells. All irradiated experiments from the high flux regions of the HIFAR reactor are dismantled and examined in these heavily shielded cells, by the use of remotely controlled equipment.

of radioactive material. It also records local meteorological data and conducts research in atmospheric dispersion with particular reference to local conditions.

A Radiation Physics Group is mainly concerned with the application and development of various methods of radiation dosimetry and devises special methods to meet difficult circumstances, for example, where gamma and neutron radiations are mixed. A major facility provided by this group is a steel-shielded whole-body counter, which can measure and identify in the human body very small amounts of most of the likely radioactive contaminants, other than alpha emitters.

A Radiation Medicine Group is responsible for initial and periodic medical examinations of staff, for industrial medical services, and for the medical aspects of radiological safety. The group has a self-contained suite for the treatment of radioactive contamination and associated injuries.

OPERATIONS DIVISION

Operations Division is concerned with the provision, modification, maintenance, and the safe and efficient operation of facilities and services in the Establishment. In order to fulfil its function the Division is divided into three Sections—Reactor Operations, Engineering Services, and Works and Operations.

Reactor Operations Section

Reactor Operations Section is responsible for the operation and maintenance of the materials research reactor HIFAR (High Flux Australian Reactor). HIFAR is used to test reactor materials under simulated operating conditions, to produce neutron beams, to irradiate materials for activation analysis, and to produce radioisotopes.

HIFAR has a peak neutron flux of the order of 1.5×10^{14} neutrons per sq. cm. per second, and is moderated and cooled by heavy water. The fuel is highly enriched uranium 235, in the form of a uranium-aluminium alloy, clad with aluminium and fabricated into thin plates, which are assembled to form fuel elements.

The thermal power developed in the core of the reactor exceeds ten million watts. The heat is removed from the reactor core by heavy water. The heat is transferred to ordinary (light) water in stainless steel heat exchangers. The light water is then pumped to cooling towers, cooled, and returned to the heat exchangers. As the highest temperature in the cooling circuits is only 50°C, no attempt is made to use this heat.

An important function of the Section is the selection and training of the various categories of staff required to operate and maintain nuclear reactors.

Engineering Services Section

Engineering Services Section is responsible for the engineering functions related to the design, manufacture, inspection, installation and commissioning of experimental facilities for the Research Establishment. The Section is concerned also with the design of irradiation rigs for insertion in the reactor.

Comprehensive workshops consist of a main bay and a number of small shops attached to research divisions. A wide range of engineering equipment is available for skilled working of the various materials associated with nuclear research.

Works and Operations Section

Works and Operations Section is responsible for the design, construction, modification, maintenance and operation of buildings and facilities, mechanical and electrical services, radioactive decontamination services, operation of laundry services, and the collection, treatment, storage and disposal of radioactive wastes.

The most important responsibility of this Section is the treatment, storage and disposal of liquid effluents. These are segregated as far as possible at the laboratory buildings, where they are monitored and analysed. Wherever possible, in order to avoid storage of large volumes of liquid effluents on the site, these effluents are passed to an effluent treatment plant to reduce their radioactive or toxic content to levels which enable them to be discharged from the Establishment without causing any hazard to the surroundings or population. These operations are subject to an independent audit and are planned to meet recognised international standards and the approval of the State Health Authorities.

The Commission's high-speed IBM 7040/1401 digital computer.

AUSTRALIAN INSTITUTE OF NUCLEAR SCIENCE AND ENGINEERING

The Australian Institute of Nuclear Science and Engineering has its headquarters at Lucas Heights, next to the Research Establishment. Established jointly by the Australian Atomic Energy Commission and the Australian universities, the Institute's function is to stimulate nuclear research and training in the Australian universities and to make available to the universities the specialised knowledge and nuclear equipment concentrated at Lucas Heights. The universities thus have access, through the Institute, to the reactors HIFAR and Moata, and associated facilities, for investigations in certain branches of engineering, physics, chemistry, metallurgy, biochemistry and other sciences. Through the Institute, the Commission co-operates in a variety of research and training programs, and is kept in touch with nuclear research in progress at the universities.

The Institute's affairs are governed by a Council on which each member organisation is represented. Its operations are financed by the subscriptions of members, grants from the Commonwealth Government, and such funds as can be attracted from industry and other sources.

The Institute building provides studies, a library, a conference room, and a lecture theatre, for university staff, research students and Institute Fellows who are attached to Lucas Heights. Such attachments vary from short visits of one day for consultation with A.A.E.C. officers, to periods of several months for projects requiring extensive use of laboratory facilities and special equipment.

In addition to supporting university work directly associated with the Commission's research program, the Institute assists the research effort in fundamental aspects of nuclear science, such as plasma physics. Studies in this field are proceeding at several of the member universities and are concerned with the eventual controlled release of thermonuclear energy. The Institute also provides special facilities at Lucas Heights for university research workers to use beams of neutrons generated in HIFAR, as a tool in the study of crystal structure and other properties of materials by the technique known as neutron diffraction.

Conferences on various aspects of nuclear science and engineering, in which both the Commission and the universities are interested, are held at Lucas Heights by the Institute, and training courses are arranged when the need arises. Training and research are also carried out through the award of A.I.N.S.E. Post-Doctoral Fellowships and A.I.N.S.E. Post-Graduate Studentships. Through its research and training projects, the Institute facilitates the efficient use of the resources available in Australia for this work, and provides an effective means for advancing the development and application of nuclear knowledge.

AUSTRALIAN SCHOOL OF NUCLEAR TECHNOLOGY

The recent establishment of the Australian School of Nuclear Technology by the Australian Atomic Energy Commission and the University of New South Wales is a significant development in the promotion of formal training in nuclear technology and related topics. The School is controlled by a Board nominated by the Commission, the University of New South Wales and A.I.N.S.E.

The School will offer courses of varying levels and duration on the following topics: the science and technology of nuclear reactors; the production and application of radioisotopes; radiological safety and health physics; siting and hazards evaluation of nuclear plants, and training for potential nuclear power station staff.

The activities of the School will be complementary to existing courses at Australian universities. Lecturers will be drawn from the A.A.E.C. and University of New South Wales staff, as well as from other universities, research organisations, industry and learned societies. The School will use the facilities of both the A.A.E.C. Research Establishment and the University of New South Wales.

Located at the A.A.E.C. Research Establishment, Lucas Heights, the School will be open to students from Australia and overseas. Enrolments are expected from A.A.E.C. staff, universities, electricity authorities, industry, and atomic energy organisations in South-east Asia, New Zealand and elsewhere. Residential accommodation with all amenities will be available to students.

HIFAR reactor and associated laboratories. The laboratories house post-irradiation facilities, spent fuel element cropping pond and shielded spent fuel storage area. Also shown on the left is the Isotope Handling Laboratory.

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